



THE RAMCO CEMENTS LIMITED

(formerly Madras Cements Ltd.)

Corporate Office:

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Tel: +91 44 2847 8666 Fax: +91 44 2847 8676
Website: www.ramcocements.in
Corporate Identity Number: L26941TN1957PLC003566

Ref: RCL/RRN/EC-MVP/03/2017

Date: 24th April 2017

To

The Director

Ministry of Environment, Forest & Climate Change
IA Division, Indira Paryavaran Bhawan,
Jor Bagh Road,
New Delhi 110 003.

Respected Sir,

Sub: Environmental Clearance for Melavenkateswarapuram Limestone Mine Expansion of production capacity from 0.101 Million TPA to 0.50 Million TPA (0.72 Million TPA ROM) of M/s. The Ramco Cements Limited in lease area of 98.62 Ha located in Pudur, Nadukattur and Sennayampatti Villages, Vilathikulam Taluk, Thoothukudi District, Tamil Nadu State - Additional documents submission – reg.

Ref: 1) TOR from MoEF & CC Vide Letter No. J-11015/136/2013-IA.II (M), dated on 9th Sep, 2013, 12th June, 2015 & 19th Sep, 2015.
2) Letter from MOEF & CC dated 4th May 2016, 4th Oct 2016 and 10th Jan 2017 asking for Additional details.

We, **M/s. The Ramco Cements Limited – TRCL** (Erstwhile Madras Cements Ltd) is operating Melavenkateswarapuram limestone mine (MV Puram) of capacity 0.101 MTPA located in Pudur, Nadukattur and Sennayampatti villages, Vilathikulam Taluk, Thoothukudi District, Tamilnadu State.

TOR for expansion of limestone production from 0.101 MTPA to 0.50 MTPA (0.72 Million TPA ROM) in the lease area of 103.53 Ha issued by MOEF & CC, New Delhi, vide their letter No. J-11015/136/2013-IA.II (M) dated 9th September 2013. In the meantime during lease renewal, lease area was reduced from 103.53 Ha to 98.62 Ha. Hence, amendment in TOR was obtained Vide Letter No. J-11015/136/2013-IA.II (M), dated on 12th June, 2015 and extension of validity of TOR also obtained Vide Letter No. J-11015/136/2013-IA.II (M), dated on 19th Sep, 2015 from MOEF&CC.

As per EIA notification of September 2006, Draft EIA/EMP report for the enhanced production capacity was prepared in conformity with the conditions laid down in TOR and the generic pro-forma prescribed by MOEF&CC and was subjected to public hearing / Consultation Process on 25.02.2016 through The District Collector and The District Environmental Engineer, TNPCB, Thoothukudi.

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Final EIA/EMP report incorporating the public hearing proceedings was prepared for the above said subjected project and submitted in online portal of MOEF&CC towards getting Environmental clearance on 13th April 2016.

After submission of Final EIA/EMP report through online, additional details like approved mining plan copy, latest certified EC compliance report were sought by MoEF & CC vide letter referred (2) above. The approved mine plan copy was already uploaded online. The final EIA/EMP report after including the latest certified EC compliance report (Annexure – 9 , page A-46), No forest land certificate (Annexure -16, page A-105), Certified Peafowl conservation plan (Annexure -17, page A-106) along with latest documents are being submitted now as additional documents for perusal.

We request you to kindly accept the proposal for Environmental Clearance and accord the same at the earliest.

Thanking you,

Yours faithfully,

For The Ramco Cements Limited



M. SRINIVASAN

President (Mfg.)

Encls: as stated above.

FINAL EIA / EMP REPORT **FOR** **MELAVENKATESWARAPURAM** **LIMESTONE MINE**

(EXTENT– 98.62 HA)

(PRODUCTION - FROM 0.101MTPA TO 0.50 MTPA (0.72 MTPA OF ROM))

Villages – Pudur, Nadukattur & Sennayampatti, Taluk – Vilathikulam,

District – Thoothukudi, State – Tamil Nadu



Creative Engineers & Consultants

NABET ACCREDITED, NABL ACCREDITED TESTING LABORATORY &

ISO 9001: 2008 CERTIFIED COMPANY

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APRIL - 2017



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PROJECT PROPONENT DECLARATION

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

We, **M/s. The Ramco Cements Limited** received TOR under EIA Notification, 2006 from MoEF&CC vide their letter No. J-11015/136/2013-IA.II (M) dated 9th September 2013 for Melavenkateswarapuram Limestone Mine located in Sennayampatti, Pudur & Nadukattur villages, Vilathikulam Taluk, Thoothukudi District, Tamilnadu State, to increase the production from 0.101 MTPA to 0.50 MTPA (0.72 MTPA of ROM) in the lease area of 103.54 Ha, Subsequently, Amendment in ToR also obtained from MoEF vide their letter No. J-11015/136/2013-IA.II (M) dated 12th June, 2015 for the revised lease area of 98.62 Ha for the above said project due to reduction of Mine lease area during lease renewal.

We have entrusted the EIA Study to **M/s. Creative Engineers & Consultants (CEC)**, Chennai, who have been provisionally accredited by the National Accreditation Board for Education & Training (NABET), Quality Council of India for empanelment of EIA Consultants vide its 33rd AC Meeting for Re-Accreditation held on 26th Nov 2014, Continuation of Accreditation Certificate after Reaccreditation Assessment was issued on 17.04.15 and listed under serial No. 27 in the NABET list of Accredited Organizations Revised on 07.11.2016.

The Environmental Impact Assessment (EIA) & Environmental Management Plan (EMP) Report have been prepared as per the generic structure proposed in EIA Notification 2006. The Awarded TOR is also incorporated in the EIA Report.

For M/s. The Ramco Cements Limited

Authorized Signatory

Date : 24.04.2017

Place : Chennai



CREATIVE ENGINEERS & CONSULTANTS

(ISO 9001:2008 CERTIFIED COMPANY
GOVT. REG. DEPARTMENT OF INDUSTRIES AND COMMERCE - GOTT - 01661
NABL ACCREDITED TESTING LABORATORY)

EIA Consultant Undertaking

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

Creative Engineers & Consultants (CEC) is an ISO 9001-2008 certified company with NABL accredited testing Laboratory, and also NABET accredited Category – A environment consultancy organization for preparing EIA/EMP reports for the sectors Mining, Power plant, Cement plant & Mineral Beneficiation including pelletisation.

M/s. The Ramco Cements Limited received TOR under EIA Notification, 2006 from MOEF vide their letter No. J-11015/136/2013-IA.II(M) dated 9th September 2013 for their Melavenkateswarapuram Limestone mine located in Sennayampatti, Pudur & Nadukattur villages, Vilathikulam Taluk, Thoothukudi District, Tamilnadu state, to increase the production from 0.101MTPA to 0.50 MTPA (0.72MTPA of ROM) in the lease area of 103.53 Ha. Subsequently, Amendment in the TOR also obtained from MOEF vide their letter No. J-11015/136/2013-IA.II(M) dated 12th June, 2015 for the revised lease area of 98.62 Ha for the above said project due to reduction of Mine lease area during lease renewal. Extension for validity of amended TOR also obtained vide J-11015/136/2013-IA.II (M) dated 17.09.2015.

The work of undertaking field studies and preparation of EIA / EMP report, has been assigned to **M/S. Creative Engineers & Consultants (CEC), Chennai** by the project proponent. CEC has been provisionally accredited by the National Accreditation Board for Education & Training (NABET), Quality Council of India for empanelment of EIA Consultants vide its 33rd AC Meeting for Re-Accreditation held on 26th Nov 2014, Continuation of Accreditation Certificate after Reaccreditation Assessment was issued on 17.04.15 and listed under serial No. 27 of List of Accredited Organizations Revised on 07.11.2016.

The Awarded TORs are complied with and incorporated in the EIA Report and submitted.

This report is based on the information and data obtained from records, data provided by project proponent and carried out during the field study by CEC. The data generated and given in the EIA/EMP Report are factually correct. The sample analysis are carried out through CEC's laboratory.

(P.Giri)

Chief Executive & EIA Coordinator

Creative Engineers & Consultants

9/4b, Bharathwajar Street, East Tambaram, Chennai – 600 059.

Ph : 22395170, 9444133619, fax : 91-44-22396643.

e-mail : cecgiri@yahoo.com, web : www.creativeengineers.co.in

Declaration by Experts contributing to the EIA for MELAVENKATESWARAPURAM LIMESTONE MINE EXPANSION. (EXTENT – 98.62 HA.) OF M/S THE RAMCO CEMENTS LTD.

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

EIA Coordinator:

Name: P.Giri

Signature & Date:

Period of involvement: April 2013 onwards

Contact information: 09444133619, 044-22395170

Functional Area Experts:

S. No.	Functional Areas	Name of the expert/s	Signature
1	AP	P.Giri	
2	WP	B.V.S.Gurunadha Rao,	
3	SHW	P.Giri	
4	SE	K.Nanaji	
5	EB	S.Saravanan	
6	HG	M.S.Jayaram	
7	GEO	M.S.Jayaram	
8	AQ	V.Sivaranjani	
9	NV	P.Giri	
10	LU	N.Radhakrishnan	
11	RH	P.P.Unny	

Declaration by the Head of the Accredited Consultant Organization

I, **P.Giri**, hereby, confirm that the above mentioned experts prepared the EIA for **MELAVENKATESWARAPURAM LIMESTONE MINE EXPANSION. (EXTENT – 98.62 HA.) OF M/S THE RAMCO CEMENTS LTD.** I also confirm that I shall be fully accountable for any mis-leading information mentioned in this statement.

Signature:

Name: P.Giri

Designation: Chief Executive

Name of the EIA Consultant Organization: Creative Engineers & Consultants, Chennai – 59

NABET Certificate No. & Issue Date: letter dated April 22, 2013

CONTENTS

<u>CHAPTER NO</u>	<u>PARTICULARS</u>	<u>PAGE NO</u>
I	INTRODUCTION	1-1
II	PROJECT DESCRIPTION	2-1
III	EXISTING ENVIRONMENTAL SCENARIO	3-1
IV	ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES	4-1
V	ANALYSIS OF ALTERNATIVES	5-1
VI	ENVIRONMENTAL MONITORING PROGRAMME	6-1
VII	ADDITIONAL STUDIES	7-1
VIII	PROJECT BENEFITS	8-1
IX	ENVIRONMENTAL MANAGEMENT PLAN	9-1
X	SUMMARY & CONCLUSION	10-1
XI	DISCLOSURE OF CONSULTANTS ENGAGED	11-1
	PROFORMA FOR ENVIRONMENTAL APPRAISAL OF MINING PROJECTS	
	ANNEXURES	A - 1

LIST OF FIGURES

<u>FIGURE NO</u>	<u>PARTICULARS</u>	<u>PAGE NO</u>
1.1	LOCATION PLAN	1-6
1.2	LEASE PLAN	1-7
1.3	SATELLITE IMAGERY SHOWING CORNER CO- ORDINATES OF THE LEASE AREA	1-8
2.1	GEOLOGICAL PLAN	2-4
2.2	GEOLOGICAL CROSS SECTION	2-5
2.3	SURFACE PLAN	2-8
2.4	MINE POSITION – END OF SCHEME PERIOD	2-12
2.5	CONCEPTUAL PLAN	2-16
2.6	CONCEPTUAL CROSS SECTION – WESTERN BLOCK	2-17
3.1	INDEX PLAN	3-3
3.2	POPULATION BREAKUP - BUFFER ZONE	3-6
3.3	LITERACY LEVEL - BUFFER ZONE	3-6
3.4	SC, ST AND OTHER POPULATION – BUFFER ZONE	3-6
3.5	OCCUPATIONAL STRUCTURE IN THE BUFFER ZONE	3-6
3.6	LOCATION OF MICRO METEOROLOGICAL STATION	3-41
3.7	AVERAGE WIND ROSE	3-42
3.8	AMBIENT AIR QUALITY STUDY STATIONS	3-44

<u>FIGURE NO</u>	<u>PARTICULARS</u>	<u>PAGE NO</u>
3.9	AMBIENT AIR QUALITY- PM ₁₀ , PM _{2.5} , SO ₂ , NO ₂	3-47
3.10	LOCATION OF WATER SAMPLING STATIONS	3-49
3.11	LOCATION OF NOISE SAMPLING STATIONS	3-53
3.12	NOISE LEVEL DATA	3-54
3.13	LOCATION OF SOIL SAMPLING STATIONS	3-56
3.14	REMOTE SENSING SATELLITE IMAGE OF MV PURAM & ITS ENVIRON	3-68
3.15	LANDUSE MAP OF 10 KM RADIAL BUFFER AROUND MV PURAM LIMESTONE ML AREA	3-75
3.16	DRAINAGE PATTERN OF CORE & BUFFER ZONE	3-90
3.17	WATER TABLE CONTOUR MAP	3-91
3.18	WATER LEVEL –MV PURAM OBSERVATION BORE WELL	3-92
4.1	ISOPLETH OF GLC PREDICTION FOR PM ₁₀	4-10
4.2	WATER BALANCE DIAGRAM	4-12
4.3	SURFACE RUN OFF MANAGEMENT	4-15
4.4	SCHEMATIC SKETCH OF THE PROPOSED RECHARGE POND CUM SHAFT	4-22
4.5A -B	RESULT OF THE BLAST MONITORING REPORT	4-28 & 29
4.6	MINE CLOSURE PLAN	4-32
6.1	ORGANISATIONAL CHART	6-4

LIST OF TABLES

<u>TABLE NO</u>	<u>PARTICULARS</u>	<u>PAGE- NO</u>
3.1	POPULATION BREAKUP & LITERACY LEVEL WITHIN THE BUFFER ZONE AS PER 2011 CENSUS	3-7
3.2	OCCUPATIONAL STRUCTURE WITHIN THE BUFFER ZONE AS PER 2011 CENSUS	3-9
3.3	EDUCATIONAL FACILITIES AND CBO'S WITH IN THE STUDY AREA	3-13
3.4	MEDICAL FACILITIES WITHIN THE STUDY AREA	3-15
3.5	OTHER INFRASTRUCTURAL FACILITIES AVAILABLE IN THE STUDY AREA	3-17
3.6	VILLAGE WISE LAND USE PATTERN AVAILABLE IN THE STUDY AREA	3-19
3.7	TABLE SHOWING THE DETAILS OF DISEASES OBSERVED IN THE PHC PANDALGUDI	3-34
3.8	METEOROLOGICAL DATA	3-40
3.9	AMBIENT AIR QUALITY DATA	3-46
3.10	WATER QUALITY DATA	3-51
3.11	AMBIENT NOISE LEVEL IN THE STUDY AREA	3-54
3.12	SOIL QUALITY DATA	3-57

<u>TABLE NO</u>	<u>PARTICULARS</u>	<u>PAGE- NO</u>
3.13	LIST OF FLORA IN STUDY AREA	3-59
3.14	LIST OF FAUNA IN STUDY AREA	3-66
3.15	LAND USE CATEGORIES WITHIN THE CORE ZONE AND THEIR SPATIAL EXTENT	3-87
4.1	CONCENTRATIONS OF PM ₁₀ AFTER PROJECT IMPLEMENTATION	4-11
4.2	MAIN SOURCES OF NOISE	4-23
4.3	IMPACT OF NOISE LEVELS	4-23
4.4	BUDGET FOR INTERVENTION OF SCHEDULE - I SPECIES (<i>Pavo cristatus</i>)	4-41
4.5	CSR ACTIVITIES CARRIED OUT BY TRCL	4-45
4.6	MISCELLANEOUS CSR ACTIVITIES	4-46
4.7	CSR ACTIVITIES UNDER MELAVENKALESWARAPURAM LIMESTONE MINE LEASE	4-47
4.8	ANNUAL BUDGET FOR SOCIO-ECONOMIC WORKS	4-53
6.1	NATIONAL AMBIENT AIR QUALITY STANDARDS	6-6
6.2	NOISE LEVEL STANDARDS	6-8
6.3	ENVIRONMENTAL CONTROL COST	6-10

LIST OF ANNEXURES

<u>ANNEXTURE NO</u>	<u>PARTICULARS</u>	<u>PAGE NO</u>
1	MINE LEASE RENEWAL	A-1
2	COPY OF PRESENT MODIFIED MINING SCHEME APPROVAL LETTER	A-10
3	ENVIRONMENTAL CLEARANCE FROM MOEF & CC FOR EXPANSION OF M.V. PURAM LIMESTONE MINE	A-12
4	TOR FOR MELAVENKATESWARAPURAM LIMESTONE MINE LEASE AREA - 103.53 HA	A-16
5	AMENDED TOR FOR MELAVENKATESWARAPURAM LIMESTONE MINE, LEASE AREA – 98.62 HA	A-23
5A	EXTENSION FOR VALIDITY OF TOR FOR MELAVENKATESWARAPURAM LIMESTONE MINE, LEASE AREA – 98.62 HA	A-25
6	CONSENT ORDER FROM TNPCB	A-27
7	COPY OF EXPLOSIVE LICENSE	A-31
8	ENVIRONMENTAL STATEMENT FORM	A-41
9	CERTIFIED COMPLIANCE FOR THE EC OBTAINED FROM MOEF & CC	A-46
10	APPLICATION TO PWD FOR GROUND WATER	A-53
11	COMPLIANCE STATUS FOR CONSENT TO OPERATE ORDER OF TNPCB	A-58
12	MICRO-METEOROLOGICAL DATA	A-60
13	AMBIENT AIR QUALITY DATA	A-63



14	REPORT OF MEDICAL EXAMINATION IN “FORM O”	A-69
15	MINUTES OF PUBLIC HEARING	A-79
16	NO FOREST LAND CERTIFICATE FROM TAMIL NADU FOREST DEPARTMENT	A-105
17	CERTIFIED PEAFOWL CONSERVATION PLAN	A-106

CHAPTER – I

INTRODUCTION

1.1 GENERAL:

M/s The Ramco Cements Limited – TRCL (Erstwhile Madras Cements Ltd.,) a flag ship company of Ramco Group of Industries in southern India, has diversified industrial products like textiles, information technology, asbestos, etc. besides cement. This Rs.6200/- crores group has achieved international recognition for its quality products and services, with good brand name acceptable to the consumers.

M/s. TRCL has cement units in Tamil Nadu, Andhra Pradesh and Karnataka States. Limestone needs of these plants are mostly met by nearby captive limestone mines.

The project proponent has good entrepreneurial, financial and technical competency gained over more than 5 decades, to develop and operate cement plants, limestone mines, etc. as can be seen from its past track record of successful and profitable operation of its cement plants.

M/s. TRCL is having its corporate office in Chennai, Tamil Nadu and Registered office in Rajapalayam, Tamilnadu. TRCL is presently producing 14.45 MTPA cement from its different cement units situated in Tamilnadu, Andhra Pradesh and Karnataka.

M/s. The Ramco Cements Limited (TRCL) is operating a cement plant with 2.0 MTPA capacity at Ramasamyraja Nagar in Virudhunagar District of Tamil Nadu.

The raw material for this cement plant is met from the following mines:

- Melavenkateswarapuram mines (M.V.Puram)
- Pandalgudi
- Maravarperungudi
- Sivalarpatti

The Limestone from Sivalarpatti and Pandalgudi deposits is marginally above cement grade and the Maravarperungudi and Melavenkateswarapuram deposits are of low grade. In order to meet the quantitative and qualitative requirements, all the four mines are operated simultaneously.

Melavenkateswarapuram limestone mine is in operation since year 1985 and is presently worked at a planned capacity of 0.101 MTPA.

However due to quality constraint in the limestone of the region, the limestone consumption in the cement plant has increased. To meet this additional requirement, now it is proposed to expand the mine production capacity from Melavenkateswarapuram limestone mine from the present 0.101 MTPA to 0.50 MTPA Capacity (0.726 MTPA of ROM).

Under the above circumstances TRCL has initiated action towards obtaining environmental clearance for this expansion project.

1.2 STATUS OF LEGISLATORY APPROVALS:

1.2.1 MINING LEASE:

Initially mining lease was granted for the area of 103.53 Ha for a period of 5 years vide G.O.Ms.No.1033 dated 28.07.1982 and the lease deed was executed on 29.07.1983. Subsequently, the same lease was extended for periods of 20 years from 29.07.1983 vide G.O.Ms.No.497 dated 23.03.1988 and lease deed for the same was executed on 23.03.1988. The mining lease is valid upto 28.07.2003 and the renewal application applied vide our letter dated 22.07.2002. The same was renewed vide G.O. (Ms).No.168 dated 17.11.2014 for a period of 20 years (from 29.07.2003 to 28.07.2023) for an area of 98.62 Ha as against the earlier granted lease area of 103.53 Ha (for which renewal was sought), after excluding 4.905 Ha of land comprising 0.275 Ha of poramboke land and 4.63 Ha of patta dry land (**Refer Annexure - 1**)

As per MMDR Amendment Act, 2015 the Mining Lease is valid up to 28.07.2033. [Clause 8A(3) & 8A (5)]

1.2.2 DETAILS OF MINING PLAN/SCHEME OF MINING APPROVALS:

- Initial mining scheme approved vide Indian Bureau of Mines approval No. TN/VOC/LST/Ms-32-MDS dated 01.08.1997 valid up to 2001.
- Mining plan for renewal of mining lease approval no TN/TTK/MP/LST/1438-SZ vide Indian Bureau of mines letter dated 18.02.2003 for the block period of 2003-2008.
- Mining Scheme and progressive mine closure plan for the period 2008-2013 approved vide IBM letter no. TN/TTK/LST/MS-484-SZ dated 26.09.2008.
- Scheme Of Mining and Progressive Mine Closure Plan for the scheme period 2013-2014 to 2017-2018 for the enhanced limestone production capacity of 0.50 MTPA approved vide IBM letter no TN/TKD/LST/MS-808-SZ/714 dated 06.06.2013. However, because of change in Extent, Modified Mine plan was prepared for 98.62 Ha and the same was approved vide Letter TN/TKD/MP/LST-1949MDS dated 20.05.2015. (**Annexure – 2**).

1.2.3. DETAILS OF ENVIRONMENTAL CLEARANCE:

Environmental Clearance obtained from Ministry of Environment & Forest vide their letter No-J-11015/6/99-IA-II(M) dated 22.11.1999 for Melavenkateswarapuram mines expansion from 1,01,500 TPA from the 103.53 ha lease area of 4,06,300 TPA involving additional lease area of 150.10 ha. (i.e. 1, 01,500 TPA from 103.53 ha of Melavenkateswarapuram lease area and additional 3, 04,800 TPA from Sivalarpatti Mines of 150.10 Ha) **(Annexure – 3)**

Subsequently, amended EC for Sivalarpatti limestone mine expansion from 0.304 MTPA to 0.69 MTPA was obtained from MOEF&CC vide letter No. J-11015/192/2005-IA.II(M) dated 02.02.2006.

EC for expansion of Melavenkateswarapuram limestone mines from 1, 01,500 TPA to 0.50 MTPA for the lease area of 103.53 ha was initially applied. The TOR for the same was obtained vide J-11015/136/2013-IA.II (M) dated 09.09.2013 **(Refer Annexure – 4)**. Due to the reduction in lease area from 103.53 Ha to 98.62 Ha during the lease renewal, the lessee has applied for amendment in the TOR for the revised extent of 98.62 Ha and hence the revised feasibility report and Terms of Reference is also submitted as per MOEF&CC requirement. Then the amendment in TOR for the reduced Mine lease area of 98.62 Ha was obtained vide J-11015/136/2013-IA.II (M) dated 12.06.2015 **(Annexure - 5)** and extension for validity of amended TOR also obtained vide J-11015/136/2013-IA.II (M) dated 17.09.2015, which is extended upto 08.09.2016 **(Annexure – 5 A)**.

1.2.4 OTHER APPROVALS:

- Consent order from TNPCB which is Valid upto 31.03.2017 **(Annexure – 6)**. Further renewal applied.
- Copy of explosive license.**(Annexure – 7)**
- Environmental Statement Form-V **(Annexure – 8)**
- Latest Certified compliance for the EC obtained from MOEF& CC – Regional office vide letter no. EP/12.1/173/TN/0590 dated 12.04.2017. **(Annexure – 9)**
- Although this block comes under safe zone, application to PWD is already made for Ground Water Clearance **(Annexure - 10)**
- Compliance status for consent to operate order of TNPCB **(Annexure - 11)**
- No Forest Land Certificate from Forest Department **(Annexure – 16)**
- Certified Pea fowl conservation plan **(Annexure – 17)**

1.3 PURPOSE OF THIS REPORT:

As per MOEF&CC notification, it is mandatory for expansion and modernization of existing projects or activities to obtain environmental clearance. As already mentioned, there is a proposal to increase the production in this lease area from 0.101MTPA to 0.50 MTPA (0.726MTPA of ROM). Under above circumstances, proponent has initiated action towards obtaining environmental clearance.

TOR for this project has been conveyed by MOEF&CC, New Delhi, vide their letter No. J-11015/136/2013-IA.II(M) dated 9th September 2013 as per **Annexure -4** and amendment in the TOR for reduction of Mine lease area from 103.53 Ha to 98.62 ha was obtained vide J-11015/136/2013-IA.II(M) dated 12.06.2015, given in **Annexure – 5**. And extension for validity of amended TOR also obtained vide J-11015/136/2013-IA.II (M) dated 17.09.2015, which is extended upto 08.09.2016 and given in **Annexure – 5 A**. Compliance report of the TOR is given vide **Enclosure – 1.1** at the end of Chapter - I.

The work of undertaking detailed studies and preparation of EIA / EMP report has been assigned to **M/s. Creative Engineers & Consultants (CEC), Chennai-59** by the project proponent. Existing environmental data and other data collection for the project has been undertaken by CEC for **winter season (Dec 2013 – Feb 2014)**.

Draft EIA/EMP report for the enhanced production capacity was prepared in conformity with the conditions laid down in TOR and the generic pro-forma prescribed by MOEF&CC in their notification of September 2006. As mandated and indicated above, the following salient features are covered in the report.

- Introduction
- Project Description
- Existing Environmental Status of the project area (Core zone) and the surrounding 10Km radius (buffer zone) from the periphery of the project with regard to air, water quality, soil status, noise& vibration levels, Socio economic, health environment, flora, fauna, land use, etc.
- Anticipated impacts and mitigation measures on various environmental parameters like Air, Noise, Water including, geo hydrological aspects, Land environment, Biological environment, Socio-economic environment, waste management.
- Environmental monitoring programme on post expansion basis.
- Additional studies including public consultation, Risk Assessment and Disaster Management plan, Natural resource conservation, R& R Action plan etc.

- Project Benefits
- Summary and Conclusion

The draft EIA/EMP report was subjected to public hearing / Consultation Process on 25.02.2016 at T.R.Subbaraj Kalyana Mahal, Paralachi Road, Pudur, Villathikulam Taluk, Thoothukudi District through District Collector -Thoothukudi, District Environmental Engineer - Tamil Nadu Pollution Control Board along with the representatives from M/s. The Ramco Cements Limited, the consultants, press fraternity and the public after following mandatory procedures.

This **Final EIA/EMP report is prepared incorporating the public hearing proceedings.** The elaborate details of public hearing along with proceedings and minutes of Public Hearing are furnished in **Para 7.1 in Chapter-VII and Annexure - 15.**

1.4 LOCATION OF THE PROJECT:

Melavenkateswarapuram mining lease is located in Pudur, Nadukattur, and Sennayampatti villages, Vilathikulam Taluk, Thoothukudi District, Tamilnadu State. The mining lease area is mostly private Patta land owned by the lessee. The mine site is at a distance of 0.50 km East of Pudur – Melavenkateswarapuram road. Melarunachalapuram Village is at a distance of 1.0 km to the North of this area. The area lies in Survey of India Toposheet No.58 K / 3 between coordinates Latitude N9⁰ 17 31.5 - N9⁰ 18 08.1 and Longitude E78⁰ 09 48.7 - E78⁰ 11 04.0.

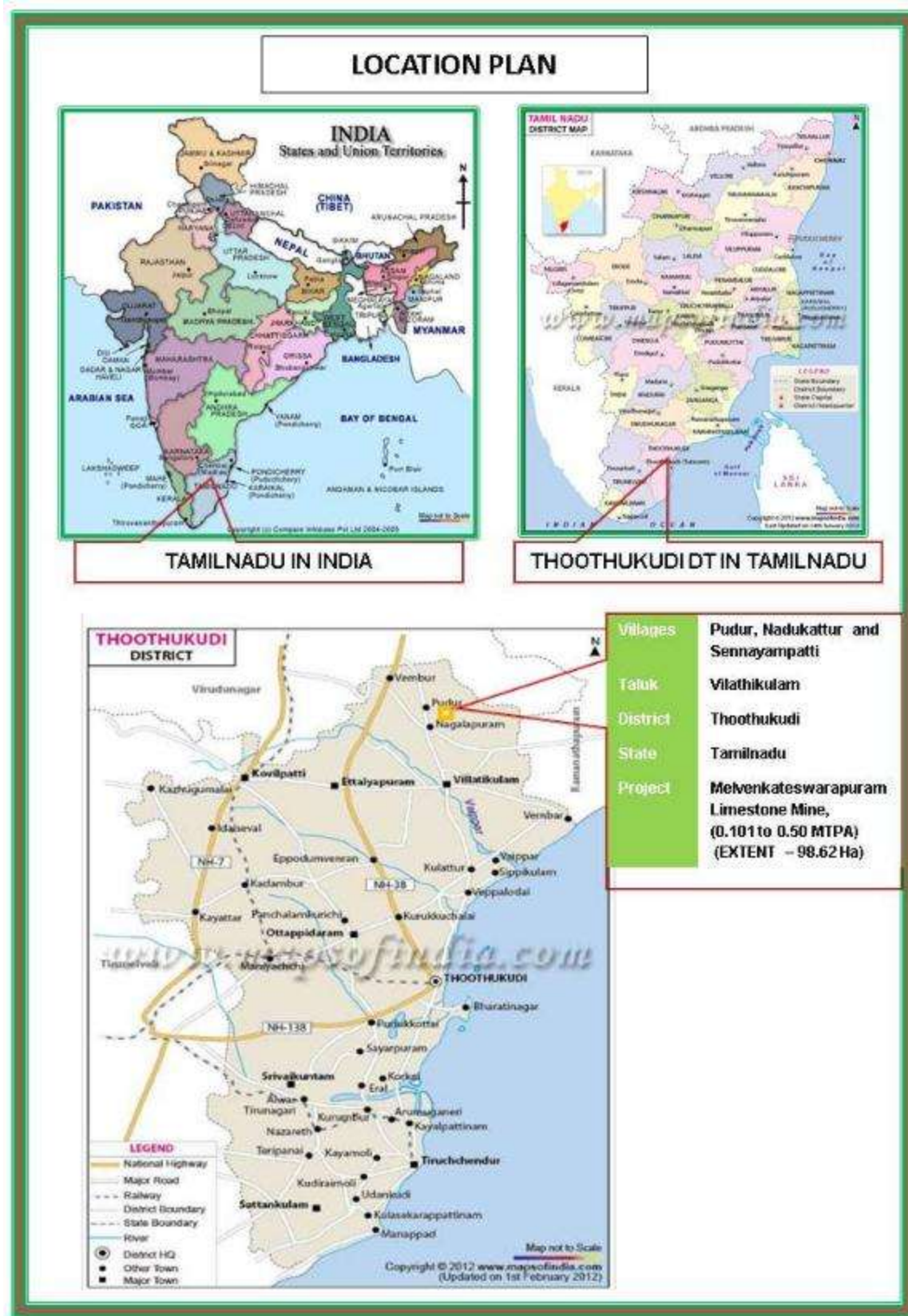
The location Map attached as **Figure No-1.1.**

Land details of the mining lease area are as follows:

District & State	Taluk	Village	Extent in		Classification
			acres	Hectares	
Thoothukudi Tamilnadu	Vilathikulam	Sennayampatti	183.37	74.195	Patta dry
		Pudur	47.05 1.96	19.035 0.795	Patta dry Poramboke
		Nadukattur	11.36	4.595	Patta dry
			243.74	98.620	

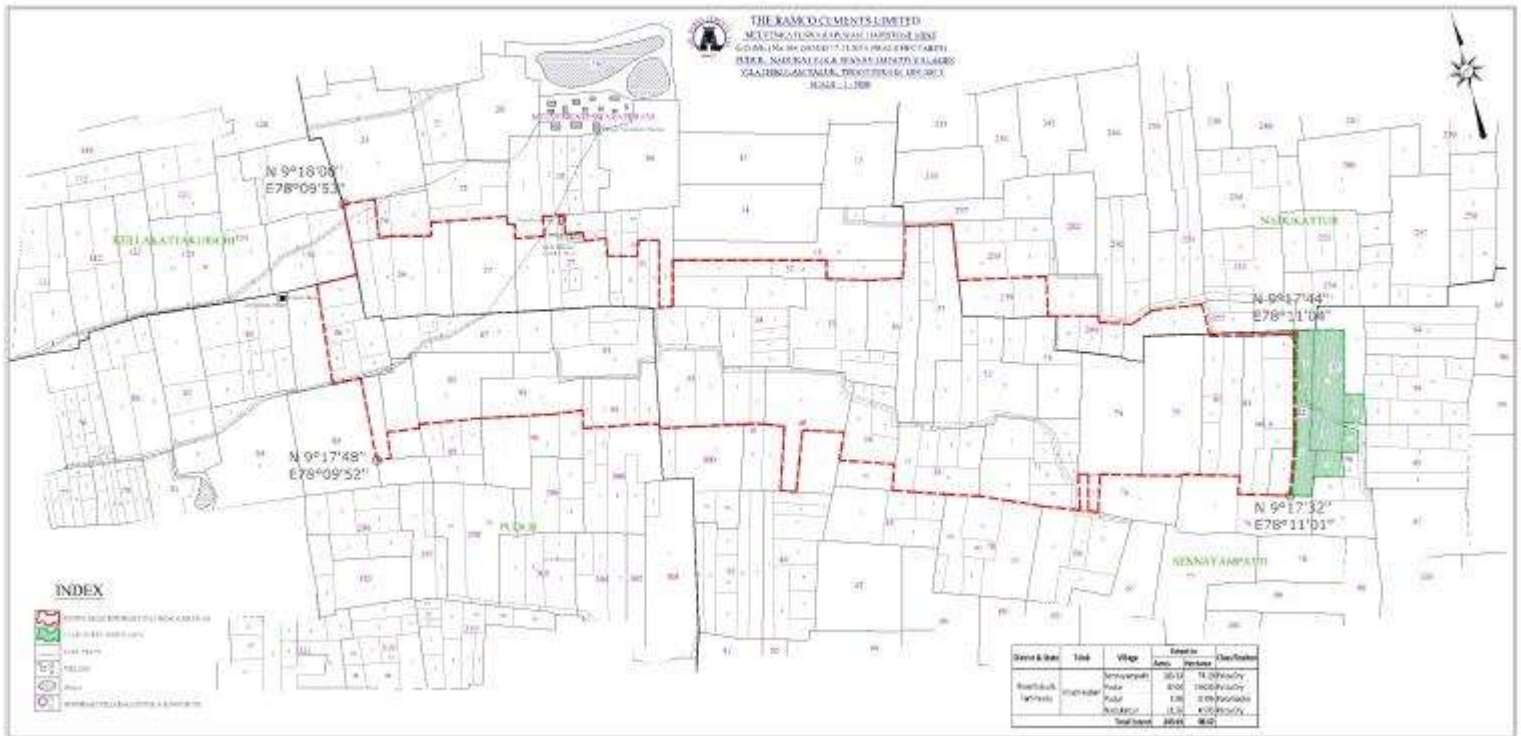
Lease map is given as **Figure No-1.2.**

Figure No.1.1



LEASE PLAN

Figure No 1.2



SATELLITE IMAGERY SHOWING CORNER CO-ORDINATES OF THE LEASE AREA

Figure No 1.3



S.No	Latitude	Longitude	S.No	Latitude	Longitude
1	N9 17 56.2	E78 09 48.8	39	N9 17 46.5	E78 10 57.8
2	N9 18 04.0	E78 09 48.7	40	N9 17 44.7	E78 10 57.7
3	N9 18 04.4	E78 09 52.9	41	N9 17 44.0	E78 11 04.0
4	N9 18 07.9	E78 09 53.0	42	N9 17 31.5	E78 11 01.1
5	N9 18 08.1	E78 09 56.1	43	N9 17 32.4	E78 10 56.9
6	N9 18 04.6	E78 09 56.4	44	N9 17 33.5	E78 10 57.2
7	N9 18 04.4	E78 10 00.6	45	N9 17 34.8	E78 10 51.4
8	N9 18 06.0	E78 10 00.5	46	N9 17 34.7	E78 10 51.2
9	N9 18 05.3	E78 10 06.5	47	N9 17 35.7	E78 10 47.0
10	N9 18 04.6	E78 10 06.3	48	N9 17 32.9	E78 10 46.2
11	N9 18 04.5	E78 10 06.8	49	N9 17 33.2	E78 10 45.3
12	N9 18 03.1	E78 10 06.8	50	N9 17 35.8	E78 10 46.1
13	N9 18 02.8	E78 10 09.0	51	N9 17 36.0	E78 10 45.2
14	N9 18 04.4	E78 10 09.2	52	N9 17 33.5	E78 10 44.7
15	N9 18 04.2	E78 10 10.6	53	N9 17 34.5	E78 10 42.1
16	N9 18 02.8	E78 10 10.4	54	N9 17 35.8	E78 10 40.0
17	N9 18 02.5	E78 10 11.9	55	N9 17 36.8	E78 10 36.5
18	N9 18 01.8	E78 10 11.9	56	N9 17 37.0	E78 10 35.0
19	N9 18 01.5	E78 10 13.6	57	N9 17 37.7	E78 10 32.8
20	N9 18 00.1	E78 10 13.4	58	N9 17 38.1	E78 10 31.1
21	N9 17 59.6	E78 10 16.0	59	N9 17 40.0	E78 10 31.6
22	N9 18 00.9	E78 10 16.2	60	N9 17 41.3	E78 10 27.8
23	N9 18 00.7	E78 10 17.7	61	N9 17 43.9	E78 10 28.6
24	N9 17 55.6	E78 10 16.6	62	N9 17 44.9	E78 10 25.4
25	N9 17 55.5	E78 10 17.4	63	N9 17 39.6	E78 10 23.9
26	N9 17 58.7	E78 10 18.1	64	N9 17 40.0	E78 10 22.6
27	N9 17 56.1	E78 10 28.7	65	N9 17 45.2	E78 10 24.1
28	N9 17 55.0	E78 10 28.6	66	N9 17 46.8	E78 10 14.5
29	N9 17 53.8	E78 10 35.4	67	N9 17 47.2	E78 10 14.6
30	N9 17 57.5	E78 10 36.2	68	N9 17 48.1	E78 10 08.8
31	N9 17 56.9	E78 10 40.2	69	N9 17 49.0	E78 10 09.0
32	N9 17 52.2	E78 10 39.3	70	N9 17 50.8	E78 09 55.4
33	N9 17 51.1	E78 10 45.8	71	N9 17 50.7	E78 09 55.4
34	N9 17 48.2	E78 10 45.5	72	N9 17 50.7	E78 09 53.3
35	N9 17 47.2	E78 10 49.4	73	N9 17 48.3	E78 09 53.4
36	N9 17 46.6	E78 10 49.3	74	N9 17 48.4	E78 09 52.0
37	N9 17 46.3	E78 10 51.5	75	N9 17 54.8	E78 09 52.2
38	N9 17 47.2	E78 10 54.0			

1.5 BRIEF PROJECT PROFILE:

S.No	PROJECT PROFILE & SALIENT ASPECTS	
1.	Name of the Project	Melavenkateswarapuram Limestone Mines
2.	Project Proponent	M/s The Ramco Cements Limited. "Auras Corporate Centre" V Floor, 98-A Radhakrishnan Road, Mylapore, Chennai -600 004. Pho No- 044 - 28478666 , 28478656 Fax no.: 044 – 28478676. Email: ms@ramcocements.co.in
3.	ML area	98.62 Ha
4.	Land use	About 97.82.5 ha of land are private land owned by lessee & the remaining 0.795 Ha is Government land and in TRCL's possession.
5.	Production Capacity	726950 MTPA of ROM / annum of which clean limestone will be 500000 tonnes / annum (0.5 MTPA)
6.	Mine site topography	53 to 60 above MSL
7.	Nearest Road	Pudur-Melavenkateswarapuram road
8.	Nearest Railway station	Aruppukottai – 30 km
9.	Nearest Airport	Madurai – 75 km (from the mines)
10.	Nearest major water bodies	Uppu Odai – 5 km
11.	Nearest villages	Melavenkateswarapuram – 0.7 km (N)
12.	Geological reserves	9496199 T
13.	Mineable reserves	7409807 T
14.	Waste management, Backfilling & reclamation	It is estimated that around 18.19 million tonnes of side burden waste and interstitial reject will be generated till the life of the mine in both the blocks. Out of the above, 9.71 million tonnes of developmental waste will be generated from the western block, of which about 8.25 million tonnes will be dumped Southern side of eastern block along ML – 4.5 to ML – 10 and the rest 1.46 million tonnes will be utilised for road and bund making along mine periphery). The rest 8.47 million tonnes of development waste from Eastern block will be utilized for refilling the worked out pit between ML 12.40 to 15.00 (western pit) upto the surface after exhausting all the reserves in the western pit area. The total area reclaimed by refilling will be 3.897 Ha. The area between ML 1.0 to 10.00 & 16.00 – 20.00 will be left as water reservoir. An area of 5.95 Ha will be left as water reservoir
15.	Method of mining	Open Cast fully mechanized – Drilling and Blasting
16.	Bench Height & width	Height – 9m, Width – more than the height of the bench
17.	Depth of mining	Western block upto -10 RL

		Eastern block upto 0 RL
18.	Blasting	Latest Blasting techniques like NONEL, Electronic System of Initiation system to maintain charge per hole and charge per delay as the same. By adopting such advanced practices in blasting we are controlling PPV well within the norms of 10 mm/sec.
19.	Life of the mine	About 12 years
20.	Mineral beneficiation	Segregation and removal of impurities in the mine face after blasting, screening, removal of finer weathered gneiss after screening, crushing,, screening, magnetic separation for further removal of impurities
21.	Man power	Direct – 46 & Indirect - 200
22.	Water requirement & Source	The total present water requirement for the Melavenkateswarapuram limestone mines is about 50 m ³ /day. No additional water is required after expansion. The exhausted Mine Pit between ML - 1 and ML – 4 in Pandalgudi Mines is kept as a reservoir and is being utilized for other captive mines also.
23.	Site services	Facilities like mines office, canteen, first aid centre, etc are available. The existing infrastructural facilities such as road, power line, building, and water supply sources etc will be suitably upgraded and utilized after expansion also. Well-developed work shop, stores of adjacent Pandalgudi limestone mine will be used for this mine also.

1.6 NEED AND JUSTIFICATION FOR THE PROJECT:

As already mentioned, the enhanced limestone output from this mine will enable TRCL to meet the additional requirements of limestone required for their cement plant due to qualitative constraint. In view of the above necessity, the project is of importance to TRCL.

The operation of the mine has already resulted in improvement in social and physical infrastructure in the local surrounding areas of the project, due to employment prospects in the project directly and indirectly and other peripheral development activities already carried out and to be carried out by the project proponent under their CSR activities. Besides, the State and Central governments are gaining financially through receipt of royalties, taxes, cess, etc.

* * * * *

TOR COMPLIANCE FOR MoEF&CC TOR LETTER No. J- 11015/136/2013-IA-II(M)
DATED - 09.09.2013, 12.06.2015 & 17.09.2015

TOR NO	QUESTIONS	REPLY	PAGE NO
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.	<i>The highest production achieved prior to year 1994 and Year wise production details since year 1994 to 2016 are furnished in para 2.6.1 in chapter II. From the details it can be seen that there is no increase in production</i>	2-10
2	A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given	<i>Mining lease document is enclosed as Annexure- 1</i>	A-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 and mining technology and should be in the name of the lessee.	<i>All the documents like mining plan approval, EIA, Public hearing, etc., are compatible with one another and are in the name of lessee.</i>	-
4	All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ topo sheet 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)	<i>All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery is given in Figure No. 1.3, Chapter-I. Land use and other ecological features of the study area for both core and buffer zone is given in Figure – 3.14 of chapter III.</i>	1 - 8 3 - 86
5	Does the company have 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.	<i>Yes, Comprehensive and effective environmental policy are laid down so as to detect promptly departures or violations of environmental standards and to take immediate corrective actions to set right the environmental status within statutory standards and the same is detailed in para 6.2 in Chapter VI of EIA.</i>	6-1
6	Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast	<i>Subsidence factor does not apply to this project. However, all safety precautions in regard to</i>	4 – 53

TOR NO	QUESTIONS	REPLY	PAGE NO
	mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.	<p><i>regulatory standards are strictly observed and practiced, as shown in para 4.8 in chapter IV of EIA.</i></p> <p><i>Blasting in Melavenkateswarapuram Limestone is practiced using the Latest Blasting techniques like NONEL, Electronic System of Initiation system. Scientific studies conducted through the Department of Mining Engineering, College of Engineering, Guindy, Anna University to study the influence of Blast Induced Ground vibrations on the residential and other buildings of the Neighboring. The study revealed that the ground vibrations generated by the method of controlled Blasting practiced in the mines were well within the permissible levels and hence is not affecting the structures in the neighboring villages.</i></p> <p><i>As suggested by National Institute of Rock Mechanics, KGF, a minimum berm width of 2.5 meters in the final benches, with a safety bench of 8 meters wide for every three benches, taking into consideration of an overall pit slope angle of 43.5° on footwall side and 43° on hang wall will be kept.</i></p>	<p>4-25</p> <p>2-9</p>
7	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	<p><i>The existing environmental scenario is provided for covering 10 km radial distance from the project periphery. Index plan is shown in Figure no. 3.1 in Chapter III.</i></p> <p><i>All the data such as waste generation furnished are for the life period of the lease.</i></p>	<p>3 – 3</p> <p>2-14</p>
8	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	<i>Land use of the study area is studied through satellite imagery to demarcate forest area, agricultural land, grazing land, wildlife sanctuary and national park in the study area and the details are</i>	3 - 67

TOR NO	QUESTIONS	REPLY	PAGE NO																																				
	prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	<p>given in Paras 3.8 in Chapter III of EIA Report.</p> <p>Land use Categories within 10 Km Buffer zone and their Spatial Extent are given below.</p> <table><tr><th>Land use</th><th>Area (Sq.Km)</th><th>%</th></tr><tr><td>Crop Land</td><td>40.795</td><td>10.96</td></tr><tr><td>Fallow Land</td><td>295.224</td><td>79.29</td></tr><tr><td>Plantation</td><td>1.290</td><td>0.35</td></tr><tr><td>Land with Scrub</td><td>20.317</td><td>5.46</td></tr><tr><td>Land without Scrub</td><td>1.779</td><td>0.48</td></tr><tr><td>Barren Area</td><td>0.698</td><td>0.19</td></tr><tr><td>Mines / Mining Dumps</td><td>1.877</td><td>0.50</td></tr><tr><td>Waterbodies</td><td>1.625</td><td>0.44</td></tr><tr><td>Settlement</td><td>7.428</td><td>1.99</td></tr><tr><td>River</td><td>1.313</td><td>0.35</td></tr><tr><td>Total</td><td>372.347</td><td>100.00</td></tr></table> <p>The details of Land use in the lease area are given in Paras 4.5 in Chapter IV of EIA Report. Out of 98.62 Ha of mine lease area 79.12 Ha will be utilized and the rest will remain untouched.</p> <p>Out of 41.72 Ha of mined out area an extent of 3.897 Ha will be refilled, about 5.95 ha will be left as water reservoir and the remaining area of 31.87 Ha will have bench plantation</p>	Land use	Area (Sq.Km)	%	Crop Land	40.795	10.96	Fallow Land	295.224	79.29	Plantation	1.290	0.35	Land with Scrub	20.317	5.46	Land without Scrub	1.779	0.48	Barren Area	0.698	0.19	Mines / Mining Dumps	1.877	0.50	Waterbodies	1.625	0.44	Settlement	7.428	1.99	River	1.313	0.35	Total	372.347	100.00	<p>3-81</p> <p>4 - 30</p>
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Total	372.347	100.00																																					
9	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	<p>As in the recent approved scheme of mining report, there will not be any waste dumping outside the lease area.</p>	-																																				
10	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	<p>No forest land is involved in the project area.</p> <p>Based on the site inspection of DFO on 25.01.2017, Certificate in this regard is obtained from State Forest Department and given as Annexure - 16</p>	A-104																																				

TOR NO	QUESTIONS	REPLY	PAGE NO
	desirable for representative of the State Forest Department to assist the Expert Appraisal Committees		
11	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	<i>As no forest land is involved in lease area, the details required in this para are not applicable for this project.</i>	
12	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	<i>Not applicable, as such no forest land is involved in this lease area.</i>	-
13	The vegetation in the RF / PF areas in the study area, with necessary details, should be given	<i>Not applicable as no forest land is involved in lease area. However, flora and faunal composition of 10 km buffer zone area around project area are fully studied and details are given in para 3.7 of Chapter III.</i>	3 - 58
14	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	<i>The faunal studies in buffer zone are furnished in para 3.7 of Chapter III which shows no wild life areas, protected forest, etc in buffer zone within 10 kms of project area. Hence cost implications for wild life protection do not apply in this case.</i>	3 - 66
15	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, 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 State Wildlife Department/Chief Wildlife Warden under the Wildlife (Protection) Act, 1972 and copy furnished	<i>No national parks, Sanctuaries, wild life corridors, Biospheres, etc occur either in core or buffer zone.</i>	-
16	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, duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the	<i>Detailed biological studies for core and buffer zone areas are conducted and furnished fully in para 3.7 in Chapter III of EIA. In the study area the schedule – I species, Indian Pea Fowl (Pavo Cristatus) are found.</i>	3-58

TOR NO	QUESTIONS	REPLY	PAGE NO
	fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan 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	<i>Conservation Plan for Indian Pea Fowl (Pavo Cristatus) is prepared in consultation with the forest department and financial provision of Rs. 5.0 Lakhs is provided on a combined basis for all the leases of TRCL and its cement plant in the region. Certified Pea Fowl conservation plan along with flora and fauna details in the study area is given as Annexure – 17.</i>	4-39 A-105
17	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	<i>The lease area is not in critically polluted areas or anywhere near to it.</i>	-
18	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)	<i>Not applicable as this is not a coastal project.</i>	-
19	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 located in the mine lease area will be shifted or not. The issues relating to shifting of Village including their R&R and socio-economic aspects should be discussed in the report	<i>As no (R & R) is involved in this project this does not apply to this case.</i>	-

TOR NO	QUESTIONS	REPLY	PAGE NO
20	One season (non-monsoon) primary baseline data on ambient air quality (PM10, SO2 and NOx), 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	<i>The baseline data on micro-meteorology, Air, Water, Noise & Soil has been generated during winter season (Dec 2013 – Feb 2014) and detailed in para 3.3 to 3.6 of Chapter – III. Monitoring stations was selected taking into account of pre dominant wind direction and sensitive receptors. Free silica composition in PM10 sample has been done and the values are found to be Below Detectable Limit (Detection limit – 0.05mg/m³) which is well within the prescribed limit of 5mg/m³.</i>	3 – 39 to 3-66
21	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 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.	<i>Air quality modelling details are fully furnished in para 4.2.1.1 and its continuous sub paras in Chapter IV of EIA report.</i>	4 - 6
22	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.	<i>The total seepage water generation from the mine pit is 90m³/day. The total water requirement for the mine is 50.0 KLD comprising 3.0 KLD for Domestic Sanitary needs and 47.0 KLD for Industrial purposes such as Water sprinkling and dust suppression etc and the required water met from mine sump pit. No additional water is required after expansion. Remaining 40 m³/day used for recharge purpose. The exhausted Mine Pit between ML - 1 and ML – 4 in Pandalgudi Mines at distance - 8.9 km (NW) is kept as a reservoir and is being utilized for other captive</i>	4 - 11

TOR NO	QUESTIONS	REPLY	PAGE NO
		<i>mines also TRCL has established water treatment plant in Pandalgudi to treat the mine water for drinking purposes for both colony and other mines work sites and the same is detailed in para 4.3 along with water balance diagram.</i>	
23	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided	<i>Most of the water requirements for the project are drawn from mine sump water. Although this block comes under safe zone, application to PWD is already made for Ground Water Clearance (Annexure - 10)</i>	A - 53
24	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	<i>Rainwater harvesting is already being done by collecting all garland drain out flows and mine water in settling tanks. The settling tanks are desilted frequently and water conservation measures are detailed in 4.3.4 of in Chapter IV of EIA report.</i>	4 - 21
25	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	<i>Impact of project on surface and ground water qualities and its control measures are described in paras 4.3.0 to 4.3.4 of Chapter IV of EIA report.</i>	4 -11
26	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. 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	<i>Detailed hydrogeological studies have been undertaken and described in paras 3.9 in Chapter III and paras 4.3.2 & 4.3.3 in Chapter IV. In state of Tamil nadu, the Ground water permissions are not regulated by CGWA as per the website Notice issued by CGWB. The State Govt of Tamil Nadu is yet to formulate guidelines for issuance of NOC for Mine dewatering. Although this block comes under safe zone, application to PWD is already made for Ground Water Clearance and frequent follow ups are made (Annexure - 10). TRCL have received reply letters twice in this regard (Letter No. OT7/AG-IV/F4A/2015/dt.13.05.2015, and</i>	3 - 89 4 – 18 A - 53

TOR NO	QUESTIONS	REPLY	PAGE NO
		<i>Letter No.OT9/AG3/Mining Project/2016 dt 08.12.2016) from PWD dept regarding the same. Copy of NOC shall be submitted to on receipt of the same.</i>	
27	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	<i>No stream passes through lease area and no diversion of water bodies is required.</i>	-
28	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	<i>Detailed hydrogeological studies have been undertaken and described in paras 3.9 and the water table contour is shown in Figure No. 3.16 in Chapter III.</i>	3 – 89 3 - 90
29	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	<i>Presently about 9.175 Ha of area are covered with around 10100 nos of plantation / green belt, of which 2.90 Ha are within the lease area and the remaining 6.275 Ha are outside the lease area.</i> <i>In the scheme period about 1.40 Ha within the lease area will be developed with plantation / Green belt. Every year on average 750 saplings will be planted. It is planned to plant Neem, Tamarind, Pungai, Naval, Jetropha, Mango etc.</i> <i>In ultimate stage Green belt over an area of 14.13Ha will be carried out along mine periphery, virgin area and along the mine hauling roads in the lease area.</i> <i>This details are given in para 4.6.4 to 4.6.6 in Chapter IV.</i>	4 - 37
30	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	<i>The changes in present logistical system will be insignificant due to negligible expanded production from the lease area as logistical transport roads are dedicated and belong to TRCL. The details in this respect are furnished in para 4.9 in Chapter IV of the report.</i>	4 - 56

TOR NO	QUESTIONS	REPLY	PAGE NO
31	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA report.	<i>The facilities provided to mine workers are provided in para 2.14 in Chapter II.</i>	2 - 19
32	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.	<p><i>Out of 98.62 Ha of mine lease area 79.12 Ha will be utilized and the rest will remain untouched.</i></p> <p><i>In the post mining stage, Out of 41.72 Ha of mined out area an extent of 3.897 Ha will be refilled, about 5.95 ha will be left as water reservoir and the remaining area of 31.87 Ha will have bench plantation. Besides, 16.72 Ha of Dump area & Topsoil storage area of 3.70 Ha will also be covered with plantation.</i></p> <p><i>In the ultimate stage, plantation / bench plantation will be carried out in 35.77 Ha mined out area including 3.897 Ha of backfilled area. Besides, 16.72 Ha. of Dump area & Topsoil storage area of 3.70 Ha will also be covered with plantation. Besides, Green belt over an area of 14.13Ha will be carried out along mine periphery, virgin area and along the mine hauling roads. Thus about 70.32 Ha covered under Green Belt/ Bench Plantation in the total lease area of 96.82 Ha in post operational period.</i></p> <p><i>The conceptual post mining landuse plan along with reclamation systems are described in paras 4.5, 4.5.1 and 4.5.2 in chapter IV of EIA and also shown in Figure No. 4.6.</i></p>	4 – 30 to 4 - 32
33	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	<p><i>The time bound greenbelt development plan is furnished in paras 4.6.5 and 4.6.6 in Chapter IV.</i></p> <p><i>Question of compensatory afforestation does not arise, as no forest lands are involved in lease area or buffer zone areas.</i></p>	4 -36 to 4 - 38

TOR NO	QUESTIONS	REPLY	PAGE NO
	details of plantation already done should be given		
34	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	<p><i>Elaborate details in this respect are furnished in para 4.8 and its sub paras in Chapter IV.</i></p> <p><i>Copy of Report of Medical Examination in "Form O" enclosed in Annexure – 14 of EIA/EMP report.</i></p>	<p>4 - 53</p> <p>A – 69</p>
35	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	<p><i>The health status of the area is deciphered from the discussion and data collection from the nearby Primary Health Centre at Pandalgudi, Virudhunagar District, Health care services of TRCL and discussion with locals.</i></p> <p><i>These details are given in para 3.2.5 and its sub paras.</i></p>	3-33
36	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	<p><i>TRCL has undertaken elaborate social outreach programmes to improve the social and physical infrastructure of local community and local areas taking into account the need based aspirations of local community concerned under their "CSR" initiatives.</i></p> <p><i>"CSR" activities are carried out by TRCL with a missionary approach and motto with strategic planning with involvement of Board of Directors as well as senior concerned officers and also local community members.</i></p> <p><i>TRCL on the whole has spent Rs.7.80 crores during the year 2014-15 under various social welfare measures like donation and repair to temples, school room construction as addition, up gradation of youth skills of local community, sponsorship for sports and cultural activities etc. TRCL is spending around Rs.172.88 lakhs (Year 2014 - 2015) towards CSR in R.R Nagar unit cement plant & its captive mines.</i></p> <p><i>Rs.21.96 lakhs was spent in year 2015 – 2016 for CSR activities</i></p>	4 - 44

TOR NO	QUESTIONS	REPLY	PAGE NO
		<p><i>under lease area of Melavenkateswarapuram Limestone Mine alone.</i></p> <p><i>They have further planned for every year from this mine lease, Rs. 20 lakhs will be spent under CSR. The breakup of the same will be decided based on the immediate need and priority. The elaborate details on above aspects are furnished in para 4.7 in Chapter IV of EIA.</i></p>	
37	Detailed environmental management plan 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	<p><i>Detailed environmental management plan for implementation of various measure to abate impacts in the project within sustainable statutory limits is provided in Chapter IX of EIA.</i></p>	9-1
38	Public hearing points raised and commitment of the project proponent on the same along with time bound action plan to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project	<p><i>Public hearing for this project was held on 25.02.2016 at T.R.Subbaraj Kalyana Mahal, Paralachi Road, Pudur, Villathikulam Taluk, Thoothukudi District through District Collector-Thoothukudi, District Environmental Engineer - Tamil Nadu Pollution Control Board after following mandatory procedures.</i></p> <p><i>The elaborate details of public hearing points along with proponent commitment are furnished in Para 7.1 in Chapter-VII and Annexure-15.</i></p>	A-79
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	<p><i>No litigation is pending against this project.</i></p>	-
40	The cost of the project (capital cost and recurring cost) as well as the cost towards implementation of EMP should clearly-be spelt out	<p><i>The capital cost of this project is about Rs. One crore. The recurring costs will be varying and will be reviewed from year to year. The probable cost of recurring environmental control cost for the Melavenkateswarapuram lease are calculated as 56 lakhs.</i></p> <p><i>However the production cost of limestone will be on commensurate basis to provide normal profit margins from realized</i></p>	6 - 9



TOR NO	QUESTIONS	REPLY	PAGE NO
		<i>cement prices.</i>	
41	Details of Transportation of mined materials as per the Indian Road Congress for both the ways (loaded as well as unloaded trucks) and its impact on Environment be provided	<i>These conditions are already being and will be enforced during transportation of mined out limestone. Details given in Para 4. 9 of Chapter IV of EIA/EMP report.</i>	4 -56
42	Studies by any reputed Institute on Cumulative impacts due to simultaneous mining by all the operating Mines in the Study area be conducted and a Report submitted	<i>The study has been carried out by Manonmanium Sundaranar University, Tirunelveli for cumulative impacts due to simultaneous mining by all operating mines covering in the study area.</i>	-
43	Status of the required Compliance Report from the Regional Office of MoEF	<i>Cerified Compliance report for Environmental Clearance vide letter No.J-11015/6/99-1A.II(M) of 22.11.1999 from MOEF&CC is given in Annexure – 9 as mentioned in para 1.2.4 of Chapter I of EIA.</i>	A - 46

CHAPTER – II

PROJECT DESCRIPTION

2.1 GENERAL:

This expansion project is planned to produce 0.5 million tonnes (0.726 MTPA of ROM) from existing 0.101 MTPA of limestone to meet the captive needs of 2 MTPA capacity Ramasamyraja Nagar Cement plant of TRCL. As such, this project will help to ensure continuous and steady supply of qualitative and quantitative requirements of TRCL's captive cement unit at R.R Nagar in future from their nearby mining leases.

2.2 SITE DESCRIPTION:

The entire lease area is situated in Pudur, Nadukattur & Sennayanpatti Villages of Vilathikulam Taluk, Thoothukudi District, Tamil Nadu.

The mine site is well connected and is at a distance of 0.50 km East of Pudur – Melavenkateswarapuram road which in turn is connected to NH – 45(B). Nearest rail head Aruppukottai is 30km away.

The lease area or surrounding 10km buffer zone area does not include any forest lands nor do any natural sensitive features like water bodies, national parks, wild life sanctuary etc. The area does not come under CRZ category.

The study area has got good basic amenities like education, medical, drinking water and approach roads. All the villages have good connectivity through good tar roads and telecommunication facilities and public transport. Some of the villages have piped water supply. Postal and electricity facilities are available in all villages.

2.3 TOPOGRAPHY AND DRAINAGE:

The area is generally flat topography with an elevation of about 53 to 60 meters above MSL. There is no prominent river or stream running in this area. The surrounding lands are of dry type with seasonal crops and devoid of perennial vegetation.

2.4 GEOLOGY AND RESERVES:

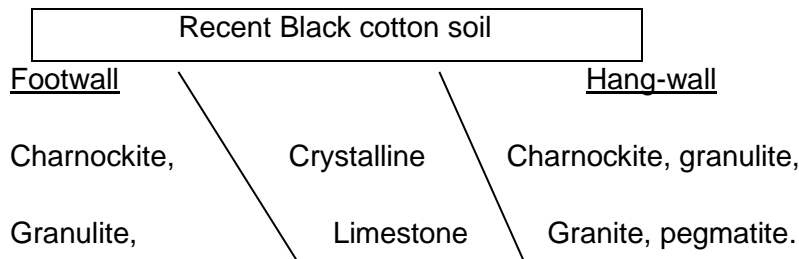
2.4.1 GEOLOGY OF THE LEASE AREA:

The entire area comprises of archaean formations completely covered by 0.40 to 1.00 metre thick black cotton soil. Below this soil cover, the rocks, namely, Charnockite, granite, granulite, limestone and pegmatite occur. The charnockite and pyroxene granulite occur as hang wall and footwall of limestone band and they are as follows:

Formation	Age
Black cotton soil -	Recent
Charnockite, granulite, granite, pegmatite, Limestone, pink granitic gneiss	Achaean

The aforesaid formations are illustrated below as a schematic section.

Surface



The rocks have undergone repeated folding as seen from the existing quarry faces. The crystalline limestone band occurs as a linear band within the Archaean rock which has also undergone folding and recrystallization. This is evident from the mine faces and irregular behavior of the hang wall and foot wall contact of the limestone band on the surface. Lot of intrusions and inclusions viz., granulite, granites, charnockites, pegmatite, and pyroxene patches etc., occur within the limestone band. The hanging wall and foot rocks are weathered up to about 15 to 20 meters depth and become harder below this depth.

The limestone is bouldery at the top for 3 to 4 metres and become massive below with joints. There is a small discontinuity in the band near ML-11. The deposit is divided into two blocks namely western and eastern block with respect to this discontinuity. The area between ML 0 –11 named as 'Eastern Block' and the area between ML 12 to 22 is named as 'Western



Block'. The strike is almost East-West and the strike length of the deposit is about 2.1km with width varying from 40 meters to 90 meters. The dip varies from 30° to 50° towards north.

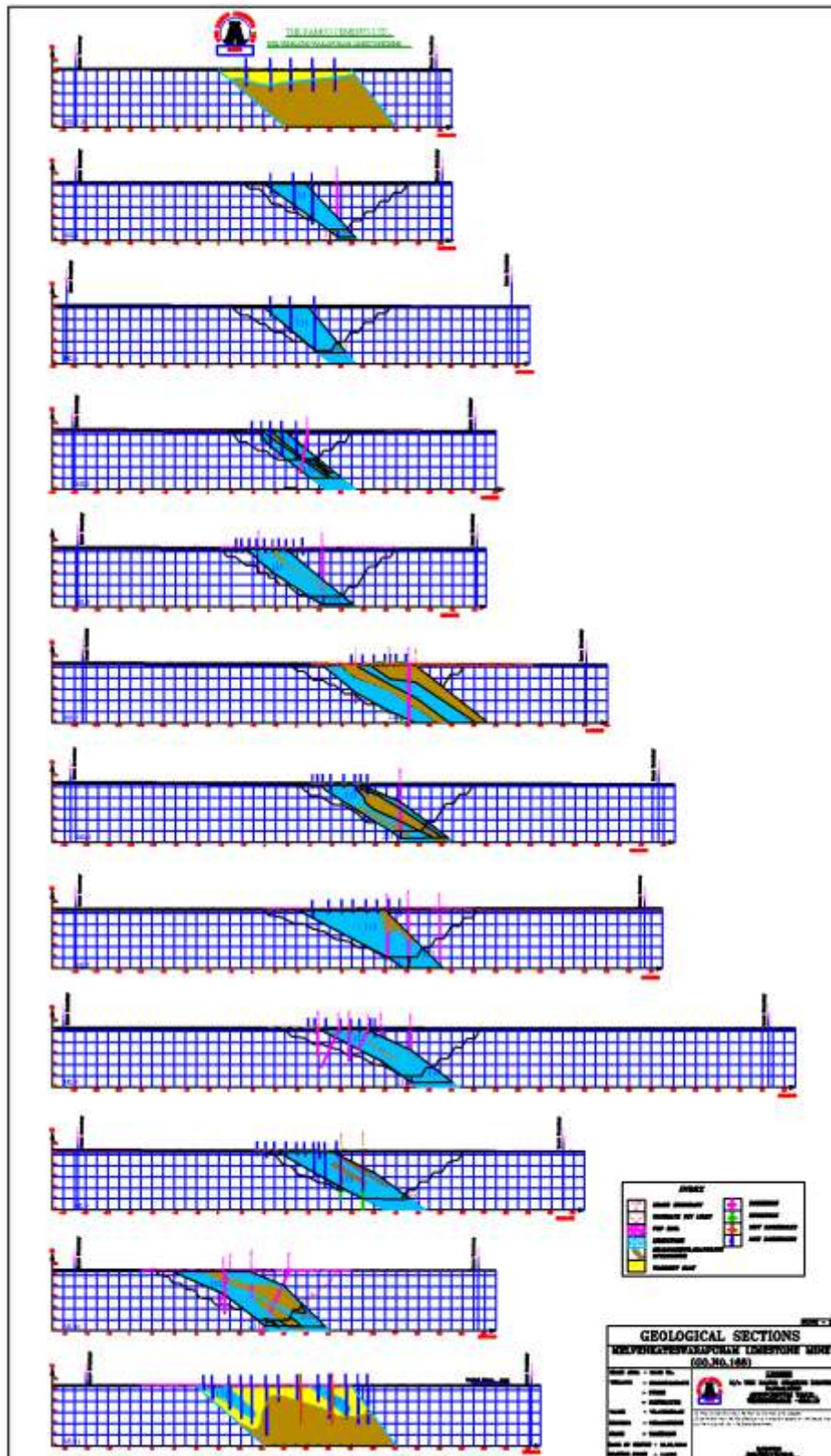
The hanging wall and foot wall contacts have different dips with footwall contact having gentler dip than that of hanging wall which has resulted in narrow width of the band at bottom levels. Geological plan & Cross section is given as **Figure No - 2.1& 2.2.**

Figure No. 2-1



GEOLOGICAL CROSS SECTION

Figure No. 2-2



2.4.2 Reserves Estimation:

2.4.2.1 Exploration:

The Melavenkateswarapuram limestone deposit has been prospected fully by means of 72 numbers of diamond drill holes with a total metreage of 2998.15 meters. Based on the exploration so far carried out all the reserves are in proved category and hence no further drilling is proposed.

2.4.2.2 Method of estimation of Reserves:

Geological cross sectional method was adopted for estimation of reserves after leaving certain extent for safety distance and also for systematic mining. The Limestone band falling between ML 0 to ML-22.00 has been proved in detail and the exploration data were sufficient to calculate the reserves under proved reserves.

a) Eastern Block

Based on the intensity of exploration carried out prior to the scheme period, the reserves were classified under measured category. All the reserves falling within sections 0 to 11.00 were "proved" category.

b) Western Block

The limestone reserves between sections ML 11.00 to ML-22.00 fall under "measured category that is "proved" category.

Since sufficient bore holes have been drilled in both the blocks to prove the deposit.

The intersectional area between two consecutive cross sections for a particular unit was computed by averaging the cross sectional areas on the two consecutive section lines. The average intersectional area thus obtained was multiplied by the mean distance between two consecutive cross sections to give the volume of that particular unit (for e.g. limestone or waste rock or soil) between these two sections.

This volume in cubic meters was then converted into weight in tonnes by applying the volume to weight ratio also referred to as the tonnage conversion factor. A bulk density of 2.5 for limestone and 2.86 for hang wall, Footwall and intrusive rocks, were taken for calculation.

2.4.2.3 Geological Reserves:

The reserves as per UNFC classification is as follows:

ABSTRACT	
CLASSIFICATION OF RESERVES FOR G.O.Ms-168	TONS
Proved Mineral Reserve (111)	7409807
Sub Total Reserves	7409807
Feasibility Mineral Resource (211) Locked up Ore	941360
Inferred Mineral Resource (333) Locked up Ore	1145032
Sub Total Resources	2086392

2.4.2.4 Mineable Reserves:

The entire proved mineral reserves of 7.409 Million tonnes are considered as mineable reserves.

2.5 Mining scheme:

Mechanized open cast mining is adopted in Melavenkateswarapuram mines using heavy earth moving machinery; right from the inception of the mine in 1985. The same will be continued after expansion also.

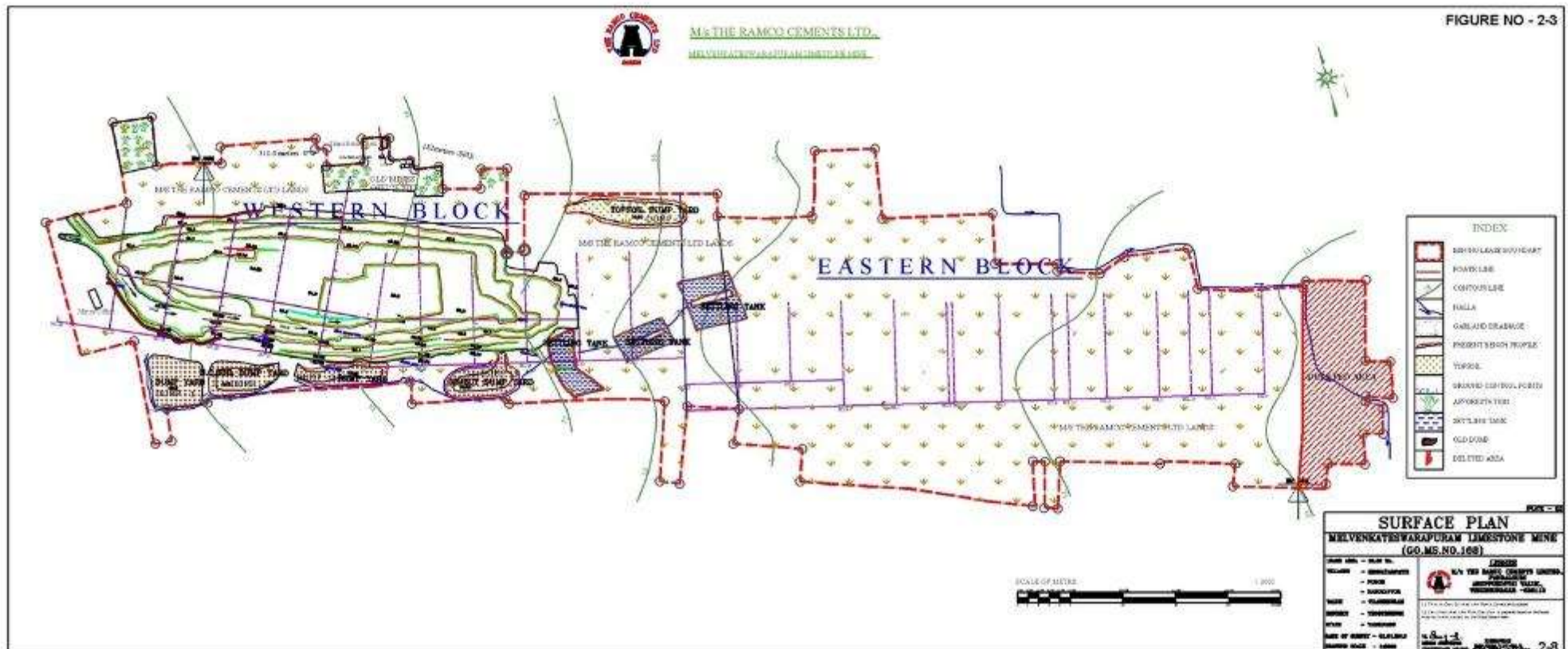
The mine workings are divided in to two blocks namely West block and east block.

Presently mining operations are carried out in the west block only.

Surface layout plan depicting the present mine position is given as **Figure No 2.3**.

SURFACE PLAN

Figure No – 2.3



Out of the total length of 2.1 kilometers of the deposit, the western block of about 1.1 kilometer length from ML 12 to ML 22 will be taken up for mining in the present scheme period. It is envisaged to remove around 500000 tons of clean limestone (7, 26,950 tons of ROM) per annum during the remaining 3 years of Modified Mining plan period (2015-16 to 2017-18).

After exhaustion of western block, the eastern block between ML 11 and ML 0 will be taken up for mining. Waste to be generated from eastern block will be used for refilling the mined out void in western block area between ML 12.40 and 15.00 upto surface. Top soil will be spread over the area and it will be suitably reclaimed.

Based on the cost economics, the overall waste ratios has to be restricted with in 1:2.73, hence ultimate depth has reduced to -10 RL in western block and 0 RL in eastern block. After exhausting all the limestone upto the economic level, the ML area between ML 1.0 to 10.00 & 16.00 – 20.00 in eastern and western blocks will be left as water reservoir.

The bench height is maintained at 9 meters commensurating the digging height of the shovel. The bench width of more than the bench height will be considered. Latest Blasting techniques like NONEL, Electronic System of Initiation system to maintain charge per hole and charge per delay as the same. By adopting such advanced practices in blasting we are controlling PPV well within the norms of 10 mm/sec.

Rock breakers would be utilized for breaking of large boulders generated during primary blasting and thereby secondary blasting would not be adopted. No of trials has been undertaken in the adjacent other deposits successfully and hence this system is also being utilized in Melavenkateswarapuram Mines.

Considering the geological nature of the deposit, viz, the inherent quality of crystalline limestone associated with granulite and charnockites, the conventional system of mining, involving drilling, blasting and deployment of Heavy Earth moving Equipments will be continued at Melavenkateswarapuram mine for both Development and Production.

In the ultimate stage, as suggested by National Institute of Rock Mechanics, KGF, a minimum berm width of 2.5 meters in the final benches, with a safety bench of 8 meters wide for every three benches, taking into consideration of an overall pit slope angle of 43.5° on footwall side and 43° on hang wall will be kept.

2.6 PRODUCTION DETAILS AND LIFE OF MINE:

2.6.1 EARLIER PRODUCTION DETAILS:

Prior to 1994 the highest production of 147004 Tonnes achieved in the year 1992 - 1993. EC for 0.101 MTPA capacity obtained in year 1999.

The year wise production from Melavenkateswarapuram lease since year 1994 onwards to 2014 is given below:

YEARWISE PRODUCTION DETAILS FOR G.O.MS.NO –168	
Year	Production in Tonnes
Prior Year 1994 (1992-1993)	147004
1994-1995	100812.59
1995-1996	98112.00
1996-1997	2228.34
1997-1998	1907.27
1998-1999	1143.87
1999-2000	0.00
2000-2001	3768.91
2001-2002	18306.45
2002-2003	48267.56
2003-2004	100517.35
2004-2005	100066.00
2005-2006	81579.39
2006-2007	92406.00
2007-2008	97304.04
2008-2009	96958.75
2009-2010	88451.93
2010-2011	79923.04
2011-2012	53936.73
2012-2013	52253.11
2013-2014	84328.61
2014-2015	92300.11
2015-2016	99782.05
2016-2017	100727.42

From the above details it can be seen that there is no increase in production.

2.6.2 PLANNED PRODUCTION DETAILS:

As already mentioned, after expansion the yearly limestone production from this mine will be 500000 tonnes (0.50 MTPA).

Year wise production of limestone and waste during the Modified Mine plan are as follows:

S.No	Year	ROM Limestone	Clean Limestone	Reject	Side burden Development Waste	Total Waste	Ore :OB
		(Tonnes)	(Tonnes)	(Tonnes)	(Tonnes)	(Tonnes)	
1	2015-16	719625	500000	219625	954811	1174436	1:2.34
2	2016-17	723000	500000	223000	1174030	1397030	1:2.79
3	2017-18	726950	500000	227000	1097811	1324811	1:2.64
Total		2169575	1500000	669625	3226652	3896277	1 : 2.60

The production details of the conceptual stage are as follows:

S.No	Year	Limestone	Total Waste	Ore: O.B
1	2018-19 to 2022-23	2725199	5823342	1 : 2.14
2	2023-24 to 2026-27	2514985	8475795	1 : 3.37
		5240184	14299137	1 : 2.73

Considering the present proved reserves and average production quantity of 0.5 MTPA (0.726 MTPA ROM) the life of the mine will be 12 years.

The mine position at the end of the scheme period is enclosed as **Figure No -2.4.**

Figure No –2.4



2.7 EXTENT OF MECHANIZATION:

The availability of machinery is around 75 to 80%. It is proposed to mine 726950 tons (maximum) of ROM limestone (500000 tons of Clean Limestone) a year from this mine.

During the remaining three years of the Modified Mining plan period i. e from 2015-16 to 2017-18 the production will be between coordinates ML – 14.50 to ML – 21.50. The production for the years 2015-16, 2016-17 & 2017-18 will be 50000 T of clean limestone/ 7, 26,950 tons of ROM in each of the years for which a development of 1174436, 1397030 & 1324811 Tonnes respectively will have to be carried out. The overall Ore: O.B ratio during the modified Mining plan period comes to 1: 2.60. (T: T)

The following machineries are proposed exclusively for the development and production works at this mine to achieve the above said production:

Name of Machinery	H.P	Make/Model	Capacity	Numbers
Excavator	330	TATA Hitachi	3.3 Cu.m	1
Backhoe loader	250	L&T komatsu	0.9 Cu.m	3
Air Compressor Diesel	350	Atlas Copco	400 cfm	2
BVB 25 drill		Atlas Copco	112mm dia	2
Dewatering pump	75		9000 lpm	1
Rock Breaker for Secondary breaking	200		100 TPH	1
Primary Breaker/X centric Breaker	314		300 TPH	1
Taurus for production transport & Development	120	Volvo /AMW /MAN	30 T	14
Jeeps		Mahindra		1
Water Sprinkler	10000	Escorts Tractor with tanker mounted	-	1
Explosive van	88	TATA 702	3T	1

2.8 BLASTING:

Blasting in Melavenkateswarapuram Limestone is practiced using the latest method of blasting techniques like NONEL, Electronic system of initiation to maintain charge per hole and charge per delay as the same. By adopting such advanced practices in blasting we are controlling PPV well within the norms of 10 mm/sec. This system forms a part of Controlled Blasting system wherein the amount of Explosives blasted in a fraction of time is controlled by introduction of delay timings between the holes so as to reduce the ground vibrations induced due to blasting. The Firing sequence of the blast hole column is also designed to be Bottom to

top so that the blasted rock immediately falls down due to gravity and has no Fly rock. Slurry explosives or Emulsion explosives in combination with Ammonium Nitrate Fuel oil explosives are used for charging the Explosive column. The usage of Shock Tube detonators for initiation provides for Bottom Initiation of the Hole thereby reducing the Fly rock, minimal ground vibration and increased safety.

Advantages:

1. Perfect bottom initiation which controls the fly rock.
2. Accurate timing to keep the initiation sequence precisely and helps to control blast induced vibration.
3. Helps to maintain precise blast mass heaps and quality control of the blast material.

The Management has conducted scientific studies through the Department of Mining Engineering, College of Engineering, Guindy, Anna University to study the influence of Blast Induced Ground vibrations of the Melavenkateswarapuram Limestone Mines on the residential and other buildings of the Neighboring villages in December 2012. The study revealed that the ground vibrations generated by the method of controlled Blasting practiced in the mines were well within the permissible levels and hence is not affecting the structures in the neighboring villages. Precautionary measures against Fly rock, Ground Vibrations & Noise are strictly taken care during blasting operations. The Blasting operations are placed under the direct supervision of the Mines Manager who is a qualified Mining Engineer & possesses Mine Manager's First class certificate of competency issued by Directorate General of Mines safety, Govt of India and is assisted by adequate statutorily qualified personnel. Copy of explosive license is given vide

Annexure – 7.

2.9 WASTE MANAGEMENT:

The dumps presently located are well within the lease area and also proposed dumping is also within the Mining Lease area.

The height of present dump yards is 15 to 20 meters. Ultimate height will be about 30m.

A new dump yard is proposed on the Southern side of eastern block along ML – 4.5 to ML – 10 during the modified mine plan period.

It is estimated that around 18.19 million tonnes of side burden waste and interstitial reject will be generate till the life of the mine in both the blocks. Out of the above, 9.71 million tonnes of waste will be generated from west block, of which about 8.25 million tonnes will be dumped Southern side of eastern block along ML – 4.5 to ML – 10 and the rest 1.46 million tonnes will be utilised for road and bund making along mine periphery). The rest 8.47 million tonnes of development waste from Eastern block will be utilized for refilling the worked out pit between ML 12.40 to 15.00 (western pit) upto the surface after exhausting all the reserves in the

western pit area. The total area reclaimed by refilling will be 3.897 Ha. The area between ML 1.0 to 10.00 & 16.00 – 20.00 will be left as water reservoir. An area of 5.95 Ha will be left as water reservoir.

Top Soil

As per the proposed mining programme, there is no likely hood of generation of top soil during scheme period as working will be carried out only in the already opened up pit.

If any topsoil will be generated in future stacked separately and kept as dumps which utilized for future reclamation after exhaustion of mineral reserve.

2.10 LAND USE PATTERN:

The mine lease area of **98.62 Ha** is mostly dry waste private patta land /Government land owned/leased to The Ramco Cements Limited. There is no major vegetation except for some thorny bushes. Out of 98.62 Ha of mine lease area 79.12 Ha will be utilized and the rest will remain untouched.

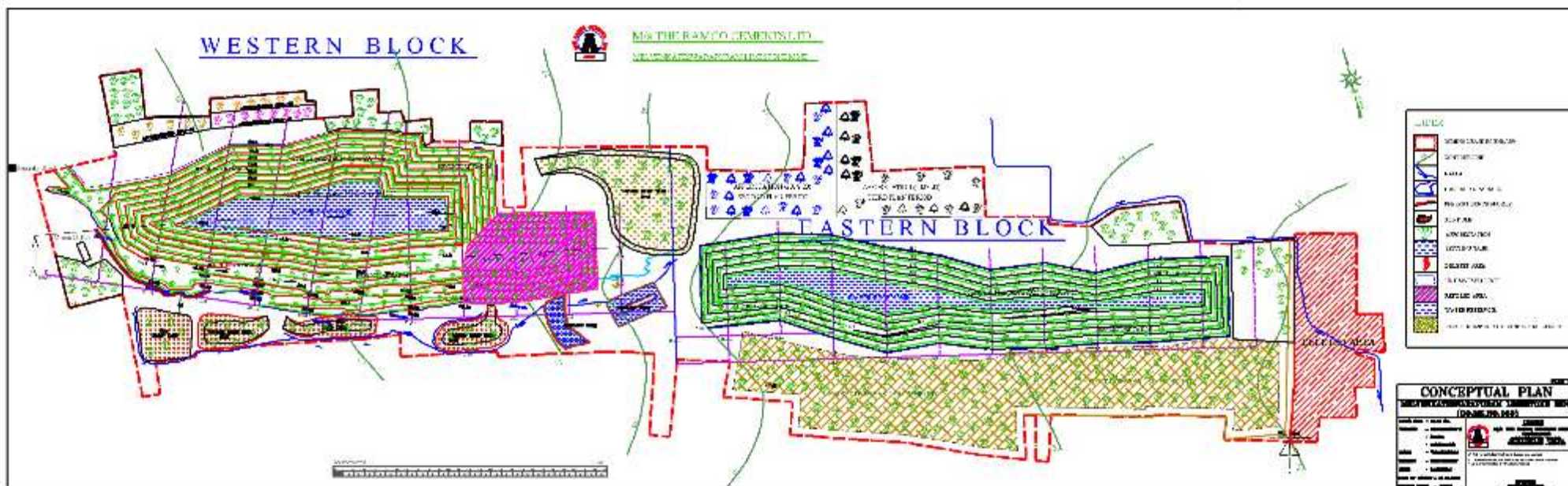
SI No	Head	At Present (Area in Ha)	End of 5th year (Area in Ha)	Life of the mine (Area in Ha)
1	Area of excavation	20.35	24.97	41.72
2	Storage of top soil	1.03	3.70	3.70
3	Overburden/dump	2.95	10.33	16.72
4	Mineral Storage	-	Nil	Nil
5	Infrastructure(Workshop / Building)	0.05	0.05	0.05
6	Roads	0.20	0.20	0.20
7	Railways	-	Nil	Nil
8	Green belt / Afforestation	2.90	4.30	14.13
9	Tailing pond	-	Nil	Nil
10	Effluent treatment plant	-	Nil	Nil
11	Mineral Separation plant	-	Nil	Nil
12	Town ship area	-	Nil	Nil
13	Others	2.20	2.40	2.60
	Total	29.68	45.95	79.12
	Unused land	68.94	52.67	19.5
	Grand Total	98.62	98.62	98.62

Out of 41.72 Ha of mined out area an extent of 3.897 Ha will be refilled, about 5.95 ha will be left as water reservoir and the remaining area of 31.87 Ha will have bench plantation.

The post mining land use plan / Conceptual plan along and cross section is shown as **Figure No. 2-5 & 2-6.**

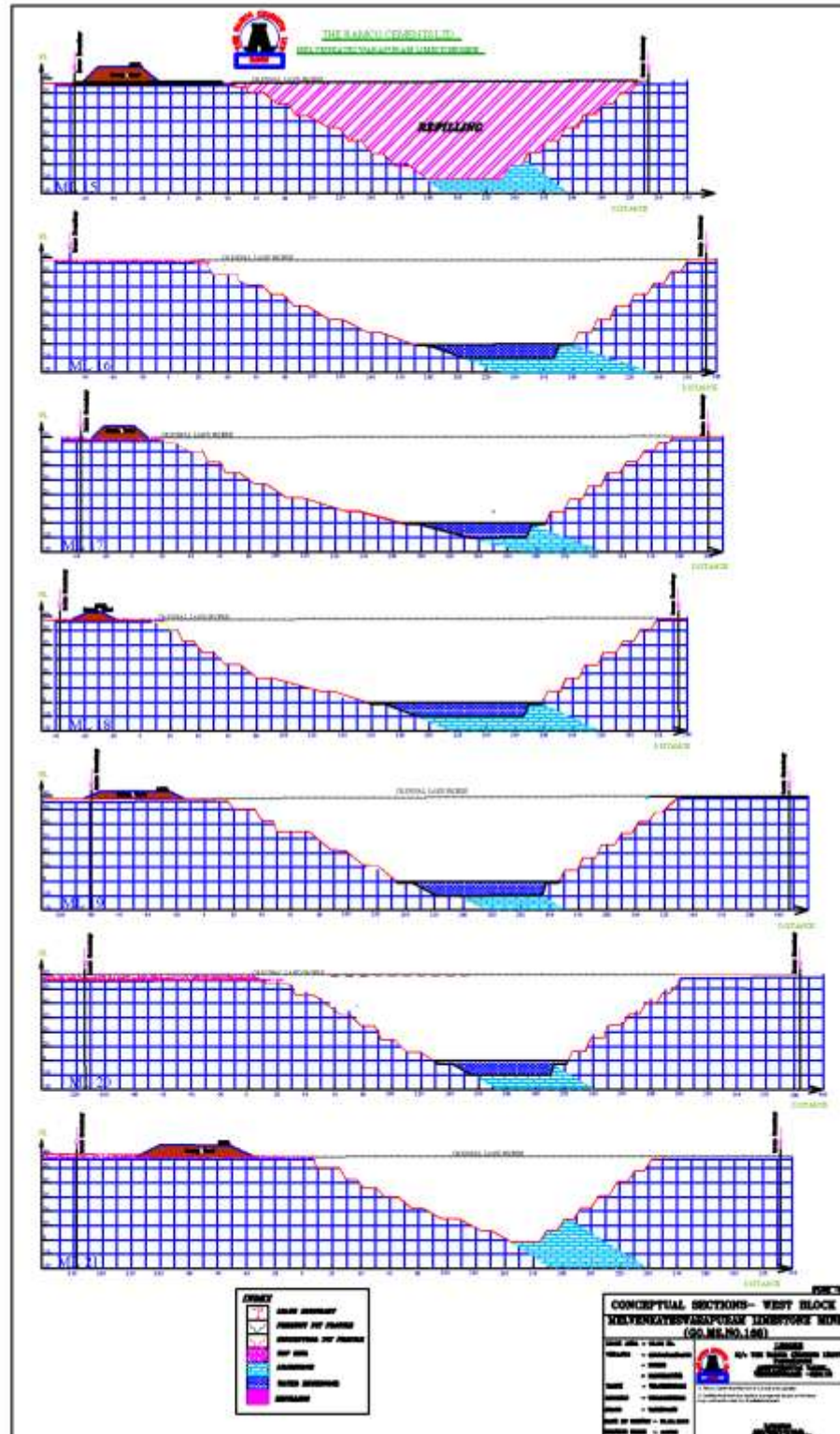
CONCEPTUAL PLAN

Figure No. 2- 5



CONCEPTUAL CROSS SECTION – WESTERN BLOCK

Figure No - 2.6



2.11 MINERAL BENEFICIATION:

Even though the Melavenkateswarapuram limestone deposit quality of pure limestone is good, the contaminants like granulites charnockites, etc mentioned above substantially dilute the quality of limestone produced. This varies from 70 to 74% TCo₃. Since the requirement from Melavenkateswarapuram mine is plus 74%. Total Carbonate with a size of minus 25 mm.

No beneficiation process is involved in this lease area. The ROM limestone production of 0.726 MTPA from this lease is taken to the nearby Pandalgudi Crusher house for further size reduction in the crusher arrangement and sorting of contaminants using Optical Sorter arrangement provided in Pandalgudi crusher house.

2.12 USE OF LIMESTONE:

Limestone from this mine will be utilised for manufacture of cement. This cement plant of TRCL is located at R.R.Nagar in Virudhunagar district of Tamilnadu with a capacity of 3200 TPD of clinker. The lessee is proposing to produce 0.50 MTPA (0.726 MTPA ROM) from this lease and the balance limestone quantity for the plant will come from other leases of the company.

2.13 REQUIREMENTS:

2.13.1 Man Power:

The mining operation in Melavenkateswarapuram has provided direct employment for about 46 persons. Besides, about 200 persons are indirectly employed in allied services like logistics, etc.

2.13.2 Water:

The total present water requirement for the Melavenkateswarapuram limestone mines is 50 m³/day. The water requirement for the mine is as follows:

○ For domestic sanitary needs	- 3.0 KLD
○ For dust suppression and green belt development etc	- 47.0 KLD
Total	- 50.0 KLD

No additional water is required after expansion.

The exhausted Mine Pit between ML - 1 and ML – 4 in Pandalgudi Mines at distance - 8.9 km (NW) is kept as a reservoir and is being utilized for other captive mines also. TRCL has established water treatment plant in Pandalgudi to treat the mine water for drinking purposes for both colony and other mines work sites.

2.13.3 ELECTRICITY REQUIREMENT:

415 Volt (LT) state grid supply is available in the mines site to meet the quarry load. A standby 63 KVA Generator has been installed to meet the contingency requirements.

2.14 SITE SERVICES:

In the Melavenkateswarapuram mines facilities like mines office, canteen, first aid centre, etc are available. The existing infrastructural facilities such as road, power line, building, and water supply sources, etc will be suitably upgraded and utilized after expansion also.

A well-equipped garage is established at Pandalgudi to repair and maintain the fleet of heavy earth moving equipments. Any major over hauling will be carried out in Pandalgudi Auto Garage. A sub – store is maintained at Pandalgudi for storing the machinery spare parts. A diesel storage tank is maintained at Pandalgudi for supply of diesel through a diesel bowser to machines.

All the employees have been provided with housing accommodations built by the Company near Pandalgudi.

2.15 ENVIRONMENTAL MANAGEMENT BEING AND TO BE ADOPTED IN THE MINE:

Good environmental preservation of their mines and linked cement plants has been strategically given great importance as one of TRCL's corporate policy and accordingly the present environmental equilibrium in the area is being maintained within statutory standards. In future workings like in this proposed expansion project, the same strategic importance will be given for good environmental preservation.

Following are in brief, the control measures being and to be adopted in their mining operations for this project.

- Maintenance of AAQ levels within standards through dust suppression by water sprinkling, dust extraction system in drilling machines, dense afforestation in and around mine area, proper management of dumps by vegetation growth on slopes and construction of retaining walls and garland drains around dump areas, etc.
- Proper water management practices with domestic effluents outlets in septic tanks with pits, creation of garland drains around mine workings and dumps, construction of settling tanks of 2 numbers for collection of storm water, mine water, rainwater, etc, construction of check dams, etc, good rainwater harvesting practices, supply of mine pit water for dust suppression, green belt, etc.

- Noise control measures includes good preventive maintenance practices for all machineries, good greenbelt creation, controlled blasting with Shock tube detonating system and Non Electric surface blasting system for reducing vibration levels, prevent fly rocks, effective sorting of blasted stones, etc for vibration.
- Good dump management practices by proper angle of repose maintenance, terracing of dump top and creating masonry channels for regulating water flow through slopes, construction of garland drains, etc at dump bottom to arrest soil erosion, plantation on inactive dumps etc.
- Good land restoration methodologies adopted with good afforestation / plantation, growth in all possible, areas in as around the lease, including backfilling waste into 3.897Ha of mined out area, leaving a water reservoir in mine voids (the area between ML 13.50 to ML 21.00) to help recharge groundwater potential as well as for supply of water to nearby area.
- As a good corporate citizen, M/s.TRCL has carried out extensive and far reaching social and physical infrastructural improvement in the area on need based aspirations of local community. The Company had spent Rs.7.80 crores during the year 2014-15 towards Corporate Social Responsibility (CSR) through various community welfare measures including donations to temple, renovation of schools, construction of roads, sponsorship for sports and cultural activities cyclone / Tsunami donation etc. From Melavenkateswarapuram mine lease, during the year 2015-16 the Company had spent about Rs.21.96 lakhs for CSR activities and Rs. 20 lakhs per annum will allotted for the forthcoming years. The project also provides direct employment to 46 and indirectly to 200 persons for allied services.
- All above mitigative measures are elaborately described in Chapter IV later.

CHAPTER-III

EXISTING ENVIRONMENTAL SCENARIO

3.1 GENERAL:

The existing environmental data for the following Environmental components were collected in the study area:

- i. Socio-economic study
- ii. Micro-meteorological monitoring in one of the representative location
- iii. Ambient air quality study comprising gaseous, particulate matter at 6 different locations.
- iv. Water quality analysis in 5 different locations consisting of 4 Ground water (Bore wells) & one Mine Pit water
- v. Noise levels monitoring in 6 different locations
- vi. Soil quality analysis in 4 locations.
- vii. Flora & Fauna status.
- viii. Land use pattern study.
- ix. Hydrological profile.

The above mentioned studies have been carried out systematically and meticulously as per relevant IS codes, CPCB, MOEF&CC guidelines during Winter season (Dec 2013 – Feb 2014). The details of study are given in this chapter.

For the purpose of this study, the area has been divided into two zones, namely, core and buffer zones. Core zone is considered as the total lease area of Melavenkateswarapuram mines, while buffer zone encompasses an area of 10 km radius distance from the periphery of core zone.

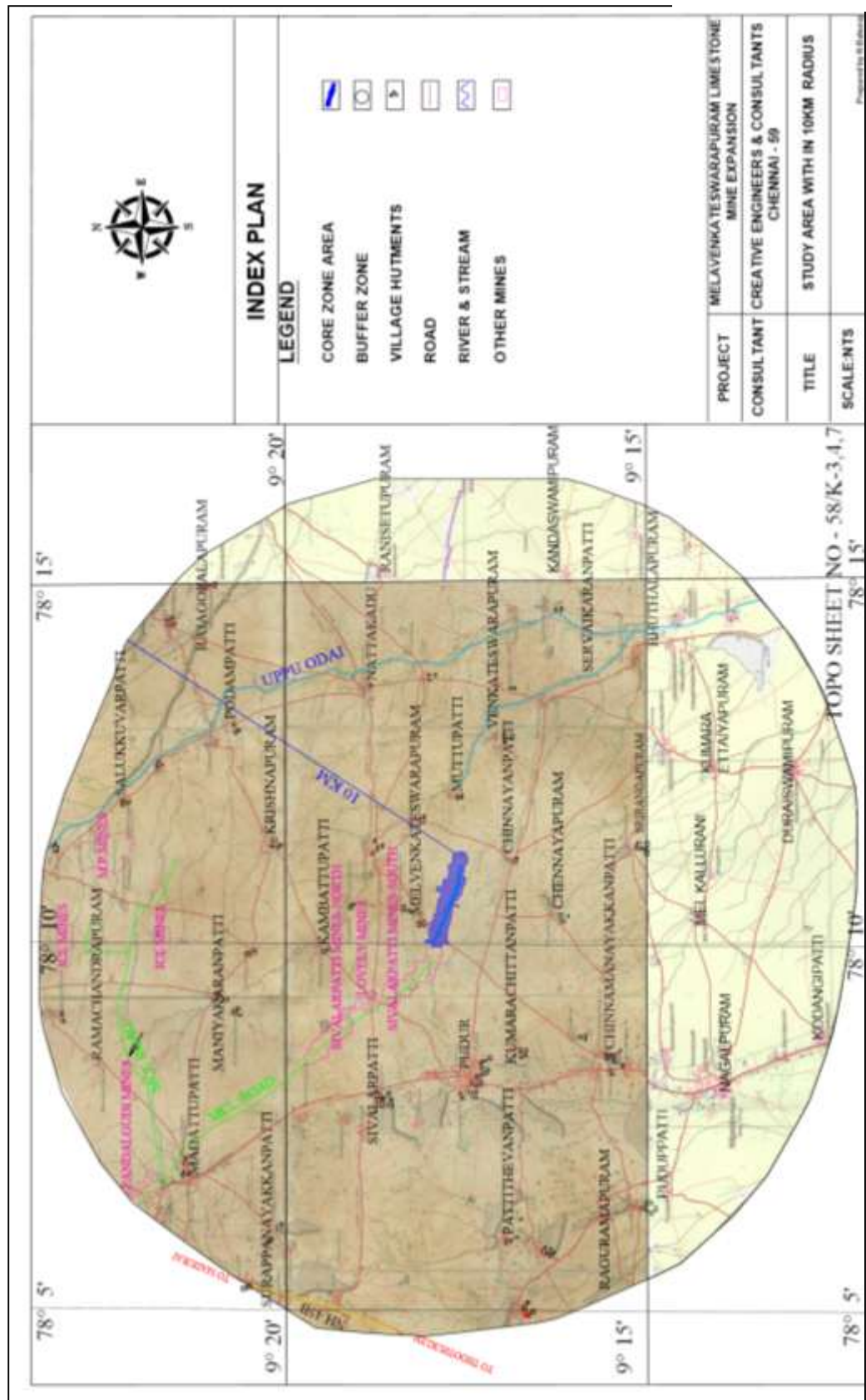
The details of villages falling in the study area and other features are given in Index Plan in **Figure No- 3.1**

3.1.1 Environment Setting of the Study Area – 10 Km Radius:

SL.No	PARTICULARS	DETAILS
1.	Mine site topography	53 to 60 above MSL
2.	Nearest Road	Pudur-Melavenkateswarapuram road
3.	Nearest highway	NH-45B (Madurai-Thoothukodi) 10.50 km NW
4.	Nearest Railway station	Aruppukottai (30 km)
5.	Nearest Airport	Madurai (75 Kms. From the Mines)
6.	Nearest major water bodies	Uppu Odai – 5 km
7.	Nearest town/City	Pudur
8.	Notified Archaeologically important places, Monuments	Nil within 10km radius
9.	Local Places of Historical and Tourism Interest	Nil within 10km radius
10.	Environmental sensitive areas, Protected areas as per Wildlife Protection Act, 1972 (Tiger reserve, Elephant reserve, Biospheres, National parks, Wildlife sanctuaries, community reserves and conservation reserves)	Nil within 10km radius
11.	Reserved / Protected Forests	Nil
12.	Defence Installations	Nil within 10km radius
13.	Seismic Zone	Zone – II (Least Active)
14.	Other Industries in the area	Sivalarpatti mines – NW & S, M.P Gudi mines - N; Lovely Mines - NW. Pandalgudi Mines – NW & ICL Mines – N.

INDEX PLAN

Figure No- 3.1



3.2. SOCIO-ECONOMIC CONFIGURATIONS OF THE AREA:

3.2.1 General:

The Socio-Economic details of the study area are gathered through:

- Identification of villages falling from the study area map with combined Taluk map.
- Collection of primary data through sample survey, village meetings and focused group discussion etc
- Collection of the demographic pattern of villages falling in the area through NIC 2011 census data.
- Occupational structure of villages falling in the study area through NIC 2011 census data.
- Details of the amenities available in villages falling in the study area through NIC 2001 census data.
- The study details are given below.

3.2.2 Secondary Data Description

Melavenkateswarapuram limestone mine is situated in Vilathikulam taluk, Thoothukkudi district, Tamilnadu state. Based on 2011 census, 37 rural villages including 1 town (V.Pudur) are falling within 10-km radius of this limestone mine. The 10-km radius study area is falling in Thoothukkudi and Virudhunagar districts and its details are given below:

Sl.No	KM. Radius	No. of Villages falling	Name of Taluk	District	State
1	0-2 KM	3	Vilathikulam	Thoothukkudi	Tamilnadu
2	2-5 KM.	4	Vilathikulam	Thoothukkudi	Tamilnadu
3	5-10 KM.	17	Vilathikulam	Thoothukkudi	Tamilnadu
		3	Ettayapuram	Thoothukkudi	Tamilnadu
		10	Aruppukkottai	Virudhunagar	Tamilnadu
4	Total	37	3 Taluks	2 districts	1 State

Population:

- The total population of these 37 villages is 60898 in which the male population is 49.7% (30282) and the female population is 50.3% (30616). This shows that the male and female population ratio is almost equal.
- Among the total population 0.01% (6) consists of Scheduled Tribes, 17.5% (10644) are of the Scheduled Caste population and 82.5% (50248) people belong to other castes mainly the Most Backward Communities and Backward Communities.
- Among the total population, 70.9% (43191) of the people are literate and 29.1% (17707) of the people are illiterate. This shows that nearly above 1/3 of the population is illiterate
- Among the literates 39.2% (23852) are males and 31.8% (19339) are females. This shows that the male literates are more than the female literates.
- Totally the illiterate constitute 29.1% (17707) of which the female cover 18.5% (11277) and the male 10.6% (6430). This shows that the female illiterates are more than the male illiterates.

Average Household Size

- The study area had an average family size of 3.7 persons per house hold on 2011. This is moderate family size and is in comparison with the other part of the district.

Population Density

- The density of population of the study area works out to about 220 persons per km²
- The village-wise population, literacy levels and occupational structure details are given in **Table No- 3.1 & 3.2**. The demographic structure within buffer zone is shown diagrammatically in **Figure No- 3.2 to 3.5**.

Figure No- 3.2

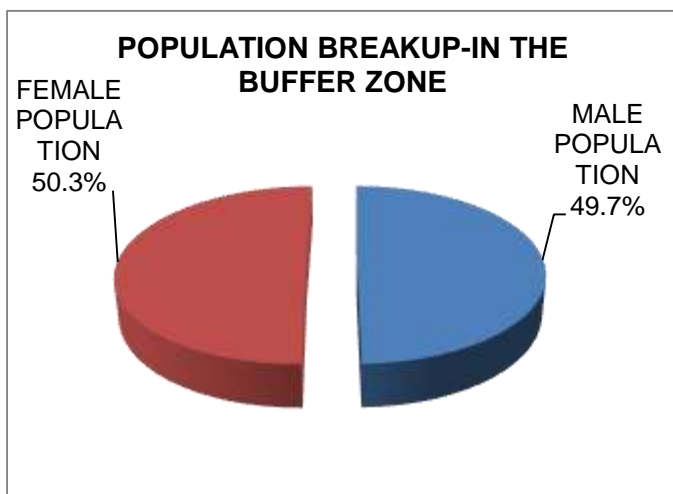


Figure No- 3.3

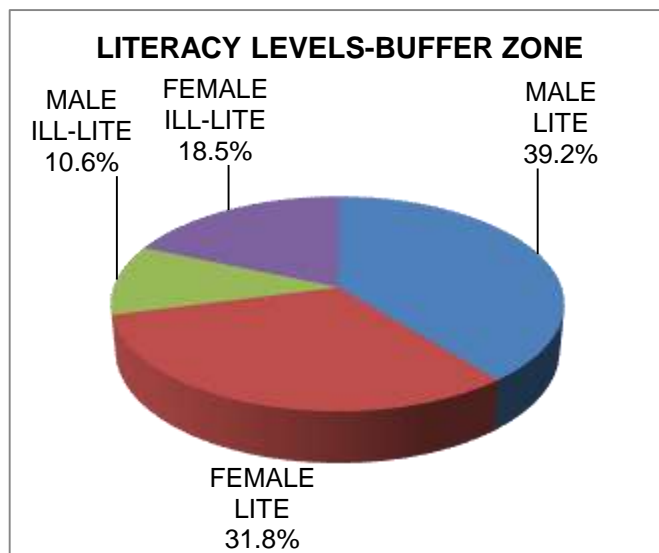


Figure No- 3.4

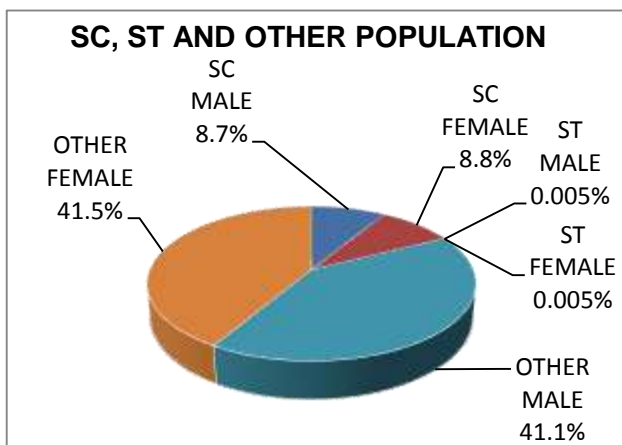


Figure No- 3.5

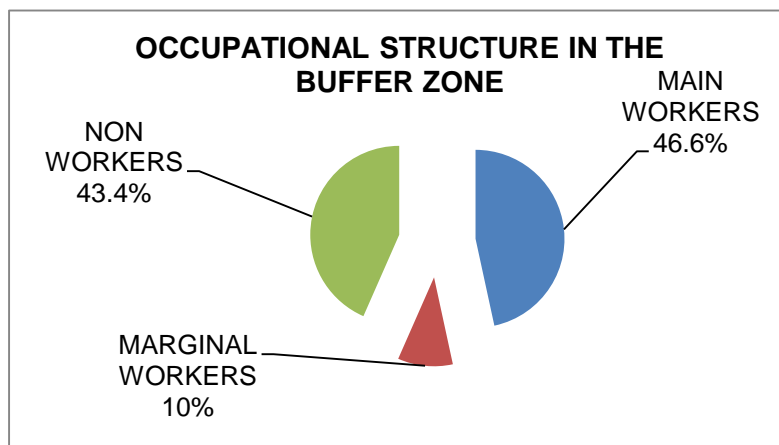




Table: 3.1

POPULATION BREAKUP & LITERACY LEVELS OF THE 10-KM RADIUS STUDY AREA OF THE PROJECT, AS PER 2011 CENCUS

Sl.N o.	Name of Village	TRU	No_ HH	TOT_ P	TOT_ M	TOT_ F	P_06	M_06	F_06	P_ SC	M_ SC	F_ SC	P_ ST	M_ ST	F_ ST	P_LIT	M_LIT	F_LIT	P_ILL	M_ILL	F_ILL
0-2 km.	Vilathikulam sub-district, Thoothukkudi district																				
1	Vannipatti	Rural	185	575	296	279	49	24	25	1	0	1	0	0	0	401	239	162	174	57	117
2	Nadukattur	Rural	461	1565	769	796	149	72	77	187	91	96	0	0	0	1084	603	481	481	166	315
3	Sennampatti	Rural	147	548	284	264	40	15	25	7	6	1	0	0	0	405	233	172	143	51	92
	Sub Total		793	2688	1349	1339	238	111	127	195	97	98	0	0	0	1890	1075	815	798	274	524
2-5 km.	Vilathikulam sub-district, Thoothukkudi district																				
4	Muthusampura m	Rural	496	1645	808	837	150	79	71	461	233	228	0	0	0	1126	618	508	519	190	329
5	Sivalarpatti	Rural	685	2430	1223	1207	223	122	101	431	221	210	0	0	0	1764	969	795	666	254	412
6	Madalapuram	Rural	573	2310	1150	1160	249	128	121	74	32	42	0	0	0	1518	868	650	792	282	510
7	V. Pudur (TP)	Urba n	2369	8891	4382	4509	950	472	478	1150	564	586	0	0	0	6413	3402	3011	2478	980	1498
	Sub Total		4123	15276	7563	7713	1572	801	771	2116	1050	1066	0	0	0	10821	5857	4964	4455	1706	2749
5-10 km.	Vilathikulam sub-district, Thoothukkudi district																				
8	Mettilpatti	Rural	768	2696	1364	1332	178	89	89	223	113	110	0	0	0	2020	1121	899	676	243	433
9	Maniakaranpatti	Rural	325	1028	505	523	81	38	43	73	31	42	0	0	0	658	376	282	370	129	241
10	Pattithevanpatti	Rural	270	974	492	482	103	57	46	83	41	42	0	0	0	689	391	298	285	101	184
11	Shencottai	Rural	208	676	333	343	66	37	29	128	64	64	0	0	0	461	255	206	215	78	137
12	Kumaralingapur am	Rural	40	181	89	92	24	10	14	0	0	0	0	0	0	110	65	45	71	24	47
13	P.Jagaveerapur am	Rural	73	281	131	150	24	12	12	1	0	1	0	0	0	198	104	94	83	27	56
14	Kandasampura m	Rural	317	1184	592	592	133	60	73	97	48	49	0	0	0	746	430	316	438	162	276
15	N.Jagaveerapur am	Rural	373	1461	745	716	175	84	91	125	61	64	0	0	0	1021	588	433	440	157	283
16	Boothalapuram	Rural	486	1637	806	831	151	87	64	319	163	156	0	0	0	1219	662	557	418	144	274
17	Melakallurani	Rural	281	1076	527	549	90	47	43	59	32	27	0	0	0	781	425	356	295	102	193
18	Shankaralinapur am	Rural	988	3801	1865	1936	386	189	197	445	220	225	0	0	0	2494	1418	1076	1307	447	860
19	Goundampatti	Rural	620	2260	1104	1156	231	107	124	854	405	449	2	2	0	1613	865	748	647	239	408
20	Vowalthothi	Rural	673	2351	1163	1188	190	96	94	1190	612	578	0	0	0	1652	930	722	699	233	466



Sl.N o.	Name of Village	TRU	No_HH	TOT_P	TOT_M	TOT_F	P_06	M_06	F_06	P_SC	M_SC	F_SC	P_ST	M_ST	F_ST	P_LIT	M_LIT	F_LIT	P_ILL	M_ILL	F_ILL
21	Nagalapuram	Rural	1212	4552	2310	2242	480	260	220	1774	876	898	4	1	3	3467	1891	1576	1085	419	666
22	M.Kodangipatti	Rural	388	1300	633	667	102	50	52	102	49	53	0	0	0	953	529	424	347	104	243
23	K.Duraisampura m	Rural	450	1653	826	827	142	79	63	311	156	155	0	0	0	1300	706	594	353	120	233
24	Mavilodai	Rural	171	665	319	346	73	35	38	124	55	69	0	0	0	398	217	181	267	102	165
Etayapuram sub-district, Thoothukkudi district																					
25	Kodangipatti (Vembur)	Rural	80	295	154	141	32	17	15	0	0	0	0	0	0	180	112	68	115	42	73
26	Vembur	Rural	688	2359	1182	1177	250	129	121	512	249	263	0	0	0	1528	865	663	831	317	514
27	Keelakarandai	Rural	317	1049	514	535	103	55	48	312	161	151	0	0	0	781	419	362	268	95	173
Aruppukkottai sub-district, Virudhunagar district																					
28	Maravarperungudi	Rural	430	1971	988	983	210	100	110	46	20	26	0	0	0	1395	807	588	576	181	395
29	Velayudhapuram	Rural	427	1553	784	769	105	60	45	122	70	52	0	0	0	1192	656	536	361	128	233
30	Thirumalaipuram	Rural	161	617	319	298	60	32	28	206	107	99	0	0	0	406	256	150	211	63	148
31	Salukkuvarpatti	Rural	230	896	475	421	75	44	31	114	58	56	0	0	0	645	370	275	251	105	146
32	Suthamadam	Rural	321	1161	571	590	116	61	55	94	51	43	0	0	0	882	488	394	279	83	196
33	Thoppalakarai	Rural	463	1899	925	974	226	124	102	256	119	137	0	0	0	1227	675	552	672	250	422
34	Rajagopalapura m	Rural	201	919	469	450	120	74	46	31	20	11	0	0	0	692	377	315	227	92	135
35	Pullanaickenpatti	Rural	239	870	433	437	88	51	37	95	45	50	0	0	0	682	358	324	188	75	113
36	Vadakkunatham	Rural	239	901	426	475	109	58	51	158	74	84	0	0	0	627	317	310	274	109	165
37	Therkunatham	Rural	206	668	326	342	60	34	26	479	231	248	0	0	0	463	247	216	205	79	126
	Sub Total		11645	42934	21370	21564	4183	2176	2007	8333	4131	4202	6	3	3	30480	16920	13560	12454	4450	8004
0-10 km.	Grand Total		16561	60898	30282	30616	5993	3088	2905	10644	5278	5366	6	3	3	43191	23852	19339	17707	6430	11277

Source: District Primary Census Abstracts-2011, Thoothukkudi and Virudhunagar districts of Tamilnadu State.



OCUPATIONAL STRUCTURE OF THE 10-KM RADIUS STUDY AREA OF THE PROJECT, AS PER 2011 CENCUS

Table: 3.2

SI.N o.	NAME OF VILLAGE	TRU	No_HH	TOT_P	TOT_M	TOT_F	TOT_W ORK_P	TOT_W ORK_M	TOT_WOR K_F	MAIN WOR K_P	MAIN WOR K_M	MAIN WOR K_F	MARG WOR K_P	MARG WOR K_M	MARG WOR K_F	NON_WOR K_P	NON_WOR K_M	NON_WOR K_F
0-2 km.	Vilathikulam Taluk, Thoothukkudi district.																	
1	Vannipatti	Rural	185	575	296	279	332	184	148	231	134	97	101	50	51	243	112	131
2	Nadukattur	Rural	461	1565	769	796	935	493	442	790	476	314	145	17	128	630	276	354
3	Sennampatti	Rural	147	548	284	264	313	179	134	248	164	84	65	15	50	235	105	130
	Sub Total		793	2688	1349	1339	1580	856	724	1269	774	495	311	82	229	1108	493	615
2-5 km.	Vilathikulam Taluk, Thoothukkudi district.																	
4	Muthusampuram	Rural	496	1645	808	837	1009	554	455	472	323	149	537	231	306	636	254	382
5	Sivalarpatti	Rural	685	2430	1223	1207	1560	839	721	1174	653	521	386	186	200	870	384	486
6	Madalapuram	Rural	573	2310	1150	1160	1449	753	696	511	340	171	938	413	525	861	397	464
7	V. Pudur (TP)	Urban	2369	8891	4382	4509	4036	2694	1342	3656	2574	1082	380	120	260	4855	1688	3167
	Sub Total		4123	15276	7563	7713	8054	4840	3214	5813	3890	1923	2241	950	1291	7222	2723	4499
5-10 km.	Vilathikulam Taluk, Thoothukkudi district.																	
8	Mettilpatti	Rural	768	2696	1364	1332	1688	907	781	1602	888	714	86	19	67	1008	457	551
9	Maniakaranpatti	Rural	325	1028	505	523	623	344	279	529	283	246	94	61	33	405	161	244
10	Pattithevanpatti	Rural	270	974	492	482	498	279	219	472	269	203	26	10	16	476	213	263
11	Shencottai	Rural	208	676	333	343	332	189	143	328	188	140	4	1	3	344	144	200
12	Kumaralingapuram	Rural	40	181	89	92	110	54	56	110	54	56	0	0	0	71	35	36
13	P.Jagaveerapuram	Rural	73	281	131	150	182	88	94	181	87	94	1	1	0	99	43	56
14	Kandasampuram	Rural	317	1184	592	592	728	386	342	720	384	336	8	2	6	456	206	250
15	N.Jagaveerapuram	Rural	373	1461	745	716	902	502	400	840	499	341	62	3	59	559	243	316
16	Boothalapuram	Rural	486	1637	806	831	1081	543	538	1009	511	498	72	32	40	556	263	293
17	Melakallurani	Rural	281	1076	527	549	739	368	371	392	206	186	347	162	185	337	159	178
18	Shankaralinapuram	Rural	988	3801	1865	1936	2329	1203	1126	2215	1177	1038	114	26	88	1472	662	810
19	Goundampatti	Rural	620	2260	1104	1156	1270	676	594	949	626	323	321	50	271	990	428	562
20	Vowalthothi	Rural	673	2351	1163	1188	1218	671	547	1194	664	530	24	7	17	1133	492	641



FINAL EIA/EMP REPORT FOR MELAVENKATESWARAPURAM LIMESTONE MINE OF LIMITED, EXTENT – 98.62 HA.

M/S. THE RAMCO CEMENTS

Sl.N o.	NAME OF VILLAGE	TRU	No_HH	TOT_P	TOT_M	TOT_F	TOT_W ORK_P	TOT_W ORK_M	TOT_WOR K_F	MAIN WOR K_P	MAIN WOR K_M	MAIN WOR K_F	MARG WOR K_P	MARG WOR K_M	MARG WOR K_F	NON_ WOR K_P	NON_ WOR K_M	NON_ WOR K_F
21	Nagalapuram	Rural	1212	4552	2310	2242	2152	1315	837	1509	1012	497	643	303	340	2400	995	1405
22	M.Kodangipatti	Rural	388	1300	633	667	646	400	246	568	378	190	78	22	56	654	233	421
23	K.Duraisamipuram	Rural	450	1653	826	827	1131	587	544	907	514	393	224	73	151	522	239	283
24	Mavilodai	Rural	171	665	319	346	423	215	208	352	198	154	71	17	54	242	104	138
Ettayapuram Taluk, Thoothukkudi district.																		
25	Kodangipatti (Vembur)	Rural	80	295	154	141	166	91	75	165	91	74	1	0	1	129	63	66
26	Vembur	Rural	688	2359	1182	1177	1348	722	626	1219	677	542	129	45	84	1011	460	551
27	Keelakarandai	Rural	317	1049	514	535	611	348	263	580	335	245	31	13	18	438	166	272
Aruppukkottai Taluk, Virudhunagar district.																		
28	Maravarperungudi	Rural	430	1971	988	983	1236	642	594	1226	636	590	10	6	4	735	346	389
29	Velayudhapuram	Rural	427	1553	784	769	986	523	463	362	183	179	624	340	284	567	261	306
30	Thirumalaipuram	Rural	161	617	319	298	332	172	160	329	170	159	3	2	1	285	147	138
31	Salukkuvarpatti	Rural	230	896	475	421	538	298	240	531	295	236	7	3	4	358	177	181
32	Suthamadam	Rural	321	1161	571	590	671	345	326	658	338	320	13	7	6	490	226	264
33	Thoppalakarai	Rural	463	1899	925	974	1051	555	496	1036	550	486	15	5	10	848	370	478
34	Rajagopalapuram	Rural	201	919	469	450	577	291	286	477	245	232	100	46	54	342	178	164
35	Pullanaickenpatti	Rural	239	870	433	437	419	234	185	122	93	29	297	141	156	451	199	252
36	Vadakkunatham	Rural	239	901	426	475	379	254	125	280	188	92	99	66	33	522	172	350
37	Therkunatham	Rural	206	668	326	342	456	223	233	427	207	220	29	16	13	212	103	109
	Sub Total		11645	42934	21370	21564	24822	13425	11397	21289	11946	9343	3533	1479	2054	18112	7945	10167
0-10 km.	Grand Total		16561	60898	30282	30616	34456	19121	15335	28371	16610	11761	6085	2511	3574	26442	11161	15281

Source: District Primary Census Abstracts-2011, Thoothukkudi and Virudhunagar districts of Tamilnadu State.



3.2.3 Occupational structure in the buffer zone:

- Among the total population nearly half of them are non-workers that is 43.4% (26442) and remaining half of them constitute the working population i.e. 56.6% (34456).
- Even among the working population 46.6% (28371) are main workers and 10% (6085) are marginal workers.

Educational Facilities:

- Regarding the educational facilities, among the 36 villages (except V.Pudur town), 35 villages have the educational facilities and only one village (Kumaralinga puram) don't have this facility, the children of this village have to travel a distance of 4 kms for getting educational facility from its neighborhood village.
- There are totally 80 Primary Schools functioning in these 36 villages. Among them 11 villages have one primary school, 3 villages namely Sivalarpatti, Vowalthothi and Nagalapuram each village have 4 primary schools, one village that Shankarlina puram have 5 primary schools and another one Velayudhapuram has 6 primary schools.
- Regarding the Middle school facility among these 36 villages, 17 villages have this facility and 19 villages do not have this facility.
- Similarly 6 villages have the high school facility; two villages Goundampatti and Nagalapuram have the higher secondary school in the area. For getting the vocational education and for college, they have to go to the nearby town that likes V.Pudur, Aruppukkottai and Virudhunagar.

Instead of these Muthusamy puram village has one Industrial school, and no other educational facilities/schools covered the 10-km radius of the project. Education facilities details are given in

Table No- 3.3

Details of primary schools in the buffer zone villages.

S.No	Villages	Number of primary schools	Totals
1	1	0	0
2	11	1	11
3	11	2	22
4	8	3	24
5	3	4	12
6	1	5	5
7	1	6	6
Total	36		80

Medical facilities:

Among 36 villages, 29 villages (rural) has the medical facilities in 10-km radius of the study area, and the urban towns namely V.Pudur (3-km.), Aruppukkottai (22-km.) and Virudhunagar district centre (within the 10-km radius study area) having the good medical facilities.

There is no Ayurvedic, Unony and Homeopathic hospital in all the 36 rural villages, but Nagalapuram village has one Allopathic hospital and V.Pudur town has good mediadl facilities.

Out of 36 rural villages no Allopathic, Ayurvedic and Unony dispensaries, but the Muthusamy puram has one Homeopathic dispensary.

Boothalapuram and Nagalapuram villages has maternity and child welfare centre (MCW) and these facilities does not available in 34 villages, all the villages has it in ranging villages, and one village (Muthusamy puram) has the Child welfare centre (CWC) from all 36 villages.

Primary Health Centre facilities are available in Boothalapuram, Nagalapuram and Thooppalakarai villages, and it is not available in 33 rural villages. The medical facilities details are given in **Table No- 3.4.**

Primary Health Sub centres are available in 10 villages and not available in 26 villages. And Family welfare centre (FWC), TB Clinic, Nursing home, Registered Medical Practitioners (RMP), Subsideised Medica Practitioners (SMP) are does not available in all the 10-km radius area of the project. The community health worker centres facility has 26 villages and 10 villages don't have these facility.

Infrastructure Facilities:

- All 36 rural villages have the drinking facility, Drinking water with tap facility also available in 33 rural villages. As per the secondary data, 19 villages have wells and 3 villages (Muthusampuram, Kumaralinga puram and P.Jagaveera puram) have the tank facility, but in sample survey maximum villages have the tank facility. At village level water tanks are need to be desilted and renovated (**Refer Table No- 3.5**).
- As far as tube well facility is concerned, all villages don't have this facility. Similarly 28 villages have hand pump facility and 8 villages do not have this facility, but recent survey shown all the villages have this facility. The secondary data shows that no river, canal, lake, spring and other facility in the study area.

Post office:

- Among the 36 villages 34 villages have post office facility and 2 villages (Vannipatti and Sennampatti) do not have this facility.

Telephone facilities

As per the secondary data 34 villages have phone facility and 2 villages do not have the phone facility. But the primary data collection shows all the villages have mobile services.

Bus Facility

Among 36 rural villages only 29 villages have Bus facilities, and 7 villages not have these facility.

Railway services

The secondary data showing none of the village have the railway services. But during the sample survey observation, all the 36 villages (within the 10-km radius of the project) have the railway services within 40-km of the distance from each village. The study area is not covering any of the village the navigable waterways.

Banks

Out of 36 the rural villages (within 10-km radius of project) 4 villages have the commercial banking facilities, and 11 villages have the Co-operative Bank service within the study area.

Table: 3.3

EDUCATIONAL FACILITIES AND CBOS WITHIN THE STUDY AREA

Sl. No.	Name of the Village	EDU_FAC	Primary School	Middle School	Secondary School	Senior Secondary School	College	Industrial School	Training School	Adult Literacy Centre	Other Educational Facilities
0-2 km.	Vilathikulam Taluk, Thoothukkudi district.										
1	Vannipatti	1	2	0	0	0	0	0	0	0	0
2	Nadukattur	1	3	1	0	0	0	0	0	0	0
3	Sennampatti	1	2	0	0	0	0	0	0	0	0
	Sub Total		7	1	0	0	0	0	0	0	0
2-5 km.	Vilathikulam Taluk, Thoothukkudi district.										
4	Muthusampuram	1	2	1	0	0	0	1	0	0	0
5	Sivalarpatti	1	4	1	0	0	0	0	0	0	0
6	Madalapuram	1	3	1	0	0	0	0	0	0	0
7	V. Pudur (TP)	* Town data not available									
	Sub Total		9	3	0	0	0	1	0	0	0
5-10 km.	Vilathikulam Taluk, Thoothukkudi district.										
8	Mettilpatti	1	2	1	1	0	0	0	0	0	0
9	Maniakaranpatti	1	3	0	0	0	0	0	0	0	0
10	Pattithevanpatti	1	1	0	0	0	0	0	0	0	0
11	Shencottai	1	1	1	1	0	0	0	0	0	0
12	Kumaralingapuram	2	0	0	0	0	0	0	0	0	0
13	P.Jagaveerapuram	1	1	0	0	0	0	0	0	0	0
14	Kandasampuram	1	2	0	0	0	0	0	0	0	0
15	N.Jagaveerapuram	1	2	1	0	0	0	0	0	0	0
16	Boothalapuram	1	3	1	0	0	0	0	0	0	0
17	Melakallurani	1	3	0	0	0	0	0	0	0	0
18	Shankaralinapuram	1	5	1	0	0	0	0	0	0	0
19	Goundampatti	1	2	2	2	1	0	0	0	0	0
20	Vowalthothi	1	4	1	0	0	0	0	0	0	0
21	Nagalapuram	1	4	3	2	1	0	0	0	0	0
22	M.Kodangipatti	1	3	1	0	0	0	0	0	0	0
23	K.Duraisamipuram	1	2	1	0	0	0	0	0	0	0
24	Mavilodai	1	1	0	0	0	0	0	0	0	0
	Ettayapuram Taluk, Thoothukkudi district.										
25	Kodangipatti (Vembur)	1	1	0	0	0	0	0	0	0	0
26	Vembur	1	2	1	1	0	0	0	0	0	0
27	Keelakarandai	1	1	0	0	0	0	0	0	0	0
	Aruppukkottai Taluk, Virudhunagar district.										
28	Maravarperungudi	1	3	1	0	0	0	0	0	0	0



**FINAL EIA/EMP REPORT FOR MELAVENKATESWARAPURAM LIMESTONE MINE OF
M/S. THE RAMCO CEMENTS LIMITED, EXTENT – 98.62 HA.**

Sl. No.	Name of the Village	EDU_FAC	Primary School	Middle School	Secondary School	Senior Secondary School	College	Industrial School	Training School	Adult Literacy Centre	Other Educational Facilities
29	Velayudhapuram	1	6	2	2	0	0	0	0	0	0
30	Thirumalaipuram	1	1	0	0	0	0	0	0	0	0
31	Salukkuvarpatti	1	3	0	0	0	0	0	0	0	0
32	Suthamadam	1	1	0	0	0	0	0	0	0	0
33	Thoppalakarai	1	1	0	0	0	0	0	0	0	0
34	Rajagopalapuram	1	2	0	0	0	0	0	0	0	0
35	Pullanaickenpatti	1	2	0	0	0	0	0	0	0	0
36	Vadakkunatham	1	1	0	0	0	0	0	0	0	0
37	Therkunatham	1	1	0	0	0	0	0	0	0	0
	Sub Total		64	17	9	2	0	0	0	0	0
0-10 km.	Grand Total		80	21	9	2	0	1	0	0	0

Source: District Primary Census Abstracts-2001, Thoothukkudi and Virudhunagar districts of Tamilnadu State.

***EDU_FAC**

1:Available

2:Not available



MEDICAL FACILITIES WITHIN THE STUDY AREA

Table: 3.4

Sl.No.	Name of the Village	M_F	A_H	AY_H	UN_H	HO_H	AL_DI_S	AY_DIS	UN_DI_S	HOM_DIS	M_CTR	M_H	CWC	H_CNT	PH_CNT	PHS_CT	FWC_CT	T_B_C	N_H	RMP	SMP	CH_W	OT_CT
0-2 km.	Vilathikulam Taluk, Thoothukkudi district.																						
1	Vannipatti	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
2	Nadukattur	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
3	Sennampatti	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	Sub Total		0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	3	0
2-5 km.	Vilathikulam Taluk, Thoothukkudi district.																						
4	Muthusampuram	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0
5	Sivalarpatti	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
6	Madalapuram	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
7	V. Pudur (TP)	* Town data not available																					
	Sub Total		0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	3	0
5-10 km.	Vilathikulam Taluk, Thoothukkudi district.																						
8	Mettilpatti	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0
9	Maniakaranpatti	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
10	Pattithevanpatti	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
11	Shencottai	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
12	Kumaralingapuram	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
13	P.Jagaveerapuram	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
14	Kandasampuram	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
15	N.Jagaveerapuram	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
16	Boothalapuram	1	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	1	0
17	Melakallurani	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
18	Shankaralinapuram	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
19	Goundampatti	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
20	Vowalthothi	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
21	Nagalapuram	1	1	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	1	0
22	M.Kodangipatti	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
23	K.Duraisampuram	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
24	Mavilodai	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	Ettayapuram Taluk, Thoothukkudi district.																						
25	Kodangipatti (Vembur)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
26	Vembur	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
27	Keelakarandai	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
	Aruppukkottai Taluk, Virudhunagar district.																						
28	Maravarperungudi	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
29	Velayudhapuram	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	Thirumalaipuram	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	Salukkuvarpatti	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	Suthamadam	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	Thoppalakurai	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0



SI.No.	Name of the Village	M_F	A_H	AY_H	UN_H	HO_H	AL_DIS	AY_DIS	UN_DIS	HOM_DIS	M_CTR	M_H	CWC	H_CNT	PH_CNT	PHS_CT	FWC_CT	T_B_C	N_H	RMP	SMP	CH_W	OT_CT
34	Rajagopalapuram	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	Pullanaickenpatti	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	Vadakkunatham	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
37	Therkunatham	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sub Total		1	0	0	0	0	0	0	0	2	1	0	0	3	10	0	0	0	0	0	20	0
0-10 km.	Grand Total		1	0	0	0	0	0	0	1	2	1	1	0	3	11	0	0	0	0	0	26	0

Source: District Primary Census Abstracts-2001, Thoothukkudi and Virudhunagar districts of Tamilnadu State.

*Note:

***MEDI_FAC 1:Available**
2:Not available

M-F : Medical Facilities	HO_DIS : Homeopathic Dispensary	FWC CNT : Family Welfare centre
AL_H : Allopathic Hospital	M_CTR : Maternity & Child Care centre	TB CLN : TB Clinic
AY_H : Ayurvedic Hospital	M -HM : Maternity Home	N-HO : Nursing Home
UN_H : Unani Hospital	CWC : Child Welfare centre	RMP : Registered Medical Pratitioners
HO_H : Homeopathic Hospital	H CNT : Health centre	SMP : Subsidized Medical Practitioners
AL_DIS : Allopathic Dispensary	PH CNT : Primary Health centre	CHW : Community Health Workers
AY_DIS : Ayurvedic Dispensary	PH CNT : Primary Health Sub centre	O-CNT : Other centres
UN_DIS : Unani Dispensary		



**FINAL EIA/EMP REPORT FOR MELAVENKATESWARAPURAM LIMESTONE MINE OF
M/S. THE RAMCO CEMENTS LIMITED, EXTENT – 98.62 HA.**

OTHER INFRASTRUCTURAL FACILITIES AVAILABLE IN THE STUDY AREA

Table: 3.5

Sl.No.	Name of the Village	DWF	Tp	W	TK	TW	HP	R	C	L	S	O	P O	TO	PT	P	B	RS	NW	CB	COB
0-2 km.	Vilathikulam Taluk, Thoothukkudi district.																				
1	Vannipatti	1	1	2	0	2	1	0	0	0	0	0	0	0	0	13	1	2	2	0	0
2	Nadukattur	1	1	2	0	2	1	0	0	0	0	0	1	0	0	3	1	2	2	0	1
3	Sennampatti	1	2	2	0	2	1	0	0	0	0	0	0	0	0	10	1	2	2	0	0
	Sub Total							0	0	0	0	0	1	0	0	26					
2-5 km.	Vilathikulam Taluk, Thoothukkudi district.																				
4	Muthusampuram	1	1	1	1	2	1	0	0	0	0	0	1	0	1	16	1	2	2	0	0
5	Sivalarpatti	1	1	1	0	2	2	0	0	0	0	0	1	0	0	42	1	2	2	0	2
6	Madalapuram	1	1	1	0	2	1	0	0	0	0	0	1	0	0	20	1	2	2	0	1
7	V. Pudur (TP)	* Town data not available																			
	Sub Total							0	0	0	0	0	3	0	1	78					
5-10 km.	Vilathikulam Taluk, Thoothukkudi district.																				
8	Mettipatti	1	1	1	0	2	1	0	0	0	0	0	2	0	0	40	1	2	2	1	0
9	Maniakaranpatti	1	1	1	0	2	1	0	0	0	0	0	1	0	0	10	1	2	2	0	0
10	Pattithevanpatti	1	1	1	0	2	1	0	0	0	0	0	1	0	0	4	1	2	2	0	0
11	Shencottai	1	1	2	0	2	1	0	0	0	0	0	1	0	0	14	1	2	2	1	0
12	Kumaralingapuram	1	2	1	1	2	1	0	0	0	0	0	1	0	0	1	2	2	2	0	0
13	P.Jagaveerapuram	1	1	1	1	2	1	0	0	0	0	0	1	0	0	3	1	2	2	0	0
14	Kandasampuram	1	1	2	0	2	2	0	0	0	0	0	1	0	0	4	1	2	2	0	0
15	N.Jagaveerapuram	1	1	1	0	2	2	0	0	0	0	0	1	0	0	1	2	2	2	0	1
16	Boothalapuram	1	1	2	0	2	1	0	0	0	0	0	1	0	0	11	1	2	2	0	1
17	Melakallurani	1	1	1	0	2	1	0	0	0	0	0	1	0	0	6	2	2	2	0	0
18	Shankaralinapuram	1	1	2	0	2	2	0	0	0	0	0	1	0	0	35	2	2	2	0	1
19	Goundampatti	1	1	2	0	2	2	0	0	0	0	0	1	0	0	20	2	2	2	1	0
20	Vowalthothi	1	1	2	0	2	2	0	0	0	0	0	1	0	0	46	1	2	2	0	1
21	Nagalapuram	1	1	2	0	2	2	0	0	0	0	0	1	0	1	159	1	2	2	1	1
22	M.Kodangipatti	1	1	2	0	2	1	0	0	0	0	0	1	0	0	10	1	2	2	0	0
23	K.Duraisampuram	1	1	2	0	2	1	0	0	0	0	0	1	0	0	12	1	2	2	0	0
24	Mavilodai	1	2	1	0	2	1	0	0	0	0	0	1	0	0	0	1	2	2	0	0
	Ettayapuram Taluk, Thoothukkudi district.																				
25	Kodangipatti (Vembur)	1	1	1	0	2	1	0	0	0	0	0	1	0	0	1	1	2	2	0	0
26	Vembur	1	1	1	0	2	1	0	0	0	0	0	1	0	0	23	1	2	2	0	1
27	Keelakarandai	1	1	2	0	2	2	0	0	0	0	0	1	0	0	27	1	2	2	0	1
	Aruppukkottai Taluk, Virudhunagar district.																				
28	Maravarperungudi	1	1	2	0	2	1	0	0	0	0	0	1	0	0	10	1	2	2	0	1
29	Velayudhapuram	1	1	2	0	2	1	0	0	0	0	0	1	0	0	14	1	2	2	0	0
30	Thirumalaipuram	1	1	2	0	2	1	0	0	0	0	0	1	0	0	3	1	2	2	0	0



**FINAL EIA/EMP REPORT FOR MELAVENKATESWARAPURAM LIMESTONE MINE OF
M/S. THE RAMCO CEMENTS LIMITED, EXTENT – 98.62 HA.**

Sl.No.	Name of the Village	DWF	Tp	W	TK	TW	HP	R	C	L	S	O	P O	TO	PT	P	B	RS	NW	CB	COB
31	Salukkuvarpatti	1	1	1	0	2	1	0	0	0	0	0	1	0	0	0	1	2	2	0	0
32	Suthamadam	1	1	1	0	2	1	0	0	0	0	0	1	0	0	2	1	2	2	0	0
33	Thoppalakurai	1	1	1	0	2	1	0	0	0	0	0	1	0	0	20	1	2	2	0	0
34	Rajagopalapuram	1	1	1	0	2	1	0	0	0	0	0	1	0	0	2	2	2	2	0	0
35	Pullanaickenpatti	1	1	2	0	2	1	0	0	0	0	0	1	0	0	7	2	2	2	0	0
36	Vadakkunatham	1	1	1	0	2	1	0	0	0	0	0	1	0	0	3	1	2	2	0	0
37	Therkunatham	1	1	1	0	2	1	0	0	0	0	0	1	0	0	1	1	2	2	0	0
	Sub Total							0	0	0	0	0	31	0	1	489					
0-10 km.	Grand Total							0	0	0	0	0	35	0	2	593					

Source: District Primary Census Abstracts-2001, Thoothukkudi and Virudhunagar districts of Tamilnadu State.

*Note :																					
*DWF_FAC																					
1:Available																					
2:Not available																					
DWF : Drinking Water Facility								C : Canal								P : Phone					
Tp : Tap								L : Lake								B : Bus					
W : Well								S : Spring								RS : Railway Service					
TK : Tank								O : Others								NW : Navigable Waterways					
TW : Tube Well								PO : Post Office								CB : Commercial Bank					
HP : Hand Pump								TO : Telegraph Office								CoB : Co-operative Bank					
R : River								PT : Post & Telegraph Offices													



VILLAGE-WISE LAND USE PATTERN AVAILABLE IN THE STUDY AREA

Table: 3.6

Sl.No.	VILL_NAME	AREA	Forest Land	Total Irrigated Land	Un-Irrigated Land	Cultivable Waste Land	Area not Available for Cultivation	Total Land
0-2 km.	Vilathikulam Taluk, Thoothukkudi distrct							
1	VANNIPATTI	925.36	0.00	0.00	735.59	139.14	50.63	925.36
2	NADDUKATTUR	1076.05	0.00	0.00	848.25	160.95	66.85	1076.05
3	CHENNAMPATTI	925.22	0.00	0.00	767.45	118.55	39.22	925.22
	Sub Total		0.00	0.00	2351.29	418.64	156.70	2926.63
2-5 km.	Vilathikulam Taluk, Thoothukkudi distrct							
4	MUTHUSAMPURAM	757.92	0.00	1.73	589.96	40.97	125.26	757.92
5	SIVALARPATTI	1490.89	0.00	15.00	990.97	356.42	128.50	1490.89
6	MADALAPURAM	1537.97	0.00	2.81	1083.61	263.40	188.15	1537.97
7	V.PUDUR (TP)	0						0.00
	Sub Total	0	0.00	19.54	2664.54	660.79	441.91	3786.78
5-10 km.	Vilathikulam Taluk, Thoothukkudi distrct							
8	METTIPATTI	2289.73	0.00	118.27	1596.04	464.92	110.50	2289.73
9	MANIYAKANANPATTI	938.27	0.00	0.00	699.68	206.57	32.02	938.27
10	PATTITHEVAR PATTI	365.58	0.00	25.90	265.72	38.83	35.13	365.58
11	SENKOTTAI	1097.98	0.00	68.22	283.64	606.61	139.51	1097.98
12	KUMARALINGAPURAM	107.86	0.00	0.00	61.69	0.00	46.17	107.86
13	JAGAVEERAPURAM	946.96	0.00	0.00	563.04	340.50	43.42	946.96
14	KANDASAMPURAM	971.92	0.00	0.00	782.82	135.68	53.42	971.92
15	JEEGAVEERAPURAM	1043.28	0.00	0.00	66.73	305.52	671.03	1043.28
16	BOOTHALAPURAM	1378.92	0.00	0.00	935.39	293.74	149.79	1378.92
17	MELAKKALLARANI	1398.38	0.00	0.00	1117.23	211.36	69.79	1398.38
18	SANKARALINGAPURAM	1098.21	0.00	30.61	779.31	220.21	68.08	1098.21
19	GOUDANPATTI	903.04	0.00	43.30	514.65	187.21	157.88	903.04
20	VOWALTHOTHI	1010.24	0.00	55.29	314.11	532.54	108.30	1010.24
21	NAGALAPURAM	680.35	0.00	9.78	370.82	215.59	84.16	680.35
22	KODANGIPATTI	1119.07	0.00	36.75	969.43	76.18	36.71	1119.07
23	DURAICHAMPURAM	1204.92	0.00	0.00	810.20	321.19	73.53	1204.92
24	MAVILODAI	1044.75	0.00	35.95	763.70	92.17	152.93	1044.75
	Ettayapuram Taluk, Thoothukkudi distrct							
25	KODANGIPATTI	186.60	0.00	11.80	52.01	70.60	52.19	186.60
26	VEMBOOR	1368.37	0.00	52.99	710.56	455.35	149.47	1368.37
27	KEELAKKARANDAI	1004.92	0.00	4.88	308.81	575.19	116.04	1004.92
	Aruppukkottai Taluk, Virudhunagar distrct							
28	MARAVARPERUNGUDI	1454.04		0.00	0.00	0.00	5.26	5.26
29	VELAYUTHAPURAM	1697.54		0.00	0.00	0.00	0.94	0.94
30	THIRUMALAIPURAM	545.41		0.00	0.00	0.00	162.99	162.99
31	SALUKKUVARPATTI	1177.40		0.00	0.00	0.00	34.16	34.16
32	SUTHAMADAM	1463.79		0.00	0.00	0.00	156.28	156.28
33	THOPPALAKKARAI	1076.72		0.00	0.00	0.00	102.40	102.40
34	RAJAGOPALAPURAM	706.83		0.00	0.00	0.00	136.86	136.86
35	PULLANAICKENPATTI	843.02		0.00	0.00	0.00	128.46	128.46
36	VADAKKUNATHAM	1023.54		0.00	0.00	0.00	4.04	4.04
37	THERKUNATHAM	1008.63		0.00	0.00	0.00	0.00	0.00
	Sub Total		0.00	493.74	11965.58	5349.96	3081.46	20890.74
0-10 km.	Grand Total		0.00	513.28	16981.41	6429.39	3680.07	27604.15

3.2.4 SAMPLE SURVEY:

3.2.4.1 OBJECTIVE:

Keeping in view the commitment of the organization towards social responsibility as well as to honor the sentiments and developmental needs of the local population, TRCL had planned to collect socio economic environment of the area adjoining its mine lease.

3.2.4.2 APPROACH:

In order to prepare a complete and comprehensive report, few villages were visited for conducting sample survey and a questionnaire on all socio-economic aspects was canvassed, including questions on the aspirations and requirements of the people for a better living.

Apart from this, village schedule was filled in order to capture the overall condition of the village with respect to community land, major crops produced, sources of irrigation, availability of potential earning opportunities in the vicinity, community institutions (schools, Anganwadi center, health sub-center, community center, places of worship, etc.), availability of electricity, provision of drainage and toilet facility etc.

3.2.4.3 COVERAGE:

Primary Data collection;

District: Thoothukkudi

Taluk: Vilathikulam

Panchayats: Sivalarpatti and Sennampatti,

Villages and hamlets visited: Kambattupatti (Sivalarpatti Panchayat), Ramalingapuram (Sennampatti Panchayat), and Melavekateshwarapuram (Sennampatti Panchayat).

Secondary data of the visited villages

Panchayat : villages	HH	Total Population	Male	Female	0-6 years age	SC Total	ST Total	SC&ST Total
Sennampatti	147	548	284	264	40	7	0	7
Sivalarpatti	685	2430	1223	1207	223	431	0	431
Total	832	2978	1507	1471	263	438	0	438

3.2.4.4 RESEARCH INSTRUMENTS USED:

It was a descriptive type of research study. Three types of research instruments were used in this study.

- **Field Visit**
- **Village Survey Schedule**
- **Village meetings and Focused Group Discussion on the environment and CSR activities**

The village visits, survey and discussions were carried out by CEC, collected the relevant data and also conducted Focus Group Discussions.

Two village panchayats for primary data collection, namely Sennampatti and Sivalarpatti and three hamlet villages, namely Kambattupatti (Sivalarpatti Panchayat), Ramalingapuram (Sennampatti Panchayat) and Melavekateshwarapuram (Sennampatti Panchayat) were selected.

Total 48 families were taken up for sample survey from four villages and the villagewise sample survey conducted families & their socio-economic profile as given below.

Sl.No.	Name of the village	No.of families	Total Population
1	Kambattupatti	12	51
2	Ramalinga puram	12	36
3	Sivalarpatti	12	40
4	Melavekateshwarapuram	12	36
	Total	48 (families)	163

Socio-economic analysis of the villages namely Kambattupatti, Ramalinga puram, Sivalarpatti and Melavekateshwarapuram were taken up as a part of the study. The data is based on the collection of village level information in sampled villages through primary data to understand the social conditions, the needs and aspiration of the people and to draw a programme for development.

These village panchayats are (within 0-5-km of the project) near by the mines and survey details are given below.

Demography Population distribution

Village	OC %.	BC %	SC %	ST %	Total %
Kambattupatti	6.3	18.8	0	0	100
Ramalinga puram	0	25.0	0	0	100
Sivalarpatti	0	18.8	6.3	0	100
Melavenkateshwarapuram	0	25.0	0	0	100
Total	6.3	87.4	6.3	0	100

Description of Primary Data

Towards Primary data collection, four panchayat villages namely Kambattupatti, Ramalinga puram, Sivalarpatti and Melavekateshwarapuram villages, were respectively covered. The data collected were from panchayat leaders and the village people.

Community :

Regarding the religion in these villages, majority of these villagers are Hindus, none of Christian community or Muslim community family was found during the sample survey.

Regarding the community all the villages have OBC, SC and General. The backward community is represented by Reddiyar (kanjan), Nayakar, Devar, Vadagan, Kammar and Maravan etc. The villages have more OBC's and General Caste's they belong to Reddiyar, Vadagan, Kammar, maravan and Devar caste. Four villages have more than 18% of Back word communities which include mainly Reddiyar (kanjan), Nayakar, Vadagan, kammar and maravan. Only Sivalarpatti village has 6.3% Scheduled Caste community, namely Arundhathiyar community, there are nearly 200 people altogether in these villages.

In all the villages, on an average the BC family consists of 87.4% while the schedule community people consist of 6.3% and the General Caste's constitute 6.3%.

Kambattupatti has 18.8%, Ramalinga puram has 25%, Sivalarpatti has 18.8% and Melavekateshwarapuram has 25% Backword Castes, and no ST community observed during the sample survey in four villages.

In Ramalinga puram and Melavekateshwarapuram villages have majority back word communities 25% and 25% and about schedule caste Sivalarpatti has 6.3%, instead of these Kambattupatti village only has 26.7% General caste community.

Village Name	OC	OBC	SC	ST
Kambattupatti	Devar	Nayakar	-	-
Ramalinga puram	-	Reddiyar (kanjan), Asari	-	-
Sivalarpatti	-	Vadagan, Kammalar, Maravan	Arundhathiyar	-
Melavekateshwarapuram	-	Nayakar, Devar	-	-

Occupation:

Village	Agriculture	Industrial Labours	Labours	Others	Govt Sec	Private sec	Total %.
Kambattupatti	16	0	0	34	0	1	51
%	31.4	0.0	0.0	66.7	0.0	2.0	100
Ramalinga puram	5	1	0	25	1	4	36
%	13.9	2.8	0.0	69.4	2.8	11.1	100
Sivalarpatti	2	0	1	31	3	3	40
%	5	0	2.5	77.5	7.5	7.5	100

Village	Agriculture	Industrial Labours	Labours	Others	Govt Sec	Private sec	Total %.
Melavekateshwarapuram	7	0	0	23	1	5	36
%	19.4	0.0	0.0	63.9	2.8	13.9	100
Total	30	1	1	113	5	13	163
Average total%	18.4	0.6	0.6	69.3	3.1	8.0	100

Agriculture is the main occupation in Indian villages. But in the studied area, only 18.4% of the people are involved in agriculture having lands in the nearby villages over an extent of 1-2 acres of land. 0.6% form Agriculture labourers in these villages.

Similarly 8% of people are engaged in private services which include staff and officers in the nearby mines. The number of people working in government services is 3.1% and the people working as others include house-hold workers, business, driving, child, old aged, un-employed and students are 69.3%.

Thus it is clear that the limestone mines provide the small employment opportunities to the people in the study area.

Income:

In all the villages, 30% of the people are living below poverty line, 35% of the people fall in low income group while only 35% of the people come under middle income group.

Education:

Village Name	Anganwadis	P.S	M.S	High School
Kambattupatti	1	1	-	-
Ramalinga puram	-	1	-	-
Sivalarpatti	1	1	1	-
Melavekateshwarapuram	-	-	-	-

There are 2 Anganwadi's in the studied villages which are functioning for the children in the age group of 0-5years. Ramalinga puram and Melavekateshwarapuram don't have Anganwadis, Sivalarpatti village and Kambattupatti each have 1 Anganwadi centre.

There are 3 primary schools functioning in three villages each namely, Kambattupatti, Ramalinga puram and Sivalarpatti villages. There is middle level government school present in Sivalarpatti. It is observed no high school in the surveyed four villages. For vocational, higher secondary and college educations, students go to V.Pudur, Aruppukkottai and Virudhunagar towns etc.

Health:

Village	RMP	PHC/dispensary	Village	Range	ANM
Kambattupatti	1	-	V. Pudur	6 km	available
Ramalinga puram	1	-	Chidambara puram	1 km	available
Sivalarpatti	1	-	V.Pudur	1.5 km	available
Melavekateshwarapuram	-	-	Melarunachala puram	1 km	available

Health:

Health care facility is mainly lacking in the studied area, none of the village have the dispensaries Primary Health Care Centre (PHC) among in these 4 villages.

For medical facility people living in Kambattupatti, Ramalinga puram, Sivalarpatti and Melavekateshwarapuram villages have to go to V.Pudur, Chidambara puram and Melarunachala puram PHC (1-6-km). In all four villages the ANM is visiting, three Registered Medical Practitioners used to come to Kambattupatti, Chettipati and Sivalarpatti, but in Melavekateshwarapuram village no RMP's visiting.

Infra structure Facilities

Sl. No		Kambattupatti	Ramalinga puram	Sivalarpatti	Melavekateshwara puram
1	Post Office	No	No	Yes	No
2	Electricity	Yes	Yes	Yes	Yes
3	Source of Drinking Water	OTH, hand pump, Bore well	OTH, hand pump, Bore well & pond	OTH, hand pump, Bore well & wells	OTH, hand pump, Bore well & pond
4	No. of Borewell, OHT & Tap Village Tank	1-OTH with 40 public taps, 2 small tanks & 3 hand pumps (not working)	1-OTH with 15 public taps, 1 small tank, 4 hand pumps & 1 pond	4-OTH with 45 private taps, 75 public taps, 2 small tanks & 8 hand pumps	1-OTH with 2 public taps, 3 hand pumps, 2 wells & 2 ponds
5	Transport (bus facility)	No (4-km range) Sivalarpatti	Bus facility available within the village	Bus facility available within the village	Bus facility available within the village
6	Cremation ground	Yes	Yes	Yes (2 places)	Yes
7	Community Hall	Yes (2)	Yes (1)	Yes (1)	No
8	Industries /Mines	Jayalakshmi spinning mill, jaya match works, muttukumar match works, Roja match (fire) works and	Jayalakshmi spinning mill, jaya match works, muttukumar match works, Roja match (fire)	Jayalakshmi spinning mill, jaya match works, muttukumar match works,	Jayalakshmi spinning mill, jaya match works, muttukumar match works, Roja match (fire) works and

Sl. No		Kambattupatti	Ramalinga puram	Sivalarpatti	Melavekateshwara puram
		Cenchuri match works	works and Cenchuri match works	Roja match (fire) works and Cenchuri match works	Cenchuri match works
9	Recreational facility	No	Yes (1-play ground in school)	Yes (1-library & 1 play ground)	No
10	Temples	1 Kali, 3 Ganesh & 1 Sivan	1 Kali, 1Vinayaka, 1 Ayyanar	Yes 11-hindu, 2-church	3 Perumal, 1 Vinayaga, 1 Mariamman
11	Banks	No. 6-km. range	No. 6-km. range	Yes (co-operative bank)	No. 4-km. range
12	Toilet	No	No	No	No

Infrastructure Facilities:

Post offices are present in 1 village, but there is no post office in Kambattupatti, Ramalinga puram and Melavekateshwarapuram. All the four villages have electricity facilities. Overhead tank (OTH), hand pump and bore well is the main source of drinking water in Kambattupatti and Melavekateshwarapuram villages, where as in Sivalarpatti, the source of water is OTH, mini tanks, hand pump bore wells and wells.

Regarding water facility with taps, Kambattupatti 40, Ramalinga puram 15, Sivalarpatti has 120, and Melavekateshwarapuram has 2 public tap facilities. Regarding the availability of bore wells, Kambattupatti and Ramalinga puram have 1 & 2 bore wells respectively. Regarding the OHT (overhead tank) & Tap facility, Kambattupatti has 1 OHT with 40 taps, Ramalinga puram has 1 OHT & 1 pond with 15 public taps, Sivalarpatti has 4 OHT with 75 public & 45 private taps and Melavekateshwarapuram has 1 OHT (overhead tank) with 2 public tap facility. Sivalarpatti has 2 mini tanks with 75 public taps, Ramalinga puram has 1 mini tank with 15 public taps, Kambattupatti has 2 mini tanks but Melavekateshwarapuram don't have this facility; but has 2 wells & 2 ponds.

Regarding the availability of village OHT & Mini tanks, Kambattupatti has 3, Ramalinga puram 2, Sivalarpatti has 6, and Melavekateshwarapuram has 1 OHT village tanks. Most of the tanks need desilting.

Transport Facility:

Among four villages three villagers have good transport facility through bus, but are inadequate because the bus comes only 3 trips per a day. Bus connecting to bigger towns like Thoothukkudi, Auppukkottai, and Madurai are nonfunctional. In Kambattupatti villagers, they have to go 6-km range (Sivalarpatti) for bus service.

Cremation Ground:

The entire sample surveyed villages, Kambattupatti, Ramalinga puram, and Melavekateshwarapuram has the cremation ground facility, but Sivalarpatti village has 2, it is different for different community people. People also burn the dead bodies in the village rivulets bed, and their own lands.

Community Hall:

Melavekateshwarapuram village only don't have the Community Hall, Ramalinga puram and Sivalarpatti have this facility and Kambattupatti village has 2 community halls for different communities and the Melavekateshwarapuram villagers stressed the need for this facility.

Industries /Mines:

Jayalakshmi spinning mill, jaya match works, muttukumar match works, Roja match (fire) works and Cenchuri match works are functioning, in the nearby area.

Recreational Facility:

From four surveyed villages' two villages namely Kambattupatti and Melavekateshwarapuram don't have the recreational facility like library or village level playground, but Ramalinga puram has 1 play ground in school and Sivalarpatti has 1 library and 1 playground.

Temples:

As majority of the people belong to Hindu religion, the villages have 24 Hindu temples altogether, in which Kambattupatti panchayat has 5 temples. Ramalinga puram Panchayat has 3 temples, Melavekateshwarapuram has 5 Hindu temples and Sivalarpatti village has 11 Hindu temples and 2 churches for different community people. The villagers celebrate the village temple function during August and April.

Banks:

Regarding bank facility, 1 Co-operative Bank facility is available in Sivalarpatti village, the surveyed four villages, two villagers have to go Sivalarpatti, It is distance for Kambattupatti 6-km, and for Melavekateshwarapuram 2-km.

Lavatory Facility:

Lavatory facility is not at all available in all the villages. Even through some major villages like Sivalarpatti has the public lavatory facility, but it is not functioning and is under repair. As there is no water facility available in these lavatories and there are no proper persons appointed for clearing or maintaining, the lavatories are not functional. This is the most basic felt need of the people, which needs to be addressed immediately.

Cropping Pattern:

Among the 4 studied villages, villages namely Kambattupatti, Sivalarpatti and Melavekateshwarapuram villages have block soil and Ramalinga puram village has red soil.

Regarding the cropping pattern, it was observed that cultivating land is available and it was totally single crop land, all the four villages some people are cultivating green vegetable, Jawar, Mize, paddy and cotton.

The farmers are using chemical fertilizers, insecticides and pesticides. They use meager amount of natural manure.

Food Pattern:

In all the villages, generally they cook food two times, that is in the morning and evening and the food consists of mainly of rice (Semi solid watery dish with dhal and vegetables in it). Only 40% of the people consume Tiffin items – such as idly, dose, poory and vada etc.

Regarding the fuel use pattern 70% of the people are using firewood, 10% of the people use kerosene and 20% of the people use the LPG.

Livestock details:

The types of livestock common in these villages are cows, buffaloes, goats, sheep, and chicken. There are 799 live stocks present in these villages in which 65 (8.1%) are the cows and buffaloes: 582 (72.8%) are goats and sheep's: none of pig found in during the sample survey and the chicken constitute 152 (19%).

The common diseases for the animals are Komari, Anthrox, foot and mouth diseases etc. The government veterinary hospitals are in V.Pudur and Vilathikulam which are about 4-17-kms distance from the studied villages. On request, veterinary camp is arranged in the villages once in a year with a help of government doctor. Often on phone request, private doctor used to visit & treat the animals during the urgent need.

S.No	Type of live stock	Total	Kambattupatti	Ramalinga puram	Sivalarpatti	Melavekateshwarapuram
1	Cows/buffaloes	65	53	6	0	6
	%	8.1	81.5	9.2	0.0	9.2
2	Goat/Sheep	582	446	72	24	40
	%	72.8	76.6	12.4	4.1	6.9
3	Pig	0	0	0	0	0
	%	0	0	0	0	0
4	Chicken	152	57	95	0	0
	%	19	37.5	62.5	0	0
5	Total	799	556	173	24	46
	%	100	69.6	21.7	3.0	5.8

Employment opportunities:

Though agriculture is the main occupation, in the studied villages it has provided employment opportunities to 60-70% of the families.

The remaining population is depending on the other type of employment opportunities mainly as labourers. These opportunities are provided by surrounding industries are Jayalakshmi spinning mill, jaya match works, muttukumar match works, Roja match (fire) works and Cenchuri match works, Melavenkateswarapuram and Sivalarpatti mines.

In each village about 10 people are getting employment opportunities as daily wage earners in TRCL mines and allied operations.

Social services needed:

The following are the needs felt by the people.

Kambattupatti:

- Drinking water facility in school, village level playground,
- Drinking water facility in village, install drinking water plant in the village
- Provide the bus facility for transportation.
- Repair the village hand pumps & construct a pond for livestock drinking water purpose.
- Up gradation of school from primary to middle school, construction of new school building, playground, library, computers and playing things for the school.
- Educational drawing should be done on the compound wall. Village roads need to be improved further for better transport services.
- Lavatory facility for all houses.
- Drinking water through another OHT (overhead tank) Taps.
- Arrange for public lavatory facility & Taps.
- Need PHC (primary health centre)

Ramalinga puram:

- Health facility either through regular or through mobile health services.
- Need Anganwadi centre for below 5 years children
- Irrigation facility need for agriculture.
- Veterinary health services for the livestock
- Providing proper drinking water facility with house hold taps.
- Toilet facility with water facility separate for ladies and gents.
- Need health care centre.

- Providing road and transport facility.
- Need village library and postal services.

Sivalarpatti:

- Electricity facility, drinking water, fans and kids playing things for Anganwadi centre,
- Up gradation middle school to high school.
- Separate public toilets for ladies and gents
- Another cremation ground, community hall and OTH
- New panchayat building and Gym
- Renovate of agriculture canal
- Provide additional overhead tanks (OTH) with taps.
- Lavatories with water facility for all houses.
- Providing proper drinking water facility with house hold taps.
- Professional training centres for women & un employed youth
- Need cement roads and village level playground.

Melavenkateshwara puram:

- Community hall, Water facility for school, Toilets in villages,
- Need Anganwadi centre for below 5 years children
- Up gradation of school from primary school to high school, playground for the school.
- New school building.
- Need renovation for village pond.
- Educational drawing should be done on the compound wall. A village road needs to be improved further for better transport services.
- Need another OHT (overhead tank) with tap connections.
- Toilet with water facility for all houses.

FOCUSSED GROUP DISCUSSION

Two village meetings were conducted for Kambattupatti, Ramalinga puram, Sivalarpatti and Melavenkateshwarapuram. Focused Group discussion was held for Kambattupatti and Ramalinga puram panchayat people. Nearly 20-30 people from each village including the panchayat president, village women, youth, elders, school teachers had participated and discussed.

Kambattupatti:

- People living in Kambattupatti reported that TRCL are carrying out CSR activities in their villages, but it's not enough, people are suffering from unsafe drinking water facility and improper transportation facility.
- The village has received medical camps and educational support from TRCL project proponents.
- Health Care is lacking and the nearby PHC is 2-Kms away from this village. Similarly health awareness meetings and training are needed for the people, particularly health awareness, reproductive child health and gynecological problems of the women need to be addressed.
- There are no toilets at least common toilets with water facilities. Hence, common toilets with water facilities are also the felt needs of the people, which should be addressed.
- People informed that the present school building condition is in very poor and need new building for student.
- The village has one primary school with no adequate transport facility presently available. The people desired that the existing Primary school needs to be upgraded to middle school level. The school building needs renovation and also basic facilities are to be made available within the school for children.
- The village water tanks needs be renovated or desilted to improve the water storage and usability of these tanks which would address the water scarcity problems of these villages.
- People reported that due to mining blast their houses are patricianly damaged.

Ramalinga puram:

- The people also said that the company has conducted medical camps, provided educational assistance to school children and generous donations for the temple festival.
- Due to mining activity. The people have reported Asthma and other respiratory complaints.
- People informed that due to mining, the ground water level is decreased.
- People requested for repair of village roads, as the same is getting damaged due to transport activities of both the companies

- People reported for road, drinking water facility, and need recreational facility within the village, and school is essential upgrade to high school.

Focussed Group Discussion in Sivalarpatti and Melavenkateshwarapuram village panchayats.

Focused Group Discussion was held in two village panchayats namely Sivalarpatti and Melavenkateshwarapuram.

Sivalarpatti:

- The people have reported that the mining companies have improved their employment and trade opportunities.
- Due to of mining, villagers reported that income and the revenue generation in the village have improved.
- **Water Facility** :The company has helped them to improve the water facilities by providing bore wells, hand pumps & OHT in all the hamlets of Sivalarpatti
- **Education**: The Company is providing notebooks to school going students. It has also helped to upgrade the primary school to middle school and also constructed compound wall and provided gate in the school.
- **Health**: The people of Sivalarpatti informed that it is a major village panchayat and covering 3 hamlet villages namely Kambattupatty, Subbulapuram and Melapuram; and they need primary Health Care Centre within the village presently people are going to V.Pudur (1.5-km) for medical facilities. TRCL is conducting medical camps once a month. It is also conducting free eye camp for the people once in a year; more than 400 people are getting benefited through this arrangement.

Further CSR activities requested:

- In Sivalarpatti people reported that the coming years, they wanted the company to help them to upgrade their middle school to High or Higher secondary school, to improve the water facilities in the toilet, to provide play ground in the school, construction of compound wall for the school, additional community hall construction, to provide more number of toilets with water facility and also to improve the overall health and hygiene of the village.

Melavenkateshwarapuram village:

- Melavenkateshwarapuram people acknowledged that TRCL has helped for primary school providing chairs, play material and uniforms to children.
- Not satisfied with the education provided in the Government school of their village.

- The people requested for more developmental services from the management like provision of hand pumps in the panchayat, especially in Melavenkateshwarapuram village.
- They don't have library, community hall and playground facilities. The people have stressed that they are in need of public toilets with water facility, better roads, and up gradation of primary school to middle school.
- Regarding the health care, Since the existing health care centre is not functioning they requested for frequent mobile clinics visits from the Company

CSR works already carried out.

TRCL limestone mines have been involved in doing excellent Social Service in and around the villages of its mines and factory. It has been involved in developing health, education, skill development, environment and spiritual development of the society.

Suggestions for improvement of CSR activities:

The future CSR activities can be planned based on the need of the locals assessed during the survey. Some of the salient activities are listed below:

- Desilting of village level tanks which give sustainable use of water to the villagers and to their livestock.
- Instead of regular health camps, among them, one in each quarter can be changed to health camp particularly for women alone, with particular focus on identification of reproductive tract infections and identification of uterus cancer and others. This will help a lot for a family to identify the cancer or other infections in the earlier stage and avoid bigger health and economic risks at a later stage.
- Similarly health awareness meetings for women on the reproductive health and anemia will give lot of qualitative improvement in the health of women.
- The social investment on providing capacity building trainings and strengthening of CBO's activities.
- The present health care and village camps which are conducted in the mornings can be conducted in the evening then lot of people including school going children and working people and women will get benefitted.
- Distribution of vitamin and de worming tablets to Anganwadi and school going children, distribution of iron tablets to women will bring a tremendous change in the health of women and children.

- Fruit distribution to Anganwadi children on certain days in a week, construction of baby friendly toilet with water facility in the Anganwadi etc will have positive impact.
- Providing skill trainings in greeting card making, Jam, squash, pickle, basket making for the rural women and then purchasing the products for company's canteen after quality checks will improve the skill and provide employment opportunity of the rural women & adolescent girls.
- Further improvements in the infrastructural and other amenities provided to the locals.

3.2.5 HEALTH CARE:

The health status of the area is deciphered from the discussion and data collection from the nearby Primary Health Centre at Pandalgudi, Virudhunagar District, Health care services of TRCL and discussion with locals.

Pandalgudi PHC, Aruppukottai Block, Virudhunagar District has been catering to the health service needs of 32 villages in 12 Panchayats. 5 Health sub-centres operate under this PHC. 30 Community Nutrition Centres, 30 Chief Minister Noon Meal Centres and 35 Schools (which includes 25 Primary Schools, 3 Middle Schools, 3 High Schools, 3 Higher Secondary Schools and 1 College) have been benefited under this PHC.

Apart from the PHCs, private clinics are also functioning in the village. There are adequate medical shops in the village. Apart from PHC, one G.H. at Aruppukottai has been functioning efficiently to address the health care needs of mother and child.

Details of diseases observed in the Pandalgudi PHC is given in **Table 3.7**.

From the table and the discussion with the locals and the medical attendants the following are observed:

- Only common ailments like cold, cough are prevalent.
- Pandalgudi unit is equipped with two dedicated staff for treatment of T.B which is mainly due to usage of tobacco. Patients number has drastically come down probably due to awareness amongst the locals.
- Public also registered their views that their health has not been affected largely by mining activities.
- The health care for pre-schoolers has been adequately attended to and taken care by Child Welfare Centres.
- Locals especially elderly women are poor in maintaining the personnel hygiene.

Table showing the details of diseases observed in the PHC Pandalgudi Table: 3.7

FORMAT FOR COLLECTION OF DATA FROM THE PHC

Name of Primary Health Centre	Village	Taluk	Cold & Cough	Gastric	Diarrhoea	BP	TB	Asthma	Sugar	Pneumonia	Chronic Bronchitis	Heart Disease	Total No. of Patient
Pandalgudi PHC													
2016			48550	20140	9	5269		1400	1800	2051	140	38045	93850
2015			46450	18650	3	60118		918	71640	1656	120	2	93660
2014			49350	19450	5	51840		1040	6850	1550	110	4	92450
2013			38660	2004	6	48416		920	6650	1851	145	3	90560
2012			37560	18450	8	26319		1014	72330	2228	130	4	79990
2011			38450	19660	6	38422		830	68340	1040	160	2	80668
2010			41460	20640	5	30164		1414	64440	1436	140	3	76967
2009			40350	19450	6	33169		1050	68540	1040	120	1	73450
2008			38660	18430	8	30416		9506	63350	838	110	3	74360

Medical Camps for Villagers:

Medical camps are conducted by TRCL periodically in the nearby villages. The medical team comprises atleast 1 medical officer, 1 lady doctor from PHC, 1 pharmacist, 1 staff nurse and about 15 volunteers.

Details of medical camps conducted are given below:

Year 2012

S. No	Dates	Village	Patients Attended	Type of Camp	Diagnosis
1.	20.01.2012	Pandalgudi	308	Eye Camp	29 diagnosed with Cataract
2.	06.03.2012	Maravarperungudi	256	General Camp	--
3.	05.05.2012	Keelaarunachalapuram	178	General Camp	--
4.	29.07.2012	Pudhur	311	General Camp	
5.	09.09.2012	Chennareddipatti	157	General Camp	3 Cataract, 7 B.P. and 1 Hernia patient identified
6.	07.10.2012	Subbalapuram	139	General Camp	3 Diabetics and 3 Cataract patients identified
7.	02.11.2012	Melachakkannapuram	159	General Camp	4 Cataract and 2 persons with Heart ailments identified
		Total	1508		

Year 2013

S. No	Dates	Village	Patients Attended	Type of Camp	Diagnosis
1.	10.01.2013	Chennampatti	162	General Camp	
2.	06.03.2013	Maravarperungudi (surrounding villages)	252	General Camp	
3.	28.04.2013	Kambathupatti	114	General camp	
4.	29.06.2013	Muthusamypuram	101	General Camp	4 cataract, 1 cancer patient identified
5.	13.07.2013	Pandalgudi	140	Eye Camp & General Camp	-
6.	28.09.2013	Suddhamadam	105	Eye Camp	4 Cataract and 2 persons with Heart ailments identified
7.	28.12.2013	Kasilingapuram	112	General camp	
		Total	986		

Year 2014

S. No	Dates	Village	Patients Attended	Type of Camp	Diagnosis
1.	18.01.2014	Kilaarunachapuram	140	General Camp	9 Cataract Eye, 12 Diabetic, 8 BP, 2 Fungal infection & 1 Hernia
2.	15.03.2014	Kurundamadam	190	General Camp	4 Vision problems, 10 Diabetic, 13 BP 2 Skin rashes & 1 Septic abscess
3.	07.06.2014	Vadakkumuthyapuram	125	General camp	4 Cataract Eye, 8 Diabetic & 9 BP
4.	19.07.2014	Pudur	210	Eye Camp	9 Cataract Eye, 2 Squint, 19 Refraction & 6 Infection BE
5.	09.08.2014	Koppuchitampatti	131	General Camp	9 Diabetic Noticed, 19 HT noticed, 1 Appendicitis, 2 Chronic ulcer Stomach and 16 Cataract
6.	30.09.2014	Periyathummakundu	142	Eye Camp	18 Cataract Eye, 6 Refraction, 3 DM & 11 HT
		Total	938		

Year 2015

S. No	Dates	Village	Patients Attended	Type of Camp	Diagnosis
1.	14.02.2015	Ramconagar, Pandalgudi	180	General camp	Dengue fever awareness program
2.	28.04.2015	Andipatti	75	General camp	16 Cataract Eye & 4 Refraction
3.	27.05.2015	Melaarunachapuram	96	General camp	5 Cataract Eye, 21 HT, 13 DM & 1 Septic wound
4.	20.06.2015	Sivalarpatti	125	General camp	17 DM, 13 HT, 6 Cataract Eye, & 1 Chronic vertigo
5.	25.07.2015	Kulakattankurichi	111	General camp	14 DM, 10 HT, 1 Squint & 1 Hearing loss
6.	22.08.2015	Melavenkateswarapuram	95	General camp	10 DM, 9 HT, & 6 Cataract
7.	15.09.2015	Senniyampatti	110	General camp	8 DM, 13 HT, 3 Dental Caris, 2 Skin infection,

S. No	Dates	Village	Patients Attended	Type of Camp	Diagnosis
					3 Tonsillitis & 6 Cataract
	22.11.2015	Pudur	60	Eye Camp	23 Cataract Eye, 18 Refraction & 1 Fondus
		Total	852		

Year 2016

S. No	Dates	Village	Patients Attended	Type of Camp	Diagnosis
1.	29.03.2016	Muthupatti	82	General camp	18 DM, 17 HT, 3 Septic wound, 1 & 12 Vision problem
2.	04.05.2016	Maniyakaranpatti	113	General camp	12 DM, 10 HT, 4 Cataract Eye & 1 Infection eye
3.	20.05.2016	Thavasilingapuram	135	General camp	11 DM, 14 HT, & 5 Cataract Eye
4.	27.05.2016	Melakumarasakkanapuram	103	General camp	9 DM, 13 HT, 4 Cataract Eye & 1 Clubbed Lips
5.	22.06.2016	Mettilpatti	156	General camp	6 Cataract, 17 DM, 15 HT, 1 Cellulites & 1 Septic Wound
6.	24.06.2016	Chennamareddipatti	152	General camp	12 DM, 17 HT, 8 Poor vision, 2 Piles and 1 Skin allergy
7.	31.07.2016	Pandalgudi	122	General camp	8 DM, 12 HT, 6 vision issues and 1 Hearing loss
8.	01.09.2016	Velayuthapuram	119	General camp	9 DM, 16 HT, 3 Refraction, 2 Tonsillitis and 7 Cataract
9.	09.09.2016	Udayanathapuram	116	General camp	8 DM, 13 HT, 5 Cataract Eye & 3 Fever
		Total	1098		

From the above it could be seen that about 1000 locals were benefitted every year due to the medical camps conducted by TRCL. These camps were conducted in different villages on a rotational basis.

Medical Aid from TRCL:

After medical camps, the diagnosed persons were also provided with other help based on the need like:

- Patients identified with Cataract would be getting treatment free of cost i.e. cost of eye operation, food, transport and other medical expenses will also be free of cost.
- 60 % of treatment cost would be borne by TRCL for needy patients identified with major diseases.
- More than 5300 locals have benefitted in last 5 years

Suggestions:

- Medical camps can be arranged in the evening to facilitate the needs of working population and school going children.
- Mobile medical camps may be introduced which can address the health issues of many villages.
- Health awareness and education programmes may be conducted
- Special screening camps to identify Breast and Cervical Cancer may be organized for women.
- Special Eye Camps for school children may also be organized.

Health Care Services by The Ramco Cements Limited::

TRCL has been operating a dispensary in the factory for supporting the health care needs of employees and their families. Staff support ably provided by one medical officer, and a pharmacist and other supporting staff. Periodic Health tests (Pulmonary test, Audiometric test, blood test, chest x-ray examination etc.) have been conducted every year for 20% of TRCL employees. Supported by test observations, adequate and need based treatment has been offered to employees. No incidence of occupational related diseases observed during the observation of staff so far.

3.3 PRESENT ENVIRONMENTAL QUALITY:

3.3.1 MICRO-METEOROLOGY:

3.3.1.1 GENERAL:

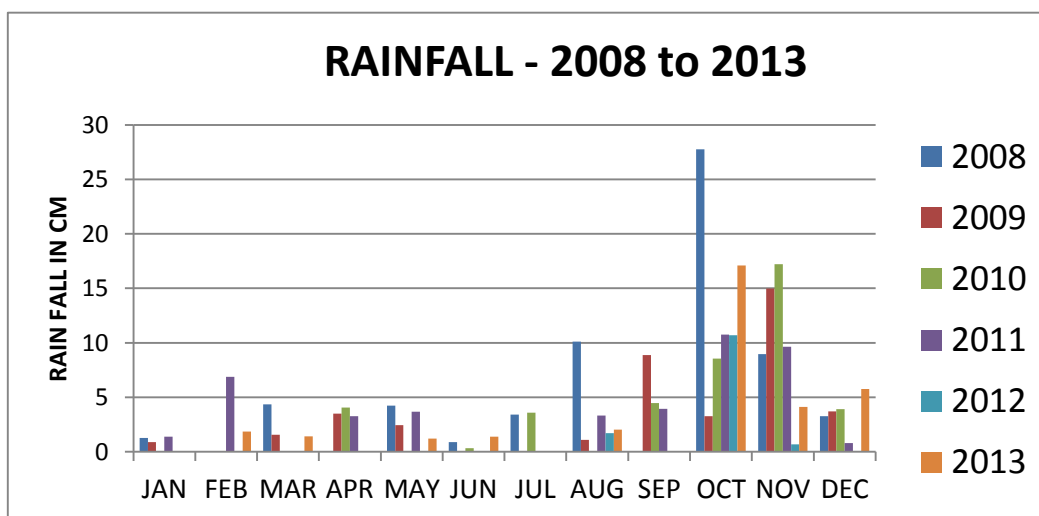
The meteorological conditions in an area regulate the transport and diffusion of air pollutants released into the atmosphere. The principal variables include horizontal convective transport i.e. wind speed and direction; vertical convective transport i.e. mixing height, stability class and topography of the area. Hence, these data are very important for proper interpretation of the baseline information as well as for input prediction for air quality prediction models. Hence the site specific details are collected and the details are as below:

3.3.1.2 HISTORICAL AND SITE SPECIFIC METEOROLOGICAL DATA:

a. HISTORICAL DATA:

The nearest Rainfall gauge station is located at Aruppukottai which is at a distance of about 25 km on the North from the **Melavenkateswarapuram** Mine. The Fifty years of Normal Rainfall recorded is 769 mm out of which, normal NE Monsoon Rainfall is 392.0 mm (Oct-Dec) Normal SW Monsoon Rainfall is 184.0 mm (Jun-Sep) Transit period rainfall from Jan to May is 193.0 m.

The rainfall data monitored near the mine site shows that the average rainfall between 2008- 2014 is 460 mm only.



b. SITE SPECIFIC METEOROLOGICAL DATA:

The micrometeorology and microclimatic parameters were recorded by installing a weather monitoring station near pudur village at about 8 m height. Data on wind velocity, wind direction, ambient temperature and relative humidity were recorded at hourly intervals throughout the monitoring period.

Location of micro-meteorological station is shown in **Figure No- 3.6**

3.3.1.3 DATA ANALYSIS:

The temperature in the area during the study period ranged from 19.0°C to 42.0°C while the relative humidity varied between 28.0 % and 96.0%. The wind speed during the study period ranged from <1.8 to 20.4 Km/hr. The predominant wind direction is from NE. The meteorological data are presented in **Table No- 3.8**. The average wind rose is shown in **Figure No – 3.7**. Daily meteorological data during the study period is given in Annexure - 12

Table No – 3.8

METEOROLOGICAL DATA

PROJECT : MELAVENKATESWARAPURAM LIMESTONE MINE

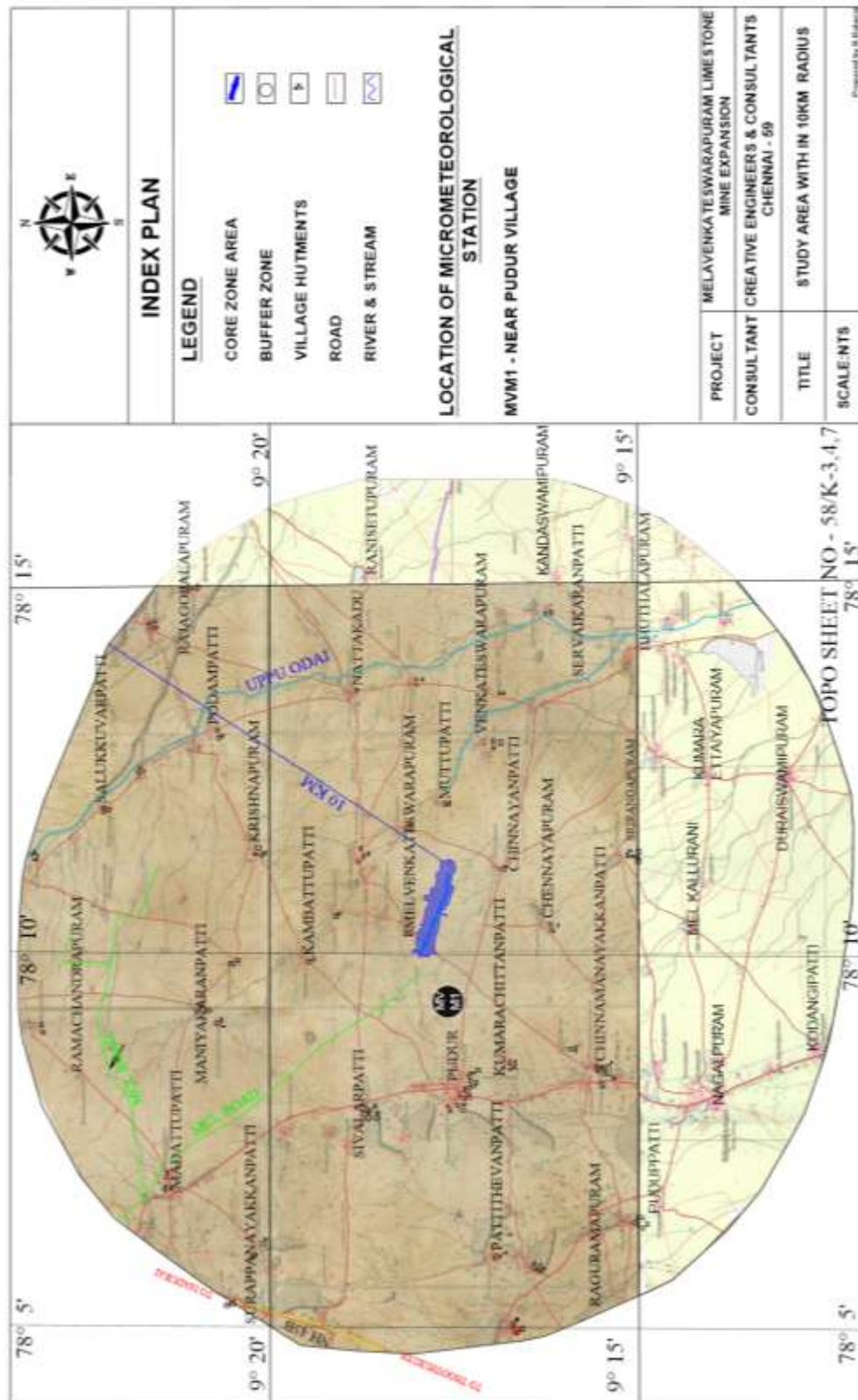
LOCATION : Near Puthur Village

SEASON : WINTER 2013-2014

PARAMETERS	MINIMUM	MAXIMUM
Temperature in °C	19.0	42.0
Humidity in %	28.0	96.0
Wind speed km/hr	<1.8	20.4
Predominant wind direction	NE	
Rainfall in mm	NIL	

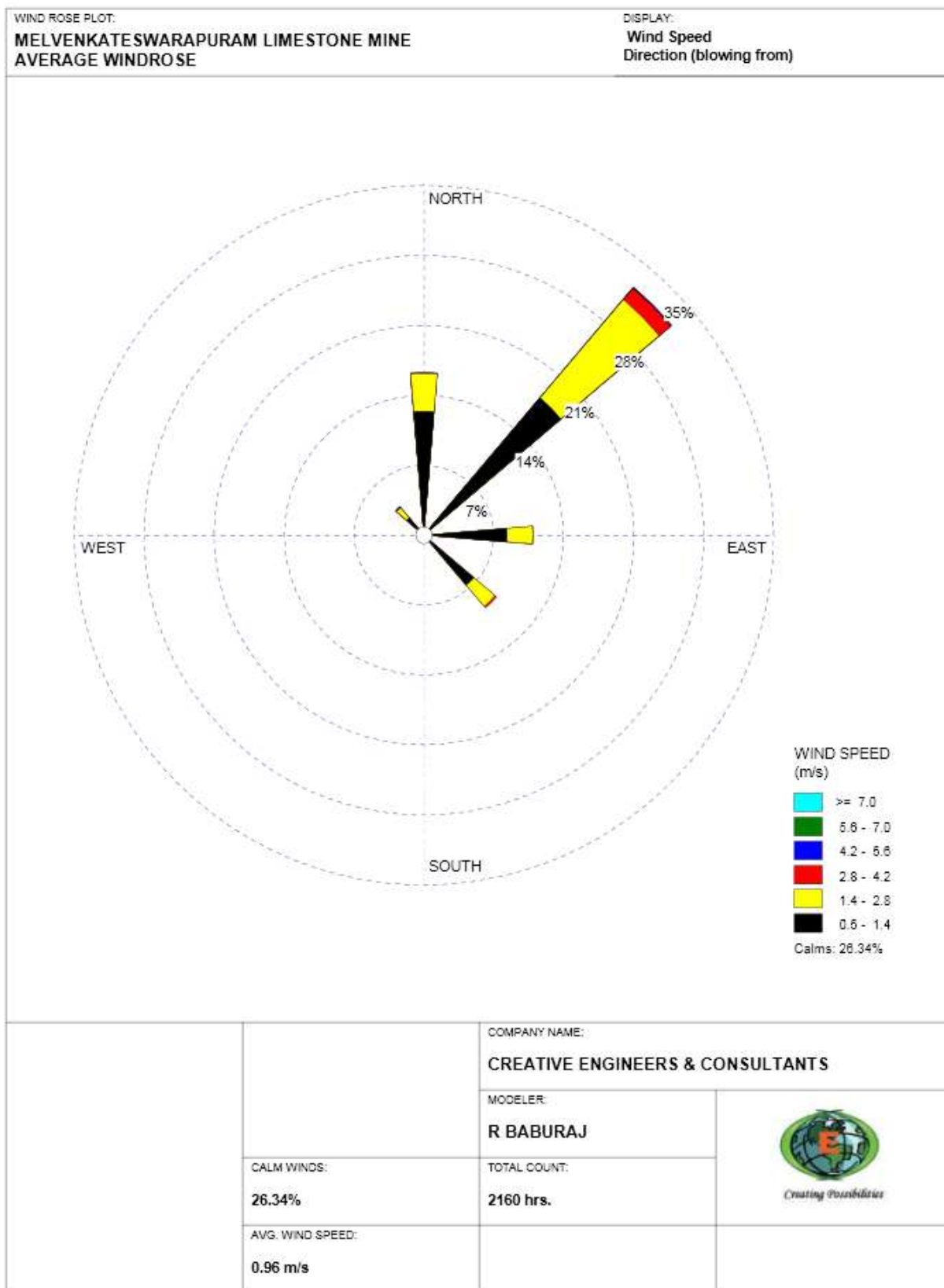
LOCATION OF MICRO-METEOROLOGICAL STATION

Figure No 3.6



AVERAGE WIND ROSE

Figure No- 3.7



WRPLOT View - Lakes Environmental Software

3.3.2 AIR ENVIRONMENT:

3.3.2.1 GENERAL:

The principal objective of the Ambient Air Quality Monitoring (AAQM) is to assess the existing levels of ambient air quality in and around the project area.

The ambient air quality (AAQ) depends upon emission scenario, meteorological conditions and background concentration of specific pollutants. With the above objective, the following parameters were analyzed at the sampling locations established in the study area.

- ❖ Particulate Matter (PM₁₀)
- ❖ Particulate Matter (PM_{2.5})
- ❖ Sulphur Dioxide
- ❖ Nitrogen Dioxide
- ❖ Carbon Monoxide
- ❖ Silica

Besides, the silica content in the core zone and buffer zone was also evaluated.

3.3.2.2 DESIGN CRITERIA FOR AMBIENT AIR QUALITY MONITORING STUDY NETWORK:

The monitoring stations are selected in such a way that they represent the mine and its related operations, other mines and industrial activities nearby, traffic pollution in the National Highway 45B and nearby Roads, etc. Other factors like topography/terrain, prevailing meteorological conditions like predominant wind direction, etc, play a vital role in selection of air sampling stations. Based on these criteria, 6 air sampling stations were selected in the area as shown below:

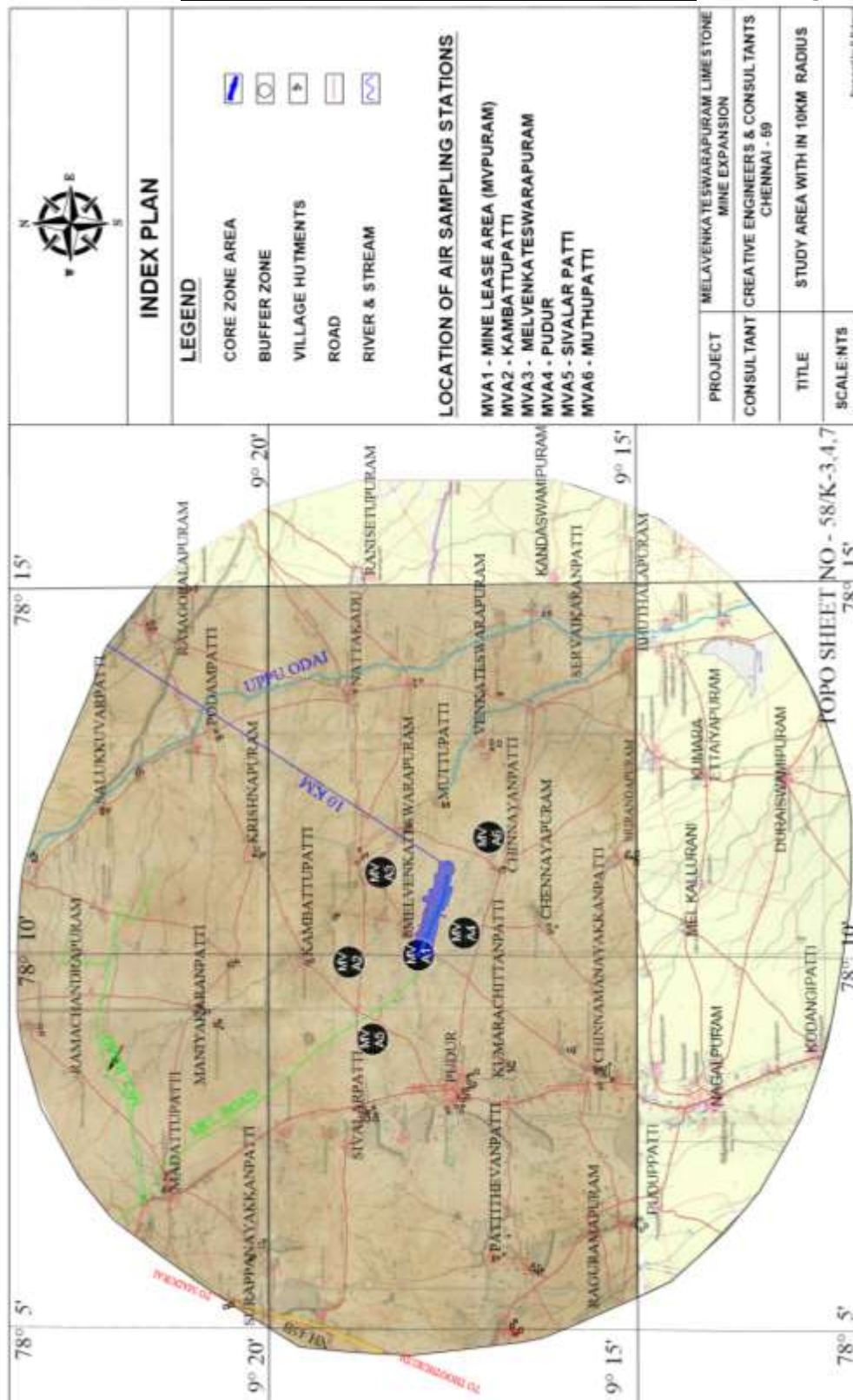
S. NO	CODE	LOCATION	DISTANCE FROM CORE ZONE in KMs	DIRECTION
1	MVA1	MINE LEASE AREA MV PURAM	-	-
2	MVA2	KAMBATTU PATTI	1.5	N
3	MVA3	MELVENKATESWARAPURAM	1.7	NE
4	MVA4	PUDUR	<1.0	SW
5	MVA5	SIVALARPATTI	2.1	NW
6	MVA6	MUTHUPATTI	1.0	SE

The location map, as above, for Ambient Air Quality study stations are shown in

Figure No- 3.8.

AMBIENT AIR QUALITY STUDY STATIONS

Figure No- 3.8



3.3.2.3 SAMPLING AND ANALYTICAL METHODOLOGIES:

Standard monitoring, and analytical procedures, as prescribed by CPCB, MOEF&CC and Bureau of Indian Standards was adopted for sampling systems as well as for analytical procedures for determining various air quality parameters. The methodology adopted is briefly described here under:

Respirable Particulate Matter (PM ₁₀)	- Gravimetric (IS 5182: Part 23:2006)
Particulate Matter PM _{2.5}	- Gravimetric (Fine particulate matter)
Sulphur Dioxide	- Calorimetric (West & Gaeke Method) (IS 5182: Part 02: 2001)
Nitrogen Dioxide	- Calorimetric (Modified Jacob & Hocheiser Method) (IS 5182: Part 06:2006).
Carbon Monoxide	- CO Monitor
Silica	-Calorimetric (Molybdate Method)

3.3.2.4 DATA ANALYSIS:

The AAQ monitored data for all locations for above parameters are shown in **Table No-3.9** and in **Figure No- 3.9**. Ambient Air Quality data during the study period is given in **Annexure – 13**.

From the table it is seen that, during winter 2013-2014 season, the SO₂ levels in all the six studied locations ranged from <3.0 µg/m³ to 6.2 µg/m³. The NO₂ concentrations varied from 6.4 µg/m³ to 13.4 µg/m³. The PM₁₀ levels varied from 45.4 µg/m³ to 86.6 µg /m³, PM_{2.5} levels varied from 18.3 µg /m³ to 34.7 µg /m³. The CO values in the all locations were found to be below detectable limit. Silica values in the study area are found to be below detectable limit. (Detection limit – 0.05mg/m³) which is well within the prescribed limit of 5mg/m³.

The existing Ambient Air Quality levels for SO₂, NO₂, PM₁₀ and PM_{2.5} are within the prescribed CPCB limits for “Industrial, Residential, Rural & other areas”.



AMBIENT AIR QUALITY DATA

Table No - 3.9

PROJECT: MELAVENKATESWARAPURAM LIMESTONE MINE OF TRCL

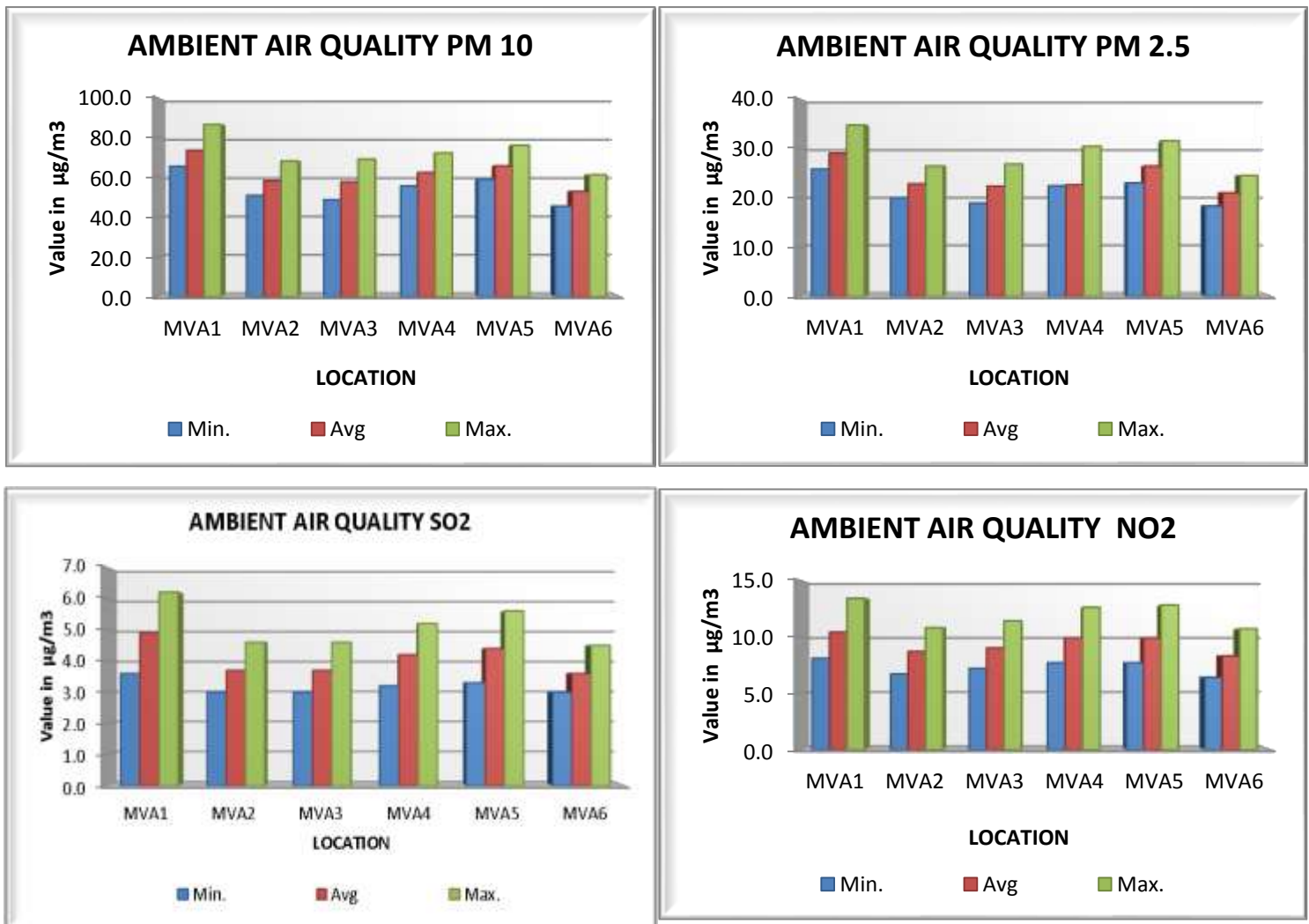
SEASON: WINTER - 2013-2014

VALUES IN $\mu\text{g}/\text{m}^3$

SL: NO	PARAMETERS	Cat.* (R, I, S)	PM ₁₀			PM _{2.5}			SO ₂			NO ₂		
	LOCATIONS		Min.	Avg	Max	Min.	Avg	Max	Min.	Avg	Max	Min.	Avg	Max
1	MINE LEASE AREA MV PURAM	R	65.6	73.6	86.6	25.8	29.0	34.7	3.6	4.9	6.2	8.1	10.4	13.4
2	KAMBATTU PATTI	R	50.9	58.4	68.2	20.0	22.8	26.4	BDL (D.L-3.0)	3.7	4.6	6.7	8.7	10.8
3	MELVENKATESW ARAPURAM	R	48.7	57.8	69.2	18.9	22.3	26.8	BDL (D.L-3.0)	3.7	4.6	7.2	9.0	11.4
4	PUDUR	R	55.7	62.4	72.3	22.4	26.2	30.4	3.2	4.2	5.2	7.7	9.9	12.6
5	SIVALARPATTI	R	59.0	65.8	76.2	23.0	26.4	31.5	3.3	4.4	5.6	7.7	9.9	12.8
6	MUTHUPATTI	R	45.4	52.9	61.3	18.3	21.0	24.5	BDL (D.L-3.0)	3.6	4.5	6.4	8.3	10.7
CPCB LIMITS			PM ₁₀			PM _{2.5}			SO ₂			NO ₂		
2009 Notification		I & R	100			60			80			80		
		S	100			60			80			80		

* Note: Category - R - Residential, I - Industrial, S – Sensitive
BDL- Below Detectable Limit, DL- Detectable Limit.

Figure No - 3.9



3.4. WATER ENVIRONMENT:

3.4.1 GENERAL:

Assessment of baseline data on water environment includes:

- Identification water resources
- Collection of water samples
- Analyzing water samples collected for physical -chemical parameters as per standards.

3.4.2 LOCATION OF SAMPLING STATIONS:

Ground water samples from 4 locations and one mine pit water were collected and analyzed for physical-chemical parameters. The locations are shown below

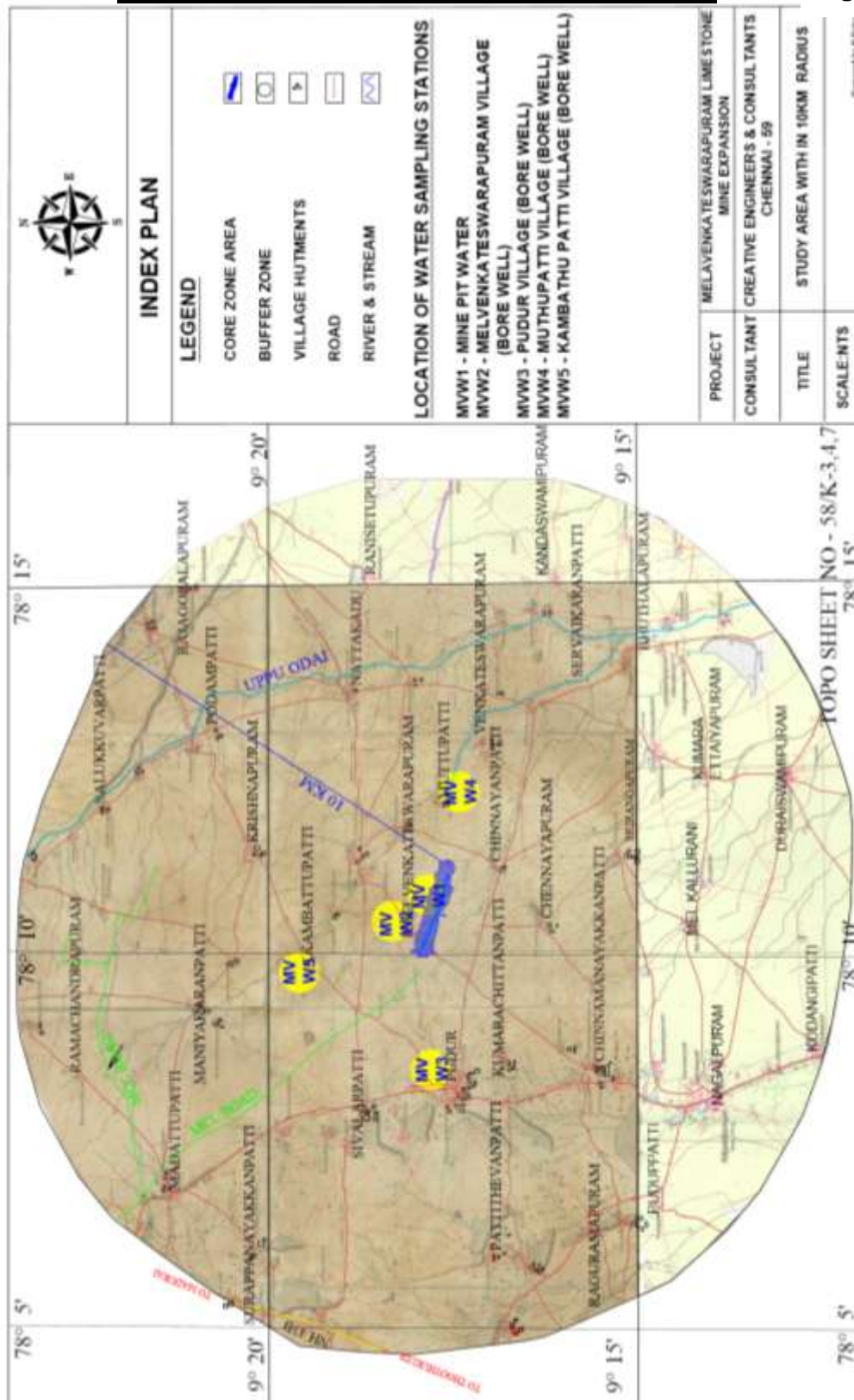
Location of Water Sampling Stations

S. No	Code	Location
1	MVW1	Mel Venkateshwara Puram Mine (Pit Water)
2	MVW2	Mel Venkateshwara Puram Village (Bore Well)
3	MVW3	Pudur Village (Bore Well)
4	MVW4	Muthupatti Village (Bore Well)
5	MVW5	Kambathupatti Village (Bore Well)

The map showing above locations is given in **Figure No- 3.10**.

LOCATION OF WATER SAMPLING STATIONS

Figure No - 3.10



3.4.3 SAMPLING METHODOLOGY:

Water samples were collected in 2 litre fresh cans as per IS 3025 Part - I and transported to the laboratory in Ice boxes.

3.4.4 DATA ANALYSIS AND INTER PRETATION:

The results of the ground water and mine pit water quality analysis are shown in **Table No-3.10** respectively.

Water quality studies have been conducted in 5 locations comprising 4 Ground water and one Mine pit water. In case of the 4 ground water samples, the pH values were ranging in between 7.38- 8.14, Turbidity values were found to be less than 1 NTU, TDS values ranged between 263 - 1542 mg/l, Chloride values were found to be 55.1 – 546.3 mg/L, Total hardness values were found to be 87.4 – 285 mg/l, total alkalinity values were found to be 141.4 – 420.2 mg/l, sulphate values were found to be 41.7 – 384.1 mg/l, iron values were found to be BDL to 0.25 mg/l, Nitrate values were found to be 0.74 to 14.3 mg/l and Fluoride values found to be 0.8– 1.1 mg/L respectively. The water quality of ground water samples were found to be within the prescribed IS: 10500 Norms for Drinking in the absence of an alternative source.

In case of the mine pit water, the pH value is found to be 8.19. TDS and Chloride values were found to be 1930 mg/l and 479.8 mg/l respectively. Total hardness value found to be 712.5 mg/l, total alkalinity value found to be 260 mg/l, sulphate values were found to be 791.7 mg/l , Iron value found to be 0.01 mg/L , Nitrate value found to be 7.7 mg/L, Manganese value found to be less than 0.05 mg/L , Fluoride value found to be 1.27 mg/l, Total Suspended Solids Value found to be 2.0 mg/L, COD value found to be 96 mg/L, BOD value is found to be less than 27 mg/l. The pit water quality is found to be within the prescribed TNPCB Norms.

WATER QUALITY DATA

Table No - 3.10

S. No.	Parameter	W1	TNPCB Norms	W2	W3	W4	W5	IS:10500 Permissible Limits
1	Odour	Agreeable		Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
2	Turbidity, NTU	<1	-	<1	<1	<1	<1	5
3	pH	8.19	5.5-9.0	7.43	7.38	8.14	7.67	6.5 - 8.5
4	Electrical Conductivity, umhos/cm	3016	-	462.5	2482	2526	1134	-
5	Total Dissolved Solids, mg/l	1930	2100	263	1490	1542	670	2000
6	Total Hardness (as CaCO ₃), mg/l	712.5	-	115.9	285.0	180.5	87.4	600
7	Calcium as Ca, mg/l	193.8		35.7	57	34.2	31.9	200
8	Magnesium as Mg,mg/L	54.7		6.3	34.2	22.8	1.8	100
9	Calcium as CaCO ₃ , mg/l	484.5	-	89.3	142.5	85.5	79.8	-
10	Magnesium as CaCO ₃ ,mg/l	228.0	-	26.6	142.5	95	7.6	-
11	Total Alkalinity (as CaCO ₃), mg/l	260	-	141.4	403.5	420.2	328.6	600
12	Chloride (as Cl), mg/l	479.8	1000	55.1	546.3	541.5	247	1000
13	Free residual chlorine as Cl	BDL (D.L - 0.2)	1.0	BDL (D.L - 0.2)	BDL (D.L - 0.2)	BDL (D.L - 0.2)	BDL (D.L - 0.2)	1.0
14	Sulphates as SO ₄ ²⁻	791.7	1000	41.7	108.2	384.1	57.7	400
15	Iron (as Fe), mg/l	BDL (D.L.0.01)	-	0.25	0.17	BDL (D.L.0.01)	0.06	0.3
16	Nitrate as NO ₃	7.7	-	0.74	14.2	14.3	2.7	45
17	Fluoride as F	1.27	2.0	0.91	1.1	1.0	0.8	1.5
18	Manganese as Mn	BDL (D.L -0.05)	-	BDL (D.L - 0.05)	BDL (D.L - 0.05)	BDL (D.L - 0.05)	BDL (D.L - 0.05)	0.3
19	BOD-3 days @ 27 oC, Mg/l	27	30	-	-	-	-	-
20	COD, mg/l	96	250	-	-	-	-	-
21	Total Suspended Solids, mg/L	BDL (D.L - 2.0)	100	-	-	-	-	-

3.5 NOISE ENVIRONMENT:

3.5.1 GENERAL:

Sound can be defined as atmospheric or air vibration perceptible to ear. Noise is usually unwanted or undesired sound. Consequently, particular sound can be noise to one person and not to others or noise at one time and not at other time. Hence sound loud enough to be harmful is called noise without regard to its characteristics. Noise is a form of pollution because it can cause hearing impairment and psychological stresses.

3.5.2 MONITORING LOCATIONS & METHODOLOGY:

Noise measurements were carried out for a day once in a Season at about 6 locations.

The locations are indicated below

Location of Noise Monitoring Stations

S. No	Code	Location	Direction	Distance in km
Ambient noise level				
1	MVN1	MEL VENKATESWARAPURAM MINE LEASE AREA	-	-
2	MVN2	KAMBATTUPATTI VILLAGE	1.5	N
3	MVN3	MEL VENKATESWARAPURAM VILLAGE	1.7	NE
4	MVN4	PUDUR VILLAGE	<1.0	SW
5	MVN5	SIVALAR PATTI VILLAGE	2.1	NW
6	MVN6	MUTHUPATTI VILLAGE	1.0	SE

These Locations are shown in **Figure No-3.11.**

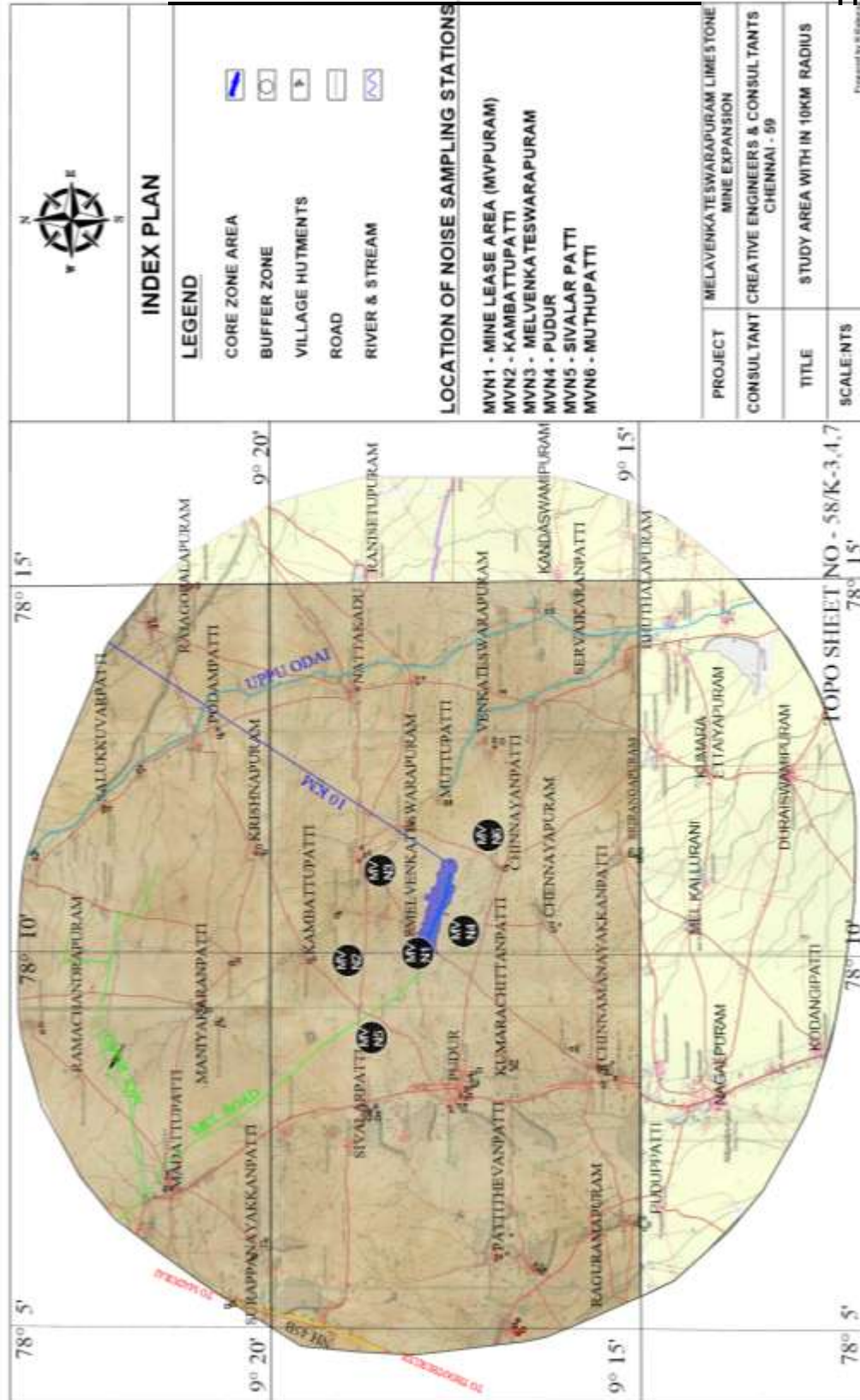
3.5.3 DATA ANALYSIS AND INTERPRETATION:

The results of hourly background noise levels for all 6 locations are given in **Table No-3.11**. The noise values for all above locations are shown in a comparative chart given in **Figure No- 3.12**.

From the table it is found that, the day, night equivalent of existing noise level in the core zone area (MVN1) are 56.0 dB(A), 42.8 dB(A) respectively which are below the work zone exposure limit of 90 dB(A). In the buffer zone, day Equivalent Noise (Leq-d) noise levels were ranging from 45.2 dB(A) to 49.9 dB(A) and night Equivalent Noise (Leq-d) levels ranged between 38.2 dB(A) to 39.0 dB(A). While comparing with the MOEF&CC Norm of 55 dB(A) for day time and 45 dB(A) for night time, the monitored ambient noise levels were within the limit values for Residential areas.

LOCATION OF NOISE SAMPLING STATIONS

Figure No-3.11

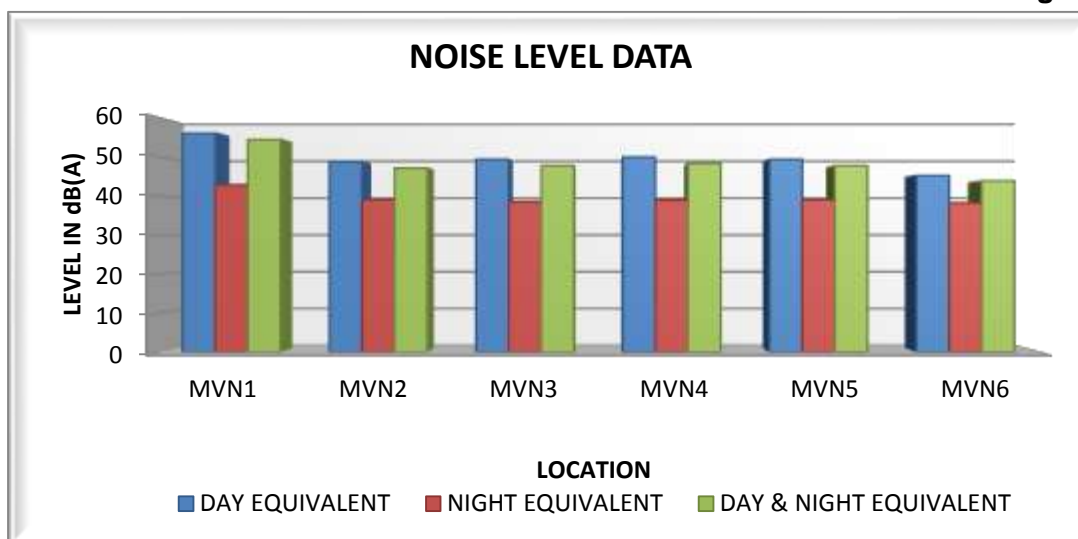


AMBIENT NOISE LEVELS- (in dB(A))

Table No-3.11

Time in hrs	MVN1	MVN2	MVN3	MVN4	MVN5	MVN6
6	45.2	39.1	38.8	42.2	40.8	39.6
7	44.7	43.8	39.1	48.5	46.7	46.7
8	47.8	47.6	45.5	50.2	51.1	45.5
9	52.9	48.8	50.6	50.8	48.9	47.4
10	56.6	50.1	48.8	51.2	49.2	49.8
11	57.1	47.7	47.6	52.2	50.6	48.1
12	59.8	48.9	46.5	50.5	51.3	47.6
13	59.6	51.2	50.7	49.9	52.7	45.2
14	58.6	50.6	51.1	46.1	49.6	44.3
15	54.5	51.1	52.8	47.4	50.5	42.2
16	59.1	50.8	54.4	48.8	47.7	44.8
17	58.8	48.6	51.1	50.6	48.2	41.9
18	57.2	49.1	48.6	52.1	49.1	40.7
19	48.8	46.7	47.7	50.7	50.4	41.1
20	47.9	46.5	44.4	49.4	43.7	39.8
21	45.8	45.5	40.2	48.8	45.5	37.5
22	47.2	42.1	40.1	40.5	40.8	40.6
23	45.5	40.7	38.2	37.5	39.9	36.8
24	41.1	38.1	36.5	37.9	38.1	37.4
1	40.7	37.6	38.1	38.8	37.6	36.5
2	39.1	36.9	37.9	37.9	38.4	37.3
3	38.8	36.8	37.2	37.5	39.5	36.8
4	40.2	37.9	38.8	39.4	37.6	38.4
5	41.6	38.8	40.1	40.2	39.3	39.9
DAY EQUIVALENT	56.0	48.7	49.3	49.9	49.3	45.2
NIGHT EQUIVALENT	42.8	39	38.5	38.9	39	38.2
DAY & NIGHT EQUIVALENT	54.4	47.1	47.7	48.3	47.7	43.8

Figure No- 3.12



3.6 SOIL CHARACTERISTICS:

3.6.1 GENERAL:

Soil is defined as the naturally deposited, unconsolidated material which covers the earth's surface, whose chemical, physical properties are capable of plant growth. Soil itself is very complex. Soil contains mineral particles, air, water and organic matter.

Soil pH supports a number of inorganic and organic chemical reactions. Soil fertility is directly influenced by pH through the solubility of many nutrients. Maximum soil fertility occurs in the range 6.0 – 7.2

Soil texture has an important role in nutrient management and the size distribution of the mineral particles (sand, silt, clay). Depending on the size of the particles in the soil, it can be classified in to sandy, silty, clay, loamy, peaty and chalky soils.

For sustained growth plants absorbing nutrients (macro nutrients, micro nutrients) from soil. Macro nutrients include nitrogen, phosphorus, potassium, calcium, magnesium and sulphur. Micro nutrients are trace metals. The soil nitrogen which is responsible for strong stem and foliage growth, phosphorus which aids in healthy root growth and flower and seed production and potassium, which is responsible for improving overall health and disease resistance of a plant. Among all soil cations sodium is not essential for plant elements but effects soil pH.

Soil sampling locations are shown in **Figure No 3.13**.

The four locations are:

MVS1 - Mine Lease Area

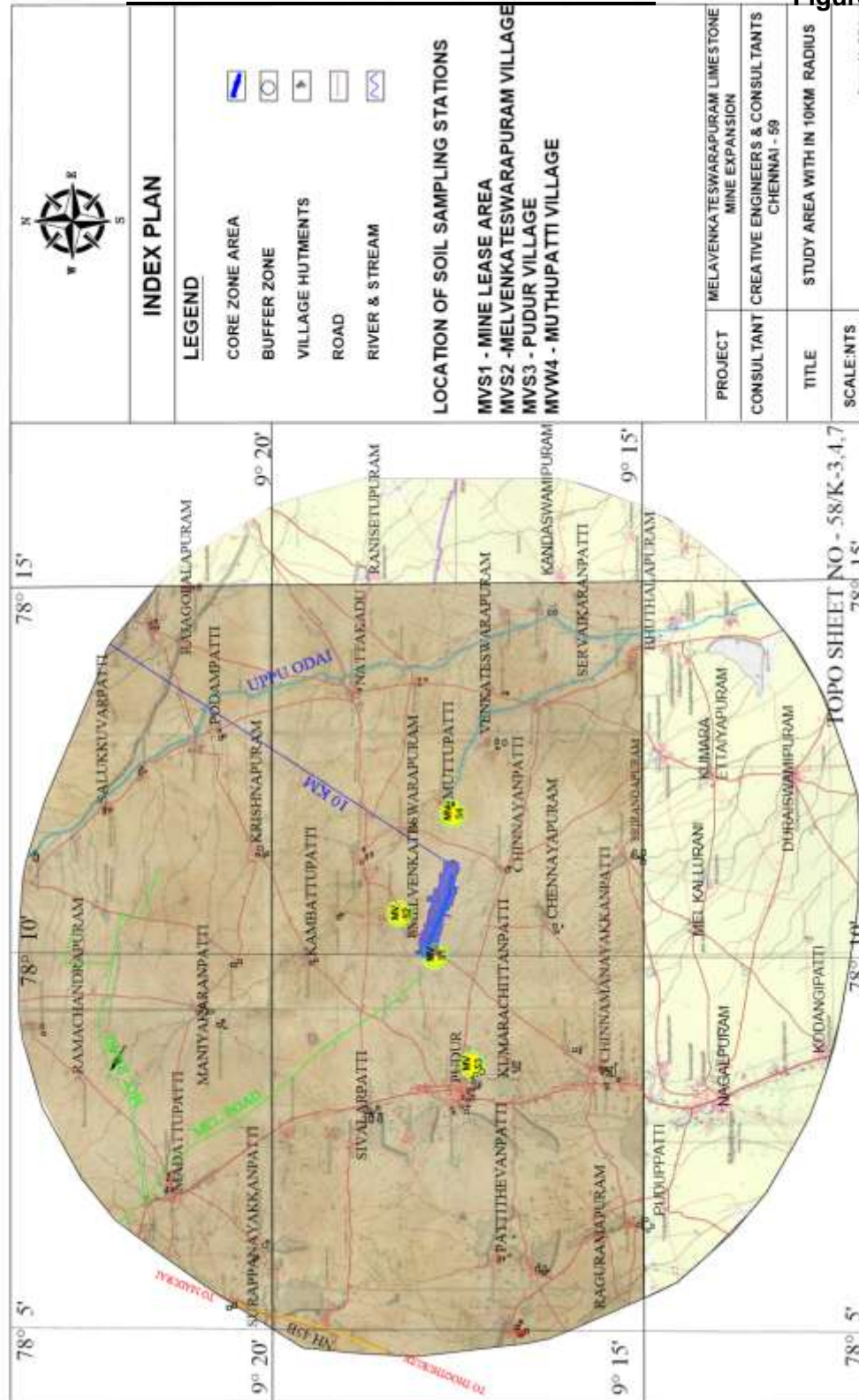
MVS2 - Melavekateshwarapuram Village

MVS3 - Pudur Village

MVS4 - Muthupatti Village

LOCATION OF SOIL SAMPLING STATIONS

Figure No – 3.13



3.6.2 DATA ANALYSIS:

Results of the soil samples show that the pH values were ranging between 8.59 –8.84 and Electrical Conductivity values were ranging between 65.52 - 152 μ s/cm. Soils are generally Silt loam type.

Organic matter content were ranging between 1.06 – 9.29 %. Total Nitrogen values were less than BDL(D.L-2.0) – 344.7 mg/kg. Phosphorus values were ranging between 0.2 – 1.8 μ g/g. Potassium values were ranging between 707.9– 4894.4 mg/kg. Sodium values were ranging between 606 to 1514.1mg/kg.

The soil quality data for the 4 samples collected and analyzed are provided in **Table no – 3.12.**

SOIL QUALITY DATA

Table No – 3.12

Sl. No.	Parameter	Location			
		MVS1	MVS2	MVS3	MVS4
1	pH at 25° C	8.76	8.84	8.6	8.59
2	Electrical Conductivity, μ mhos/cm	152	65.52	85.22	75.21
3	Dry Matter Content, %	95.89	97.69	85.84	94.51
4	Water Content	4.1	2.3	14.16	5.49
5	Organic Matter, %	1.06	4.46	9.29	6.87
6	Soil Texture,	CLAY	CLAY LOAM	SANDY CLAY	CLAY
7	Grain Size Distribution i. Sand, %	20.26	26.16	45.09	26.53
	Silt, %	25.02	35.66	17.42	27.85
	Clay, %	54.72	38.19	37.49	45.62
8	Phosphorous, μ g/g	0.2	1.8	1.4	1.66
9	Sodium, mg/kg	1514.1	827.1	606	1032.3
10	Potassium, mg/kg	707.9	4894.4	2354.5	2161.1
11	Total Nitrogen, mg/kg	BDL (D.L – 2.0)	220	332.2	344.7
12	Total Sulphur,%	BDL (D.L – 0.02)	BDL (D.L – 0.02)	BDL (D.L – 0.02)	BDL (D.L – 0.02)

3.7 BIOLOGICAL ENVIRONMENT:

The details of Biological Environment comprising Flora and Fauna have been collected through field visits and from various Government agencies. The study details are given below:

3.7.1 FLORA:

CORE ZONE:

The ML area is mostly barren rocky ground. Therefore, there exists no specific flora & fauna within the ML area. There are small shrubs and trees in the area. The flora in the area is generally common variety of trees like *Prosopis juliflora*, *Acacia nilotica*, *Albizia amara*, *Azadirachta indica* etc., shrubs namely *Morinda tinctoria*, *Calotropis gigantea*, *Jatropha sps.*, *Ziziphus jujube*, *Adhatoda vasica* etc., and herbs like *Achyranthes aspera*, *Sida acuta*, *Corchorus sps.*, *Tridax procumbens*, , *Tephrosia purpurea* etc., and grasses are *Cynodon dactylon*, *Commelina clavata*, *Juncus bufonius*, *Kyllinga Sp*, *Pycnus globosus*, *Pycnus unioides*, *Fimbristylis kingii*, *Fimbristylis uliginosa*, *Carex nubigena*, *Carex phacota*, *Carex filicina*, *Oplismenus undulatifolius*, *Arundinella fuscata*, *Setaria glauca*, *Andropogon foulkesii*, *Chrysopogon zeylanicus*, *Heteropogon contortus*, *Cymbopogon polyneuros*, *Tripogon bromoides*, *Eragrostis sps.*, etc.,

BUFFER ZONE:

The region has vast stretches of fallow land, mostly dry land. The lands with dry scattered bushes and wild growth support goat rearing in the area. There are no forest areas within the buffer zone.

Limitation exhibited by soil condition also imposes certain constraint in landuse and hence, dry crop is predominantly seen. But in some places, near tanks and stream courses, paddy cultivation is also observed. Seasonal crops such as Ragi, Sorghum and gram varieties such as black gram, horse gram etc are grown along with fodder grass. Sunflower is also grown in some parts.

Trees like *Azadirachta indica* (neem), *Prosopis Juliflora*, *Acacia Sp*, *Moringa oleifera*, *Albizia sp*, *Cocos nucifera*, etc. are commonly seen.

The dominant shrubs consists of *Adhatoda vasica*, *Cassia auriculata*, *Calotropis gigantea*, *Datura metel*, *Lantana camara*, *Lawsonia inermis*, *Nerium oleander*, *Hibiscus rosa-sinensis* *Zizyphus Sp* etc. The climbers consists of *Coccinia indica* , *Cissus quadrangularis* , *Abrus precatorius* and prominent herbs are *Acalypha indica*, *Sida cordifolia*.

A consolidated list of flora species in the study area are given in Table No – 3.13

Table No- 3.13

LIST OF FLORA SPECIES IN THE STUDY AREA

SI.NO	BOTANICAL NAME	TAMIL NAME	FAMILY NAME
Trees			
1	<i>Azadirachta indica</i>	Vembu	Meliaceae
2	<i>Peltophorum pterocarpum</i>	Kilukiluppai	Fabaceae
3	<i>Prosopis juliflora</i>		Fabaceae
4	<i>Tamarindus indica</i>	Puli	Fabaceae
5	<i>Tectona grandis</i>	Tekku	Lamiaceae
6	<i>Pongamia pinnata</i>	Pungai	Fabaceae
7	<i>Pongamia glabra</i>	Kattu pungai	Fabaceae
8	<i>Moringa oleifera</i>	Murungai	Moringaceae
9	<i>Eucalyptus lanciolatus</i>	Thailamaram	Myrtaceae
10	<i>Phoenix sylvestris</i>	Eeachamaram	Arecaceae
11	<i>Albizia amara</i>	Vagai	Fabaceae
12	<i>Acacia nilotica</i>	Karuvelan	Fabaceae
13	<i>Polyalthia longifolia</i>	Nietilingam	Annonaceae
14	<i>Psidium guajava</i>	Koyya	Myrtaceae
15	<i>Cocos nucifera</i>	Tennai	Arecaceae
16	<i>Ficus benghalensis</i>	Aalamaram	Moraceae
17	<i>Ficus religiosa</i>	Poarasamaram	Moraceae
18	<i>Ficus hispida</i>	Aarasu	Moraceae
19	<i>Pithecellobium dulce</i>	Kodukkapuli	Fabaceae
20	<i>Delonix regia</i>	Gulmohar	Fabaceae
21	<i>Casuarina equisetifolia</i>	Savukku	Causuarinaceae
22	<i>Mangifera indica</i>	Maamaram	Amacardiaceae
23	<i>Artocarpus heterophyllus</i>	Palamaram	Moraceae

24	<i>Murraya koenigii</i>	Curry leaf	Rutaceae
25	<i>Citrus medica</i>	Lemon	Rutaceae
26	<i>Plumeria acuminata</i>	Alari	Apocyanaceae
27	<i>Carica papaya</i>	Pappali	Caricaceae
28	<i>Odina wodier</i>	Oodiyam	Anacardiaceae
29	<i>Tecoma strans</i>	Yellow trumpetbush	Bignoniaceae
30	<i>Samanea saman</i>	Rain tree	Fabaceae
31	<i>Pheonix Sp</i>	Panai	Arecaceae
32	<i>Bougainvillea sps</i>		Nyctaginaceae
33	<i>Sterculia foetida</i>		Malvaceae
34	<i>Caesalpinia pulcherrima</i>	Mayilkondrai	Fabaceae
35	<i>Pterospermum acerifolium</i>	Poovarasoo	Malvaceae
36	<i>Achras sapota</i>	Sappota	Sapotaceae
37	<i>Phyllanthus emblica</i>	Nelli	Phyllanthaceae
38	<i>Anacardium occidentale</i>	Munthiri	Anacardiaceae
39	<i>Annona squamosa</i>	Siththa	Annonaceae
40	<i>Musa x paradisiaca</i>	Valzhilai	Musaceae
41	<i>Syzygium cumini</i>	Naval	Myrtaceae
Shrubs			
1	<i>Sida cordifolia</i>	Sida plant	Malvaceae
2	<i>Sida acuata</i>		Malvaceae
3	<i>Ziziphus jujuba</i>	Elanthai	Rhamnaceae
4	<i>Cassia auriculata</i>	Aavarampoo	Fabaceae
5	<i>Datura metel</i>	Oomaththai	Solanaceae
6	<i>Calotropis gigantea</i>	Earukku	Apocynaceae
7	<i>Caesalpinia bonducella</i>		Caesalpinaceae
8	<i>Jatropha glandulifera</i>	Oil plant	Euphorbiaceae
9	<i>Adhatoda vasica</i>	Adathoda	Acanthaceae

10	Hibiscus rosa-sinensis	Semparuthi	Malvaceae
11	Nerium oleander	Arali	Apocynaceae
12	<i>Lantana camara</i>	Putus	Verbinaceae
13	<i>Ixora casei</i>	Idlipoo	Rubiaceae
14	<i>Lagerstroemia indica</i>	Crape myrtle	Lythraceae
15	Lawsonia inermis	Maruthani	Lythraceae
16	Jasminum grandiflorum	Malligai	Oleaceae
17	Parthenium hysterophorus	Parthenium	Asteraceae
18	Rosa indica	Rose	Rosaceae
19	Solanum xanthocarpum	Kandangkattari	Solanaceae
Cactus			
1	<i>Opuntia dillenii</i>	Sappathikalli	Cactaceae
2	<i>Agave americana</i>	Kaththalzhi	Asparagaceae
3	Cereus peruvianus	Kalli	Cactaceae
4	<i>Cereus trifolia</i>	Thirukkalli	Cactaceae
Herbs			
1	Acalypha indica	Kupaimeni keeri	Euphorbiaceae
2	Acanthospermum hispidum	Gokul kanta	Asteraceae
3	Achyranthes aspera	Nayuruvi	Amaranthaceae
4	Andrographis echinoides	Birkubat	Acanthaceae
5	Andrographis paniculata	Kirayt	Acanthaceae
6	Amaranthus viridis	Green amaranth	Amaranthaceae
7	Argemone mexicana	Mexican poppy	Papaveraceae
8	Atylosia scarabaeoides	Venkulthi	Fabaceae
9	Boerhavia erecta	Erect spiderling	Nyctaginaceae
10	Cleome viscosa	Naai velai	Cleomaceae
11	Coleus amboinicus	Indian borage	Lamiaceae
12	Cosmos caudata	Ulam raja	Compositae

13	Croton sparsiflorus	Poodu sedi	Euphorbiaceae
14	Cuphea hyssopifolia	Elfin herb	Lythraceae
15	Digera muricata	False amaranth	Amaranthaceae
16	Gynandropsis pentaphylla	Nalla velai	Cleomaceae
17	Kalanchoe blossfeldiana	Kalanchoes	Crassulaceae
18	Leucas aspera	Thumbai	Lamiaceae
19	Mimosa pudica	Touch me not	Fabaceae
20	Phyllanthus niruri	Keelzhaneeli	Phyllanthaceae
21	Polycarpaea corymbosa	Old man's cap	Carryophyllaceae
22	Solanum nigrum	Manatthakalli	Solanaceae
23	Sphaeranthus indicus	Indian globe thisle	Asteraceae
24	Tephrosia purpurea	Vayal poondu	Fabaceae
25	Tridax procumbens	Vettukai poondu	Asteraceae
26	Glandularia bipinnatifida	Purple praire	Verbanaceae
27	Vinca rosea	Nithiyakalyani	Apocynaceae
28	Wedelia calendulacea	Aster	Asteraceae
29	Xanthium strumarium	Rough cocklebur	Asteraceae
Climbers			
1	Abrus precatorius	Indian licorice	Fabaceae
2	Cardiospermum halicacabum	Ballon plant	Sapindaceae
3	Coccinia indica	Kovai	Cucubitaceae
4	Convolvulus sps	-	Covolvulaceae
5	Ipomia carnea	Pink morning glory	Convolvulaceae
6	<i>Luffa cylindrica</i>	Peirkkai	Cucurbitaceae
7	Cissus quadrangularis	Pirandai	Vitaceae
8	Asparagus racemosus	Shatawari plant	Asparagaceae
GRASSES:			
Sl.NO	Species Name	Family Name	
1	<i>Commelina clavata</i>	Commelinaceae	

2	<i>Aneilema lanuginosum</i>	Commelinaceae
3	<i>Cyanotis pilosa</i>	Commelinaceae
4	<i>Juncus glaucus</i>	Juncaceae.
5	<i>Juncus prismatocarpus</i>	Juncaceae.
6	<i>Juncus bufonius</i>	Juncaceae.
7	<i>Luzula campestris</i>	Juncaceae.
8	<i>Eriocaulon brownianum</i>	Eriocaulaceae
9	<i>Eriocaulon collinum</i>	Eriocaulaceae
10	<i>Kyllinga melanosperma</i>	Cyperaceae
11	<i>Kyllinga cylindrica</i>	Cyperaceae
12	<i>Pycnus globosus</i>	Cyperaceae
13	<i>Pycnus unioides</i>	Cyperaceae
14	<i>Mariscus cyperinus</i>	Cyperaceae
15	<i>Fimbristylis kingii</i>	Cyperaceae
16	<i>Fimbristylis uliginosa</i>	Cyperaceae
17	<i>Carex nubigena</i>	Cyperaceae
18	<i>Carex phacota</i>	Cyperaceae
19	<i>Carex filicina</i>	Cyperaceae
20	<i>Carex myosurus</i>	Cyperaceae
21	<i>Isachne australis</i>	Poaceae
22	<i>Panicum villosum</i>	Poaceae
23	<i>Oplismenus undulatifolius</i>	Poaceae
24	<i>Arundinella fuscata</i>	Poaceae
25	<i>Setaria glauca</i>	Poaceae
26	<i>Cyanodon dactylon</i>	Poaceae
27	<i>Pollinia quadrinervis</i>	Poaceae
28	<i>Andropogon Sp</i>	Poaceae
29	<i>Chrysopogon zeylanicus</i>	Poaceae

30	Heteropogon contortus	Poaceae
31	<i>Cymbopogon polyneuros</i>	Poaceae
32	<i>Cymbopogon sp</i>	Poaceae
33	<i>Calamagrostis pilosula</i>	Poaceae
34	<i>Zenkeria elegans</i>	Poaceae
35	<i>Tripogon bromoides</i>	Poaceae
36	<i>Eragrostis amabilis</i>	Poaceae
37	<i>Eragrostis sp</i>	Poaceae
38	Festuca bromoides	Poaceae

CULTIVATED CROPS:

Sl.No	Species Name	Local Name	Family Name
1	<i>Vigna mungo</i>	Vulunthu	Fabaceae
2	<i>Sorghum vulgare</i>	Solam	Poaceae
3	<i>Musa x paradisiaca</i>	Valzhai	Musaceae
4	<i>Cocos nucifera</i>	Tennai	Arecaceae
5	<i>Gossypium hirsutum</i>	Paruththi	Malvaceae
6	<i>Ricinus communis</i>	Aamanakku	Euphorbiaceae
7	<i>Helianthus annuus</i>	Sun flower	Asteraceae
8	<i>Pisum sativum</i>	Avarai	Fabaceae
9	<i>Cyamopsis tetragonoloba</i>	Koththavarai	Fabaceae
10	<i>Pennisetum glaucum</i>	Kampuo	Poaceae
11	<i>Solanum melongena</i>	Kaththarii	Solanaceae
12	<i>Capsicum annum</i>	Red chilli	Solanaceae

PLANTATION/ VEGETATION SEEN AROUND THE LEASE AREA

Photo 3.1



3.7.2 FAUNA:

There is no Wild Life Sanctuary or National Park or Biosphere within the study area of 10 km. The fauna species found in the buffer zone are Hare, Three striped palm squirrel. The avifauna found is Peafowl, Partridge, Parrot, Cuckoo, Owl, King fisher, Dove, Egret, Parakeets, Myna, etc. Other than Peafowl there are no schedule – I items in the study area. However, least disturbance and impact on its existence is ensured, as the mining operations are conducted at deeper level and the blasting noise, etc., will be at minimal quantum. Besides, all environmental protection measures for mining impacts are properly implemented. There will be only insignificant impact on the movement factors of Peafowl species.

The mining personal and others in the area are also properly cautioned to cause least disturbance to this species and its existence and movements.

A consolidated list of fauna species in the study area are given in **Table No – 3.14**.

LIST OF FAUNA SPECIES IN THE STUDY AREA

Table No- 3.14

MAMMALS		Schedule
Palm civet	<i>Paradoxurus hermaphroditus</i>	SCH – II
Hare	<i>Lepus nigricollis</i>	SCH – IV
Three striped palm squirrel	<i>Funambulus palmarum</i>	SCH - IV
BIRDS		
Dove	<i>Chalcophaps indica</i>	SCH – IV
Cuckoo	<i>Cuculus micropterus</i>	SCH – IV
Egret	<i>Egretta garzetta</i>	SCH – IV
Common Myna	<i>Acridotheres tristis</i>	SCH – IV
King fisher	<i>Alcedo atthis</i>	SCH – IV
Owl	<i>Tyto alba</i>	SCH – IV
Parakeets	<i>Psittacula krameri</i>	SCH – IV
Partridge	<i>Francolinus pondicerianus</i>	SCH – IV
Quail	<i>Perdica asiatica</i>	SCH – IV
Peafowl	<i>Pavo cristatus</i>	SCH – I
REPTILES		
Cobra	<i>Naja naja</i>	SCH – II
Ground lizard	<i>Mabuya carinata</i>	
Krait	<i>Bungarus caeruleus</i>	SCH – IV
Lizard	<i>Calotes versicolor</i>	

* - Schedule not specified in Wild Life Protection Act - 1972

3.8 LANDUSE PATTERN OF MELAVENKATESWARAPURAM LIMESTONE MINES USING REMOTE SENSING SATELLITE DATA

3.8.1. Introduction:

It is known that landuse of an area is controlled by the environment setting of an area. It is constrained by the inherent characteristics of a terrain such as lithology, landform, soil, slope and drainage. Any disturbance beyond a sustainable level affects the local environment which in turn exerts influence on the existing landuse pattern. The changes in the pattern of existing resources are always changing, which either may be due to natural or human activities. The applicability of landuse information is very wide and there may be many inferences vital for various developmental activities that could be obtained from the study of landuse pattern and its periodical changes over time. The pattern emerging from the landuse study throws light on the demographic, socio-economic and prevailing condition of natural resources in an area. Also, landuse data is requisite for water resources inventory, flood control and is used for environmental impact assessment of an area. An increase or decrease of specific landuse category or change in the use of land parcels always indicates both economic as well environmental condition of an area. Collecting such dynamic information in a standardized format is an arduous task.

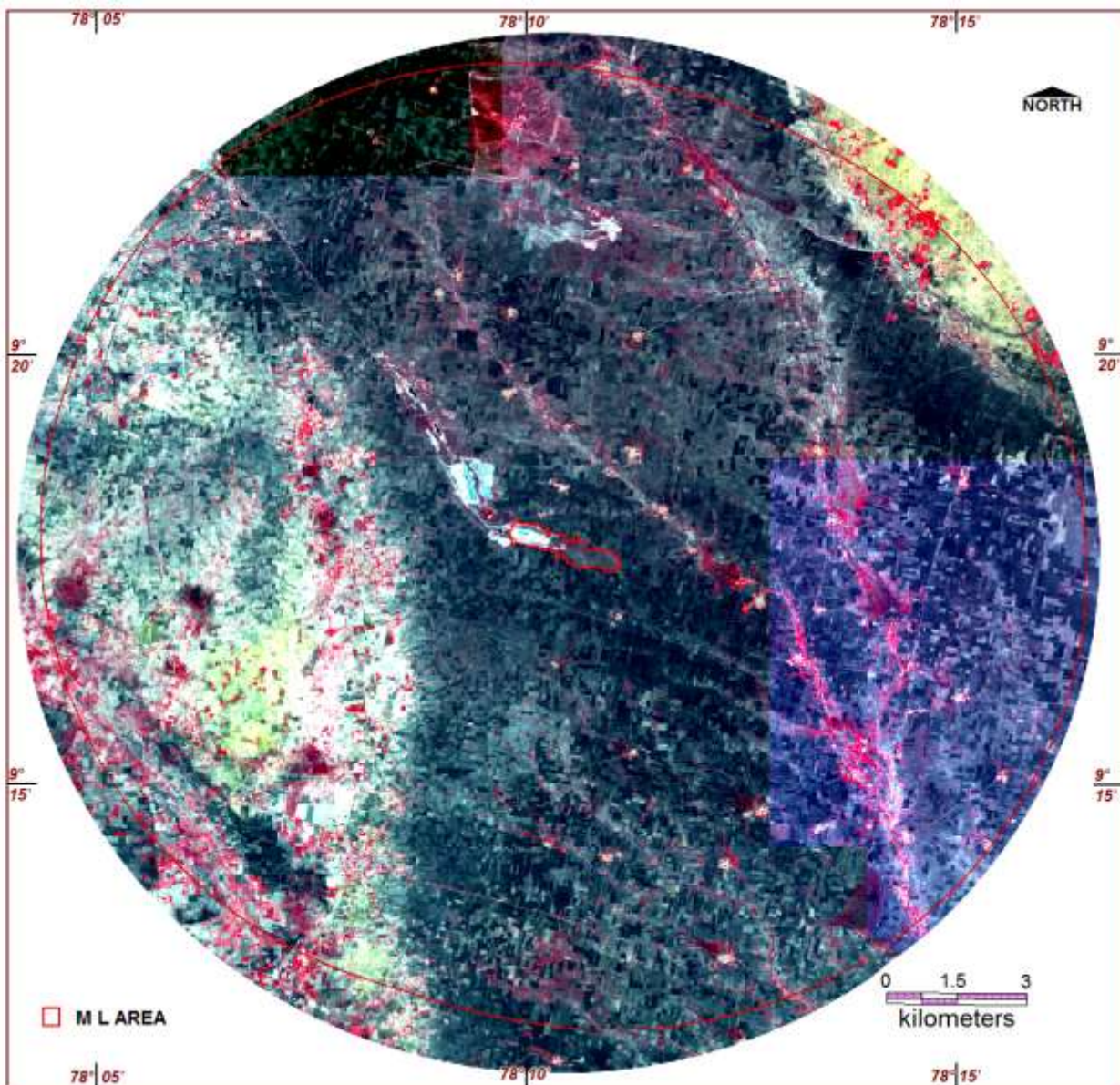
Remote sensing satellite data would assist in obtaining such valuable and formidable information with respect to landuse environment of an area. The synoptic view under uniform illumination and its repetitive coverage allows employing RSI (remote sensing satellite image) to generate landuse information of an area at a periodical interval. Change of both macro and micro-level (soil and water condition) reflected by landuse induced by developmental activities could be mapped and relevant mitigation measures could be implemented.

3.8.2 Remote sensing satellite data used for the study

In the present study, remote sensing satellite data LISS IV of Resourcesat2 acquired on 30th July 2013 has been used (**Figure 3.14**). A landuse map showing 10 Km radial buffer with MV Puram limestone ML area of M/s The Ramco cements Limited, Chennai having 98.62 Ha spatial extent at its center is carried out. The geographical coordinates of the mining lease (ML) area may be given as 78°04' 21" E to 78° 16' 34" E longitude and 9° 12' 07" N to 9° 23' 31" N" latitude. The 10 Km radial buffer constructed for the above ML area and the radial buffer around the ML is 372.347 sq.km.

Figure No. 3.14

Remote sensing satellite image (LISS IV July 2013) of MV Puram and its environ



Selection of remote sensing satellite image (RSI) is on the availability of cloud free data and interpretability of predominant land use and land cover (LULC) category. The examination of satellite data showed that the region is always covered by clouds with lesser percentage during summer. But rainfed crops are cultivated during southwest monsoon and hence a data acquired

during first onset of precipitation is preferred so as to delineate crop and fallow land parcels of agricultural category.

Delineation of scrub land is also possible since land with scrub could be easily distinguished from crop vegetation and separated. This may be an arduous task during monsoon since the entire area would be witnessed with sudden sprout of lush natural vegetation, mostly *prosopis*, with first onset of precipitation. Moreover, data acquired during January is completely obscured by clouds. Considering all these factors, a larger resolution LISS IV data acquired on 30th July 2013 has been selected. Besides, LISS III data of relatively smaller resolution than that of LISS IV has also been studied to delineate the landuse pattern. To compare the seasonal influence as well as for impact assessment around 2 Km buffer around the ML (any abrupt change in landuse pattern owing to mining activities) has been carried out using LISS III acquired on 30th Dec 2009. Data used for the present study is listed in Table given below:

Details of satellite data used for the Landuse study

S.No	Satellite image	Date	Generated LU map
1.	R2 LISS III	30 th December 2009	➤ LU map for 2 Km Buffer area
2.	R2 LISS III	30 th July 2013	➤ LU map for 10 and 2 Km Buffer area
3.	R2 LISS IV	30 th July 2013	➤ LU map for 10 and 2 Km Buffer area ➤ LU within the Core zone

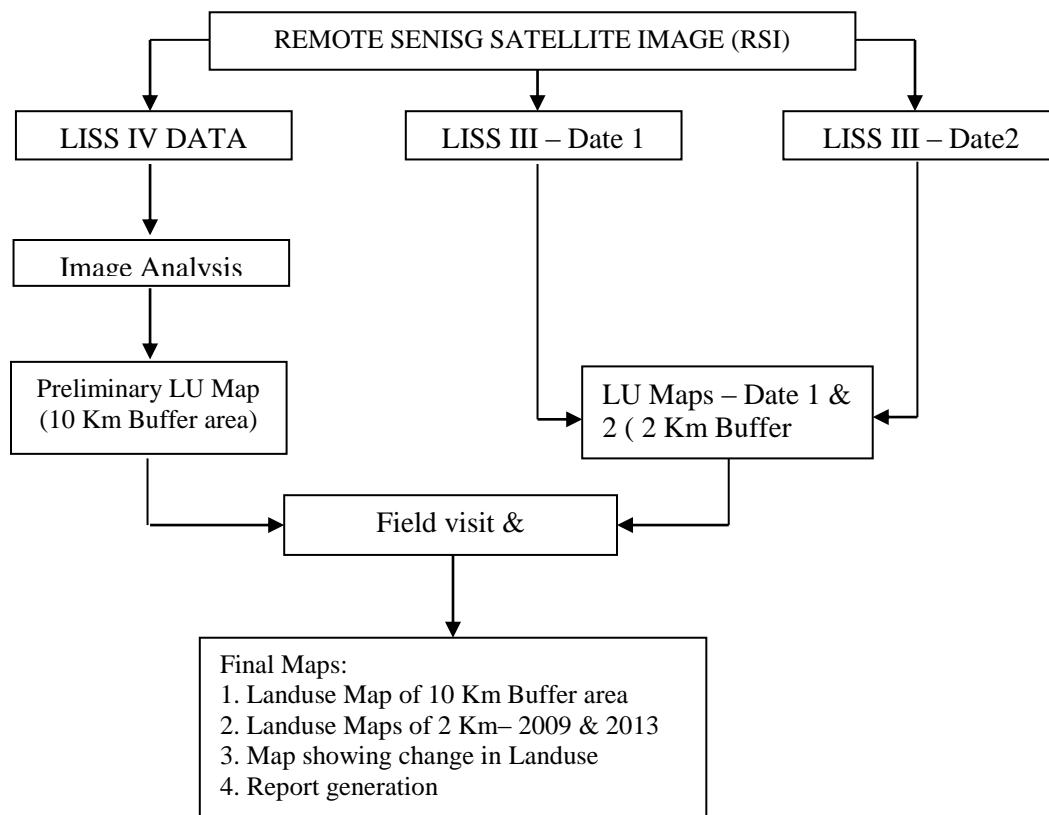
3.8.3. Methodology adopted for the landuse study of mv puram limestone ml area

Present study involves regional analysis of landuse pattern showing 10 km buffer area, secondly changes in landuse pattern using temporal satellite data and lastly, landuse within the core zone of the ML area. This necessitates a careful analysis of satellite data adopting a well defined methodology.

To cater the requirement, a preliminary assessment of terrain using digital analysis helping to infer relationship between terrain and landuse has been carried out. Temporal historical data comparing data acquired on 2009 and 2013 to assess the impact. Such an approach provides lucid understanding of landuse units and enhances the knowledge on the landuse pattern assisting in impact assessment.

The knowledge base thus generated is used to delineate various landuse units while carrying out interpretation of the satellite image. The derived landuse information is transformed into a GIS based spatial database using geo-referencing techniques. Besides, a limited but well focused field investigation also carried out and coordinates of significant landuse units using handheld GPS (Global Positioning System) are gathered to be used as control points for geo-

referencing. Interpreted landuse units are verified in the field to carryout necessary corrections wherever is required before preparing final landuse map.



Flow chart showing nature of work flow in Landuse analysis of the study area

Using the image elements such as color, tone, texture, size, shape and associated elements various landuse units are delineated following the categorization and nomenclature adopted for the national level landuse classification system as recommended by National Remote Sensing Centre (NRSC), Department of Space, Government of India. Some of the landuse units that are identified in the study area are listed in Table given below.

Major Landuse units of the study area

S.No	Major Category	Landuse unit
1	Built-up Land	Village / Town / Industries
2	Agricultural Land	Crop land Fallow land Plantation
3	Waste Land	Land without scrub Land with Scrub Barren / Stony waste
	Mining area	Mines / dumps / Abandoned quarries
4	Waterbodies	Rivers / Streams Tanks / Reservoirs

Before visually analyzing the RSI for the preparation of landuse maps, image analysis of the digital data of the RSI is carried out and the results and observations are discussed in the following section.

3.8.4. Digital image analysis of mv puram environ for land use pattern

RSI is the image representation of digital value numbers (DN) which could be enhanced, reduced and clustered using various mathematical computations. DN values are the spectral representation of objects on the earth's surface measured and stored in different spectral wavelength. Hence, each object displays different spectral properties at different spectral wavelength and shows unique behavior called as spectral signature. In the digital analysis of the RSI, such spectral values are used to group similar pixels on the basis of color (RGB), intensity and distance among similar pixels. Applying some simple techniques could bring out information about the terrain which is otherwise impossible to derive. Moreover, inherent terrain characteristics could be highlighted leading to understanding of structural control, lithological condition, landforms and drainage characteristics of the terrain. By collating with other data information on micro-level information such as soil condition and water quality could also be derived. A similar exercise using simple analytical techniques – PCA, NDVI, color inversion and textural enhancement - on digital data is implemented in the present study so as to generate basic knowledge on the terrain environment, which could be used while generating landuse information.

3.8.4.1 Principal Component Analysis (PCA) of the RSI

Principal component analysis (PCA) may be explained as dimension reduction technique to compute the common occurrence in a data set using eigen vector. In RSI, it reduces and compresses a multi-spectral image so that maximum amount of pixel information is obtained in the first band itself. This dimension reduction may bring out significant information about subtle terrain features – structures, rocks, soil, drainage and landforms. Implementation of similar technique is applied on the RSI of the study area and the resultant output is depicted in **Photo**

3.2.

A clear separation of a major litho-unit at the center is observed from the other area. Similarly, a well-defined unit in pink color in the northeastern part of the study area is also segregated emphasizing a different litho-unit. Similarly, dark blue color and pinkish red color in the southwestern part may indicate presence of natural vegetation and crop respectively. All the linear features because of their association with natural vegetation, shown in blue color, are clearly brought out from the image. Light blue color with a well-defined shape lead to inference

of the presence of mining activities within the buffer area. Such delineation of major terrain pattern would help to delineate associated landuse pattern in the study area.

3.8.4.2 Edge detection of the study area

Edge detection analysis of the RSI would help to enhance the linear features and boundaries and even called as boundary detection algorithm. A kernel with weightage values of 1, -1 and 0 is applied on the digital image and the product value would result in either increase or decrease in DN values. In this way, the pixels would be enhanced or suppressed leading to a growth of pattern showing similar pixels. Features like roads, railways, urban settlement, water bodies, streams and land parcels are extracted using this technique. A similar technique applied on RSI showing the study area is carried out and the resultant output image is shown in **Photo- 3.3**.

Examination of the figure showed that linear features such as roads including minor roads are clearly brought out. Stream course in the eastern part of the area could be observed distinctly. Boundaries of innumerable land parcels could be seen including presence of existing vegetation pattern. Another interesting pattern has also emerged showing distinct separation of various lithounits and landforms, which could be useful while interpreting the image for landuse study. Settlements have been brought out very distinctly and seen on the resultant image as bright specks. In short, linear features and boundaries of major terrain units and field boundaries could be extracted using such technique.

3.8.4.3 Textural enhancement of the RSI

Another method of enhancement of RSI is textural enhancement that could help in enhancing the interpretability of the image and bring out patterns showing similar pixels. Texture may be defined as tonal frequency and qualitatively termed as “fine”, “medium” and “coarse”. Depending upon the frequency of occurrence of pixel values, they grouped as clusters leading to the emergence of pattern. Such pattern would throw light on the terrain and landuse environment of an area. The resultant image as obtained from such analysis of the study area is shown in **Photo- 3.4**.

The resultant output image obtained from textural analysis showed almost similar terrain pattern and LULC pattern as seen in the edge detection and PCA techniques. Separation of three major terrain units – one at the center, second at the northeastern part and the third at the southwestern parts – could be observed. Presence of settlements and distribution of roads could be seen clearly in the image. Water channels and streams have also been brought out in the analysis. Intermittent red color patches may indicate presence of vegetation and could be

identified as natural vegetation or crop by their association. Grouping of pixels based on the similarity in the occurrence of spectral values have resulted in enhancement of features such as fallow land, crop land, natural vegetation, roads, streams and settlements beside mining area at the center of the image.

3.8.4.4 Normalized Difference Vegetation Index (NDVI) of the study area

Lastly, vegetation index obtained by the ratio of additive spectral values (DN) of red (R) and near-infrared (NIR) spectral region and their differences. This gives out a normalized vegetation index indicating the status of vegetation such their density, stages of growth, their spatial presence along with soil moisture condition, waterbodies and clouds. Since, vegetation has high spectral reflectance value at R and NIR region, DN values of pixels of this region would provide meaningful information on the status of vegetation. Information extracted using NDVI technique would be meaningful while examining the RSI for landuse pattern of the study area and a resultant output image is shown in **photo-3.5**.

From the figure it could be observed that most of the land parcels in the buffer area are “fallow” followed by scattered distribution of vegetation – both crop land and land with scrub. Fallow land because of soil condition shows light grey to medium grey color implying negative value. Similarly, vegetation showed positive values ranging from 0.247 to 0.317. The resultant NDVI modified pixel values indicate that the vegetative cover is poorly represented. The values obtained from NDVI analysis range from -1 to +1 with “zero” as intermediate value. Generally, cloud and snow show “zero” value with water bodies showing negative values and vegetative cover showing positive values. A larger positive value indicates (above .45) a healthier and dense vegetative cover and lesser values indicate their sporadic presence. The statistical values obtained from the NDVI computation showed value ranging from -0.22727 to maximum value of 0.67826. Statistical parameters such as mean, median, mode and standard deviation showed 0.111, 0.08754, 0.07339 and 0.069 respectively. These values may lead to the inference of less vegetative cover with more frequent barren land, in this case identified as “fallow” land. These techniques – PCA, edge detection, texture and NDVI – have provided meaningful insight with respect to the landuse pattern and its relation with terrain environment.

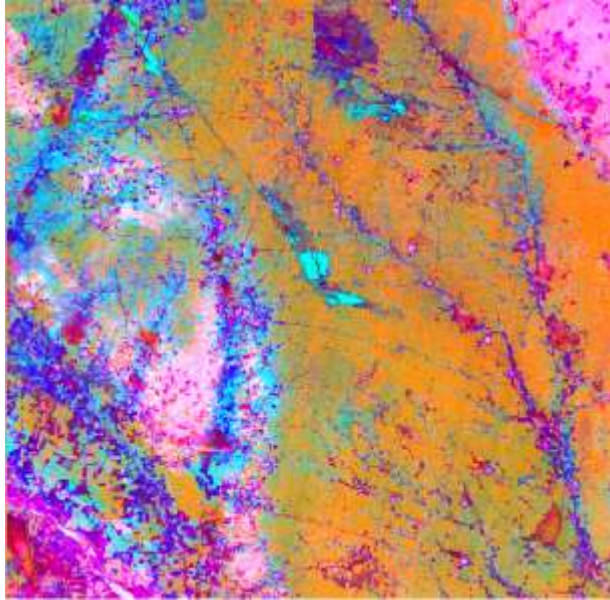


Photo 3.2. PCA of the RSI

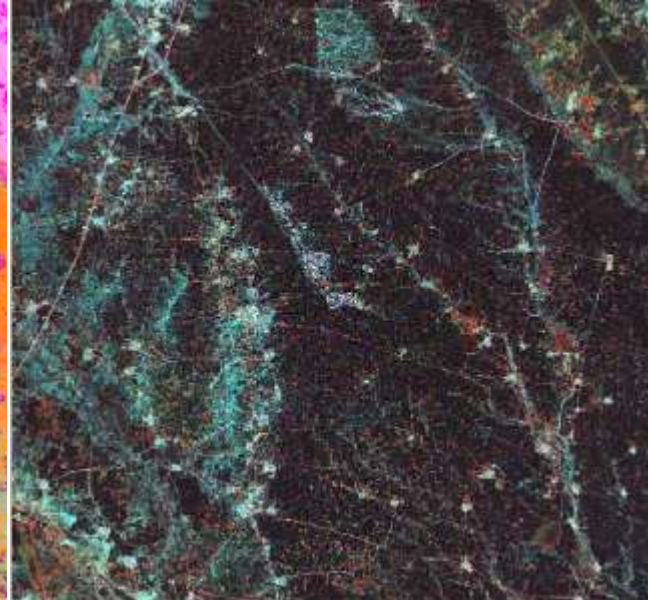


Photo 3.3. Edge Detection output of the RSI

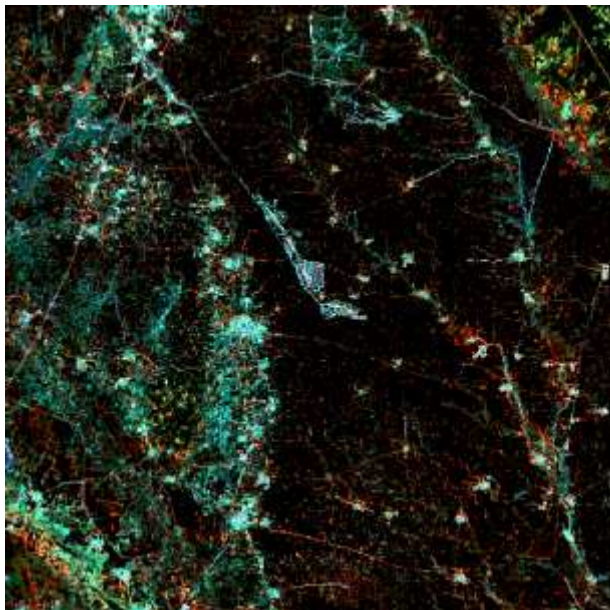


Photo 3.4. Textural enhancement of the RSI

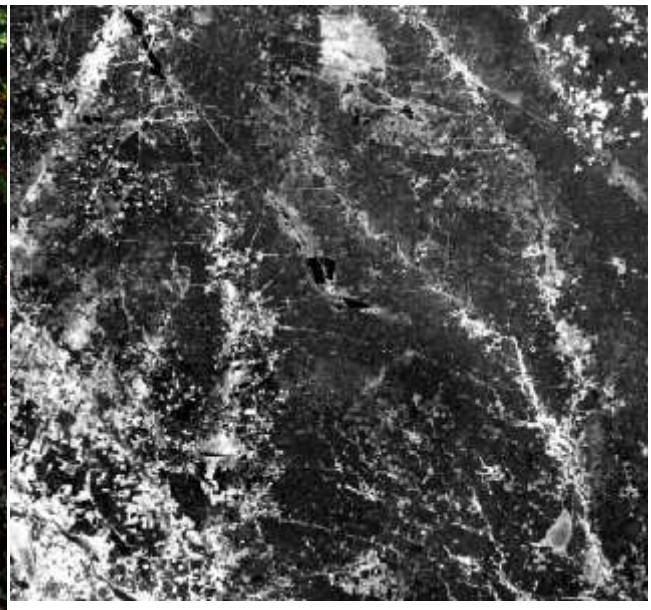
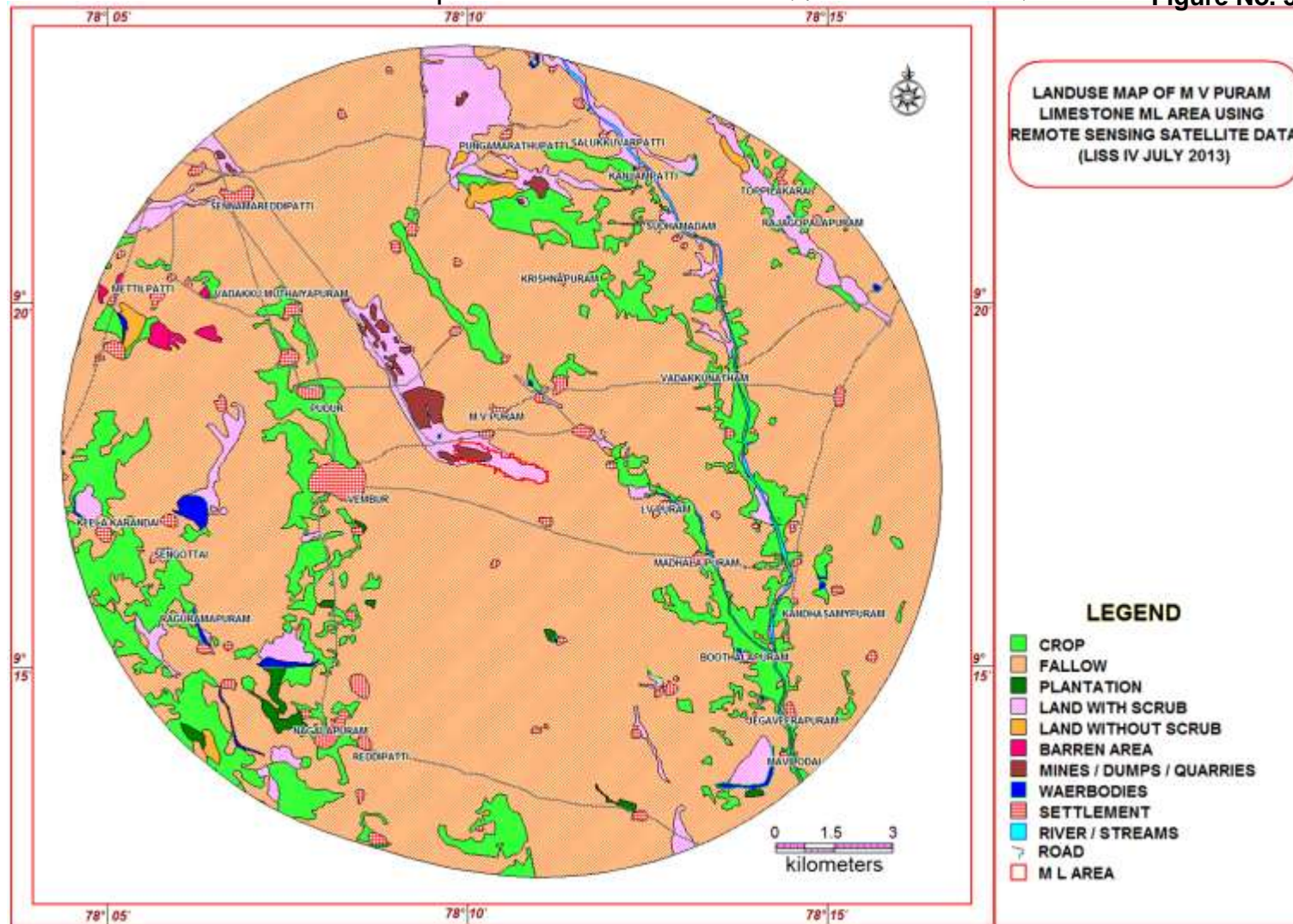


Photo 3.5. NDVI analysis of the RSI

With the information extracted from the digital analysis of the image relationship between terrain and landuse pattern could be well established. Also, separation of various landuse and terrain units would help in better understanding of the landuse pattern help in delineating various landuse categories present in the study area. A general view on the mining area and its environ could be perceived which would form a valuable knowledge base in the preparation of regional landuse map and landuse pattern within the core zone of the ML area using satellite data of larger resolution.

Landuse map of 10 Km radial buffer around MV Puram Limestone ML area Figure No. 3.15



3.8.5. Landuse pattern of 10 km radial buffer area of mv puram ml area

The general landuse pattern of the buffer may be broadly classified into four major types – settlement, agriculture, wasteland and water bodies. In the settlement, villages, town and infrastructure facilities are considered. The second category agriculture consists of crop land, fallow land and plantation. Under the wasteland category, units such as and with scrub, land without scrub, barren area, mining area and abandoned quarries is interpreted. Lastly, waterbodies such as tanks, ponds and streams are interpreted under this category. These categories are delineated from the selected satellite image using image elements such as color, tone, texture, size, shape and associated elements. The delineated landuse units are transformed into a spatial database in GIS environment. The map thus generated in GIS as shown in Figure 3.15 is estimated for area and representation of each category in the study area. The total area of LULC in the study area is calculated as 372.347 sq.km and spatial distribution of various LULC categories within buffer area are discussed below.

3.8.5.1 Built-up / Settlements

Settlements in the study area are generally small in stature and area scattered. Vembur and Pudur are the two relatively larger settlements observed at the western part of the study area. Settlements such as Kallupatti, Melavenkatasapuram, Krishnapuram, Pungamarathupatti, Ramachandrapuram, Nadukattur, Sivalarpatti, Mettilpatti, Salukuvarpatti and Kmbathupatti are delineated within the buffer area (**Photo 3.6 and 3.7**).



Photo 3.6. A major settlement - Vembur



Photo 3.7. Kambathupatti village

Interpretation of settlement from the satellite image is based upon the image elements such as color, tone, texture and association. It is delineated by their typical grey color mixed with intermittent brownish red color due to vegetation. Such spectral signatures are seen scattered indicating their nature and extent. This is also corroborated from the digital analysis as well as field checks. Association with linear features such as roads reaffirmed the presence of delineation of settlements. The spatial extent of settlement is estimated as 7.428 sq.km representing 1.99% of the study area.

3.8.5.2 Agricultural Land

Under the broad category of agriculture crop land, fallow land and plantation is delineated. Cultivation is mostly dependent upon monsoon rainfall of both southwest and northeast monsoon and irrigational activities are rarely seen. This may be due to poor groundwater and surface drainage owing to the prevailing soil condition. Black cotton soil is the predominant type in the study area and with its poor infiltration capacity encourages poor degree of groundwater storage. Ponds and tanks in each village act as rainwater storage units and do support domestic requirement and even cultivation to some extent. Because of these conditions, minimal water requiring crops such as corn, sunflower, oil seeds, grams, millets and coriander are cultivated (**Photo 3.8 and 3.9**). Corn is the most predominant crop cultivated and even if it failed their stalks are used as fodder for cattle.

During northeast monsoon, sunflower is cultivated predominantly in the entire buffer area. Interestingly, *prosopis*, a thorny scrub plant that grows as thorny natural vegetation is also grown in field. They are used for fuel wood and used to make wood charcoal benefitting the local community economically (**Photo 3.10**). This type of cultivation owing to terrain constraints could sometime lead to confusion among crop area and land with scrub.

Red color, smooth to medium tone, medium texture, geometrical shape and association with fallow land has helped to delineate crop land. Patches of crop land are seen around Vadakunatham, Krishnasampuram, Madhalapuram, Jegaveerapuram, Pudur and Vembur. Spatial pattern of crop land suggest their existence along the streams and water channels. The pattern reiterates the influence of terrain condition in the agricultural activity.

Spatial extent of crop land is estimated at 40.794 Sq.km representing 10.96% of the total buffer area.

Fallow land are interpreted using their image elements such as light to dark grey, smooth to medium tone, smooth to medium texture and their typical geometrical shape. They are the most predominant landuse category delineated in the buffer area. As explained earlier,

cultivation mostly depends upon rainfall, and majority of the land parcels are tilled and ready for cultivation with even a scanty rainfall. Hence, fallow is the predominant category estimated at 295.224 Sq.km representing 79.29% of the buffer area (**Photo-3.11**).



Photo 3.8 Crop land near Nadukattur



Photo 3.9 Coriander and Corn near Sudhamadam



Photo 3.10 Charcoal making from Prosopis



Photo 3.11 Fallow land near Vadakkunatham

The land parcels under “fallow” suddenly sprouts into life with crops and natural vegetation during monsoon with local community using the rainfall available during the season to practice agriculture. Similarly, plantation is rarely seen in the buffer area and seen as a small patch near Mel Karandai. They are identified by their typical brown color and association with

crop land and waterbodies. They represent an area of 1.290 sq.km covering 0.35% of the total buffer area. The total area estimated under this category is 337.301 sq.km representing 90.59 % of the total buffer area (372.347 sq.km).

3.8.5.3 Wasteland

The last category of the land use units in the study area is “wasteland”, which denotes land parcels that could not be utilized for cultivation even after conservation measures – such as land with scrub, land without scrub and barren / stony area and abandoned mines and quarries, and mining area.

Next to agricultural area, natural vegetation such as land with scrub forms the predominant LULC category of the buffer area. Land with scrub is sparse and delineated as patches scattered in all the parts of the buffer area. The spatial pattern of scrub suggests it is closely associated with water courses. A linear patch in the eastern periphery is closely identified with some minor nallas in that area. A large patch in the northeastern periphery (near Maravarperungudi) showing a geometrical pattern indicated presence of high density of natural vegetation such as *prosopis*, *acacia* and other wild shrubs and bushes. A vast stretch of land covered with scrub is also seen around the mining area near Melavekateshwarapuram. Separating land with scrub is tedious since they show identical pattern with agricultural vegetation but their typical color and tone have helped to differentiate and interpret them. They show red color, smooth to medium one and medium texture and closely associated with settlements and waterbodies. Almost all the dry beds of waterbodies are observed with scrub plants. Scrub is also observed along the waterbodies near Vembar, Mettilpatti, Mel karandai and Pillayarnatham in the northeastern periphery (**Photo 3.12 and Photo 3.13**). This category occupies an area of 20.317 sq.km representing 5.46% of the total buffer area.

Land without scrub, on the other hand is interpreted using brown to yellowish white color, medium tone and medium texture and is generally restricted around land covered with scrub and fallow land (**Photo 3.14**). Absence of red color indicating absence of vegetation and their presence as intermittent patches with in scrub land has helped to interpret and delineate this category. They occur as small patches and very minimal area covering 1.779 sq.km representing 0.48% of the buffer area. Similar to that, barren area is also interpreted by their image elements such as white color, smooth tone, medium texture and close association with mining area. It is very meager in spatial extent and covers an area of 0.698 sq.km (0.19%) and mostly confined around mining area.

Lastly, mining area covers a spatial extent of 1.877 sq.km representing 0.50% of the buffer area. Limestone mine near Melavekateshwarapuram is interpreted by their bright white color, smooth tone, smooth texture and having a definite shape (**Photo 3.15**). Dumps are interpreted mostly by their association with mines and they show image characteristics such as light grey color, smooth tone, medium texture and are often covered with shrubs and plants.



Photo 3.12 Land with Scrub near Pillayarnatham



Photo 3.13 Land with scrub near Mettilpatti



Photo 3.14 Land without scrub near Maravarperungudi



Photo 3.15 L.st mine near Melavenkatesapuram

3.8.5.4 Water bodies

Many small and big water bodies are seen in the study area distributed all over the study area. Water bodies are the storage units for water act as rainwater harvesting structures. They

support the domestic water requirements and for cattle (**Photo 3.16**). At some places, they may also use for irrigation purpose and are very limited. Few dry stream courses are also seen in the study area. In the satellite image, water bodies are interpreted by their light blue to greyish blue color, smooth tone and smooth texture. They show an arcuate to curvi-linear shape. Their dry beds are covered with vegetation such as prosopis and acacia. Hence a dark red color tone and medium tone and texture are also associated with the image characteristics of waterbodies.



Photo 3.16. A pond near Pillayarnatham



Photo 3.17. A dried up tank near Vadakkunatham

Most of the waterbodies retain water for a shorter period after precipitation due to the soil constraint and hence go dry soon (**Photo 3.17**). Spatial extent of stream and waterbodies is estimated at 1.313 sq.km and 1.625 sq.km respectively. The area of various landuse categories as derived from the satellite data within the buffer area is given below:

Landuse Categories within 10 Km Buffer zone and their Spatial Extent

S.No	Landuse Units	Area (Sq.Km)	Percentage
1	Crop Land	40.795	10.96
2	Fallow Land	295.224	79.29
3	Plantation	1.290	0.35
4	Land with Scrub	20.317	5.46
5	Land without Scrub	1.779	0.48
7	Barren Area	0.698	0.19
8	Mines / Mining Dumps	1.877	0.50
9	Waterbodies	1.625	0.44
10	Settlement	7.428	1.99
11	River	1.313	0.35
Total		372.347	100.00

The regional study covering 10 km radial buffer is further carried out to understand the changes in the spatial pattern of landuse by comparing historical 2009 data with current data (2013) around 2 Km buffer around the ML area. To carry out such study, IRS R1 LISS III data acquired on 30th December 2009 has been compared with recent data using R2 LISS IV data acquired on 30th July 2013 around 2Km radial buffer of ML area.

3.8.6. LANDUSE PATTERN WITHIN 2 KM BUFFER AROUND MV PURAM ML AREA

Landuse pattern within 2 Km buffer area could be meaningful to generate a spatial database on landuse so that any changes within the buffer may be periodically monitored for impact assessment and proper mitigation or conservation measures could be implemented. In the present study, satellite data of 2009 (**Photo 3.18**) has been compared with satellite data acquired on 2013 (**Photo 3.19**), and the resultant observations are discussed below.

3.8.6.1 Landuse Pattern around the ML area during 2009

Landuse pattern within 2 Km radial buffer area around the MV Puram limestone ML area using IRS R1 LISS III has been interpreted similar to the landuse map generated for 10 Km buffer area. Similar landuse categories and nomenclature are adopted to delineate various landuse units within the buffer area.

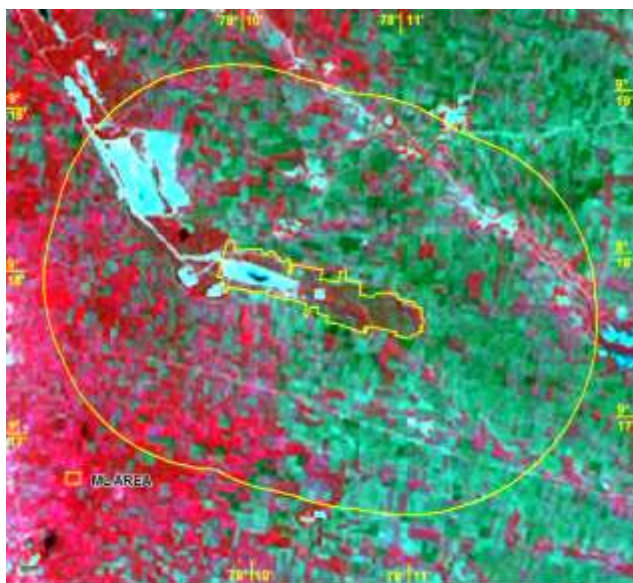


Photo 3.18. RSI Data of R1 LISS III (Dec 2009)



Photo 3.19. RSI Data of R2 LISS IV (July 2013)

Image characteristics of landuse units such as color, tone, texture, shape and association are almost identical showing similar pattern and hence, interpreting landuse units with the knowledge derived from digital analysis and field check has become easier. The total area for 2Km buffer around the ML area is estimated at 25.255 sq.km. Major landuse categories that are identified include 2 Km buffer around the ML covers an area 28.669 sq.km and

interpreted with landuse categories such as crop land, fallow land, plantation, land with scrub, land without scrub, mines / mining dumps, waterbodies and settlements.

The landuse map derived from the remote sensing satellite acquired on December 2009 is shown in **Photo 3.20**. The spatial pattern suggests a predominant presence of crop land within the buffer area. This may be owing to the occurrence of monsoon with cultivation practiced earnestly despite soil limitation. Moreover, large patch of natural vegetation also sprouts up leading to mixing of spectral signatures which is difficult to separate due to the resolution of the data. But still, it could be visibly seen that agriculture activities take place in a full swing during this period and allows understanding the dynamism of landuse pattern.

Crops such as corn, sunflower, cotton, coriander, ragi, bajra, other millets and grams are cultivated. Paddy cultivation is very negligible and almost absent in this part. The area estimated from the spatial analysis indicate that crop land and fallow land are present equally representing 42.32% and 42.88% of the total buffer area respectively. This again leads to inference of landuse constraints within the buffer area. This category is followed by land with scrub representing 9.58% of the 2 Km buffer area.

3.8.6.2 Landuse Pattern around the ML area during 2013

Similar to the historical data, landuse map derived from the remote sensing satellite acquired on July 2013 is shown in **Photo 3.21**. During this period, the spatial pattern shows a predominant present fallow land and crop is almost absent. This may be due to seasonal effect since the data represents southwest monsoon period. The comparative analysis of these two data has brought not only the temporal changes among landuse pattern but has highlighted seasonal changes as well. Upon examining the landuse map, it could be seen that the entire 2Km buffer area is under “fallow” land category suggesting a dynamic oscillation of land parcels between “crop” and “fallow” land. But interestingly, the spatial pattern shown by land with scrub remains almost unchanged reiterating the climatic influence and terrain constraints for cultivation in the study area.

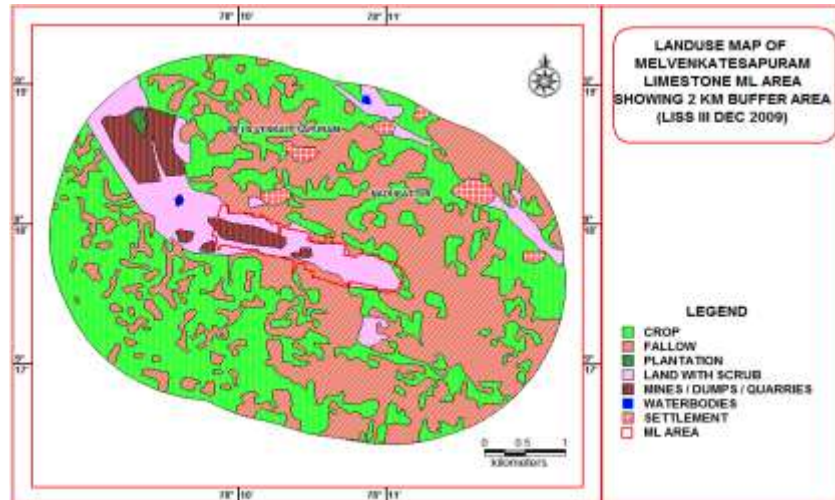


Photo 3.20. Landuse Map of 2 Km Buffer around the ML area – 2009

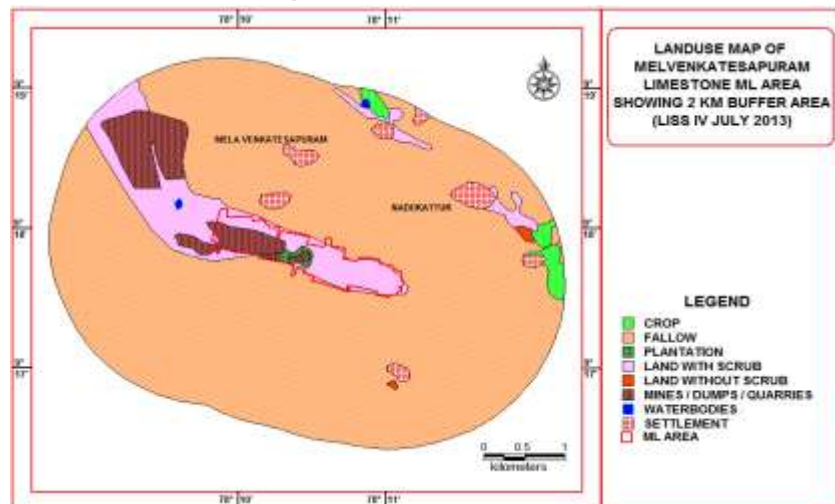


Photo 3.21. Landuse Map of 2 Km Buffer around the ML area – 2013

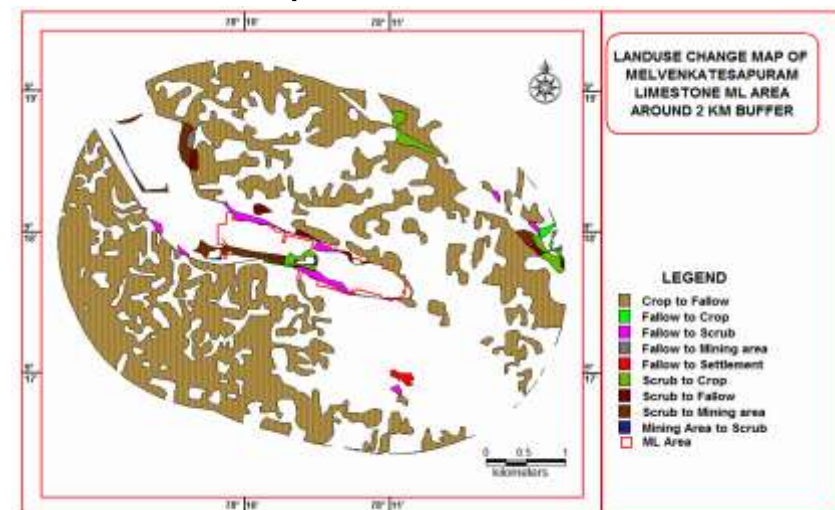


Photo 3.22. Landuse Change Map of MV Puram Limestone ML area

During this period, few land parcels are also seen cultivated with dry crop, which may be with oil seeds and millets. Waterbodies remain same and a slight increase in the spatial extent of settlements is observed. Spatial estimation of some of the common landuse categories such as crop land, fallow land, scrub, and mining area as derived from GIS analysis may be 0.285 sq.km, 21.21 sq.km, 2.102 sq.km and 1.115 sq.km respectively. The landuse pattern suggests changes within the agricultural category only, that too due to the constraints of soil and water availability. Area of various landuse categories estimated for both the periods (2009 and 2013) is tabulated in given below:

Landuse units within 2 Km Buffer zone and their Spatial Extent

S.No	Landuse Categories	Area (2013)	% of Area	Area (2009)	% of Area	Difference
1	Crop Land	0.285	1.13	10.689	42.32	-41.20
2	Fallow Land	21.210	83.99	10.829	42.88	+41.11
3	Plantation	0.063	0.25	0.046	0.18	+0.07
4	Land with scrub	2.102	8.32	2.420	9.58	-1.26
5	Land without Scrub	0.040	0.16	---	---	+0.16
6	Mines / Mining Dumps	1.115	4.42	0.874	3.46	+0.95
7	Waterbodies	0.023	0.09	0.023	0.09	0.00
8	Settlements	0.417	1.65	0.374	1.48	+0.17
Total		25.255	100	25.255	100	

The spatial pattern of comparison of both the periods is shown as landuse change map in Photo 3.22. The spatial pattern revealed that the “fallow” land parcels are very dynamic and changes into “crop” land with season as the area receives heavy rainfall during monsoon period. The area of different landuse categories also suggest that there is no marked change in the agricultural area as a whole combining crop, fallow and plantation.

The analysis of studying landuse pattern within 2 Km buffer area is significant in the following ways:

- meaningful monitoring of landuse pattern which would reflect on environmental issues
- helpful in assessing the impact around the ML area
- to identify the causative factors for environmental impact such as either due to mining activities or natural or man-made

Hence, it would be more meaningful to annually update the spatial data at a definite periodic interval so as to enhance the landuse monitoring system and in turn the environmental condition around the ML area.

3.8.7. Study of landuse pattern within mv puram core zone using *liss iv* data

The landuse analysis study of MV Puram limestone ML area, at its last phase, induct the utility of generating landuse database in GIS format showing core zone landuse details using larger resolution satellite image.



Photo 3.23. LISS IV Data showing MV Puram Limestone ML Area

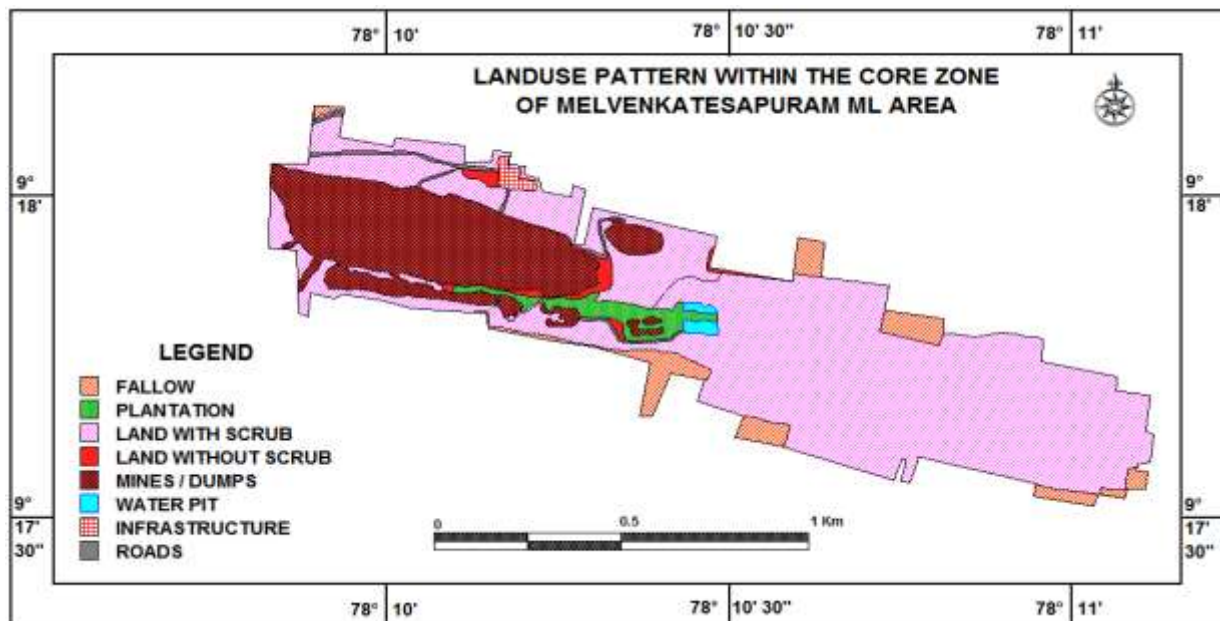


Photo 3.24. Landuse Map from LISS IV Data of MV Puram Limestone ML Area

The boundary condition of ML using its coordinates is transformed on to the larger resolution satellite data LISS IV image of 5.6m resolution (**Photo 3.23**) in GIS environment and interpreted for generation of Landuse map for the ML area (**Photo 3.24**).

A near accurate real time condition is generated so that the image elements exactly match with the terrain elements. The interpretation of the image has led to the delineation of various landuse categories such as fallow land, plantation, land with scrub and land without scrub, mines and dumps along with water storage pit, infrastructure and road. Spatial pattern and estimation of these categories as derived from GIS analysis of the satellite data suggest predominance of land with scrub within the ML area covering 63.235 Ha representing 64.12 percentage of the ML area. This is followed by presence of “fallow” land parcels (5.858 Ha) and plantation. Two small pits are seen within the ML area and are identified as water storage units with the aid of collateral data. Table 3.15 shows are of various landuse units delineated within the ML area and their respective spatial representation.

Table 3.15. Landuse Categories within the Core Zone and their Spatial Extent

S.No	Landuse Categories	Area (in Sq.km)	Area (in Ha)	Area %
1.	Fallow Land	0.05858	5.858	5.94
2.	Plantation	0.02839	2.839	2.88
3.	Land with Scrub	0.63235	63.235	64.12
4.	Land without Scrub	0.01423	1.423	1.44
5.	Mines / mining Dumps	0.23094	23.094	23.42
6.	Water pit	0.00526	0.526	0.53
7.	Infrastructure	0.00563	0.563	0.57
8.	Road	0.01082	1.082	1.1
	Total	0.9862	98.62	100.00

3.8.8. Recommendations

With the observations and inferences from the above detailed analysis using remote sensing satellite data around 10 km buffer of the ML area, the following recommendation may be made with respect to monitoring landuse pattern around the ML area.

1. A periodical monitoring and updating of landuse pattern at an annual interval within the ML and around 2Km buffer of the ML area using large resolution (LISS IV) satellite data.
2. Generation of landuse information using larger resolution (LISS IV) satellite to update extent of changes within the ML area.

3. A holistic spatial database comprising terrain parameters such as lithology, landform, soil, slope, drainage along with climatic condition including groundwater fluctuation would provide valuable information on the landuse pattern and in turn impact assessment as well as causative factors.

3.8.9 Conclusion

The study may be concluded with following observations and inferences from the analysis of remote sensing satellite data.

1. The study area is predominantly covered by agricultural land – crop, fallow and plantation and dependent mostly upon the monsoon rainfall.
2. The digital analysis of the satellite data has helped to appreciate the intricacies of terrain parameters in controlling landuse pattern of the study area.
3. Landuse pattern shows constraints in crop cultivation in term of land capability, soil and water availability and mostly left as “fallow”.
4. Rainfed crops such as oil seeds, sunflower, ragi, maize, millets, grams, coriander and corn are cultivated. The stalks of corn are used as fodder when crop failed due to paucity of sufficient rainfall.
5. Most of the land parcels are kept as “fallow” and readied for cultivation during monsoon periods – both southwest and northeast monsoon.
6. Interestingly, naturally growing thorny scrub, *prosopis*, is also cultivated in the field. It is used as fuel wood and burnt to produce charcoal. This lead to the inference on the severe limitation imposed on the cultivation practice.
7. Multi-temporal analysis comparing landuse pattern generated from temporal data (2009 and 2013) has brought out the dynamism of landuse units emphasizing the dependence of landuse on rainfall, with limited irrigational facilities available in the buffer area including groundwater resources.
8. Larger resolution data (LISS IV) has helped to separate various landuse classes and delineate them more accurately. The spatial database generated using GIS have helped to estimate the spatial extent of these landuse units and their representation in the study area.
9. Use of LISS IV to generate various landuse categories within the core zone and estimating their spatial extent using GIS has helped to construct a valid landuse database of ML area.
10. Finally, the study could be concluded with a suggestion to monitor landuse pattern of 2 Km buffer around the ML area and landuse within the ML area at a periodical interval, annually, enabling more meaningful impact assessment and causative factors and plan for effective remedial measures.

3.9 HYDROLOGICAL CONFIGURATIONS:

Detailed Hydro-geological assessment studies carried out at the Melavenkateswarapuram mining lease area and its details are given below:

3.9.1 PHYSIOGRAPHY AND DRAINAGE:

The surface elevation of the study area encompassing 10 km radius buffer zone varies from 75m to 45m msl with a general slope from NW to SE.

In the mining block, the elevation range is from 53 to 60m msl.

There is no major or minor river flowing in the area, with only small seasonal streams draining in to Vaippar River during monsoon periods.

However, some minor and major nallahs are seen on the eastern and southeastern sides. The nallahs traverse the buffer zone area from NW to SE. Apart from the above, there is no major drainage course in the mining lease area.

The surrounding land areas are mostly of dry type with seasonal crops raised in there.

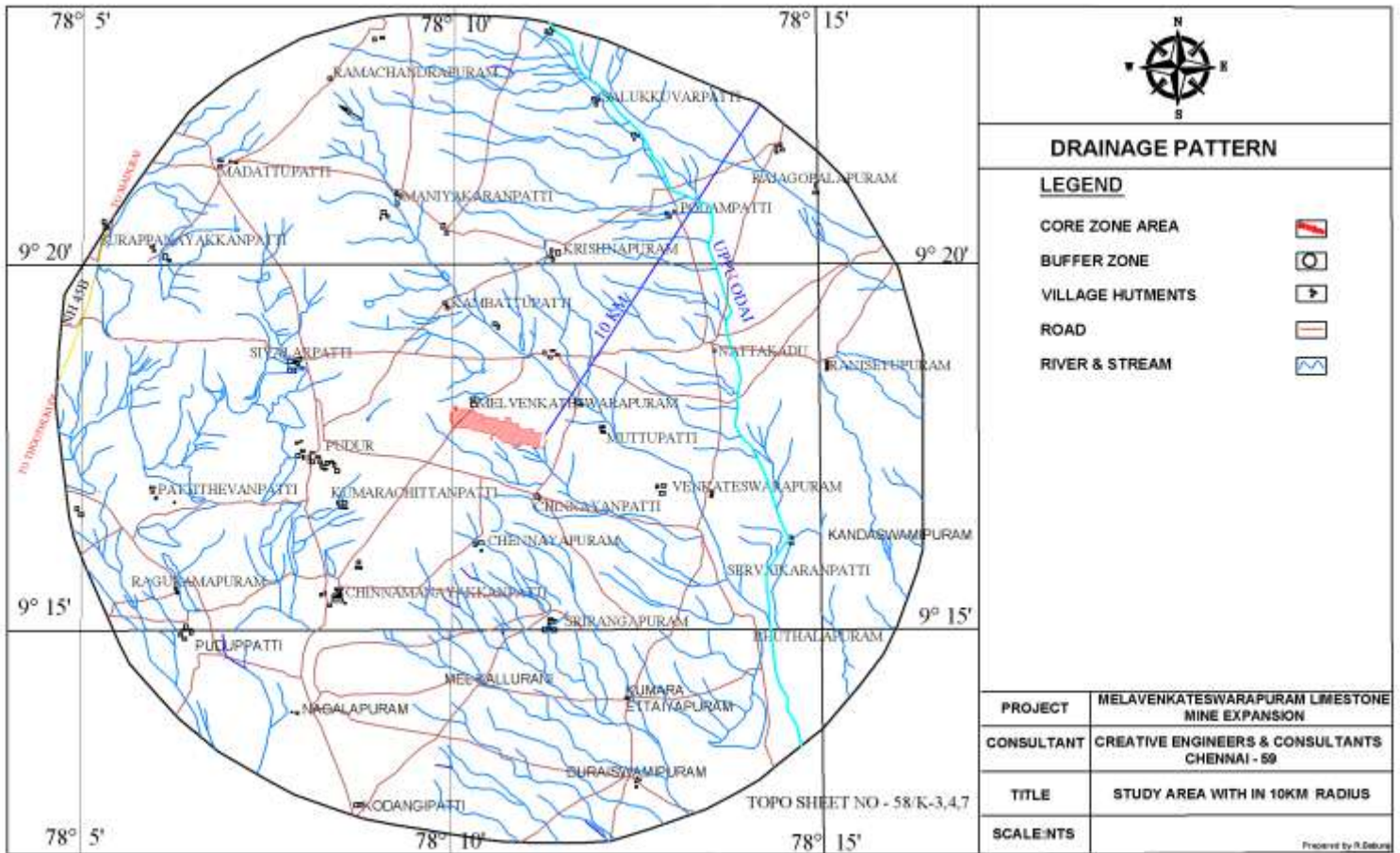
. The Drainage Pattern of Core Zone & Buffer Zone area is enclosed as **Figure no 3.16**

3.9.2 WATER LEVEL DATA:

Detailed inventory of dug wells and bore wells are carried out in the core and buffer zone areas and this survey includes 6 nos of drinking water dug wells and 20 nos of agriculture dugwells as well as 28 nos of borewells fitted with hand pump. In all 54 ground water wells are covered. Based on the details, the water table contour is presented in **Figure-3.17** which shows that the regional flow direction of water table is NW to SE.

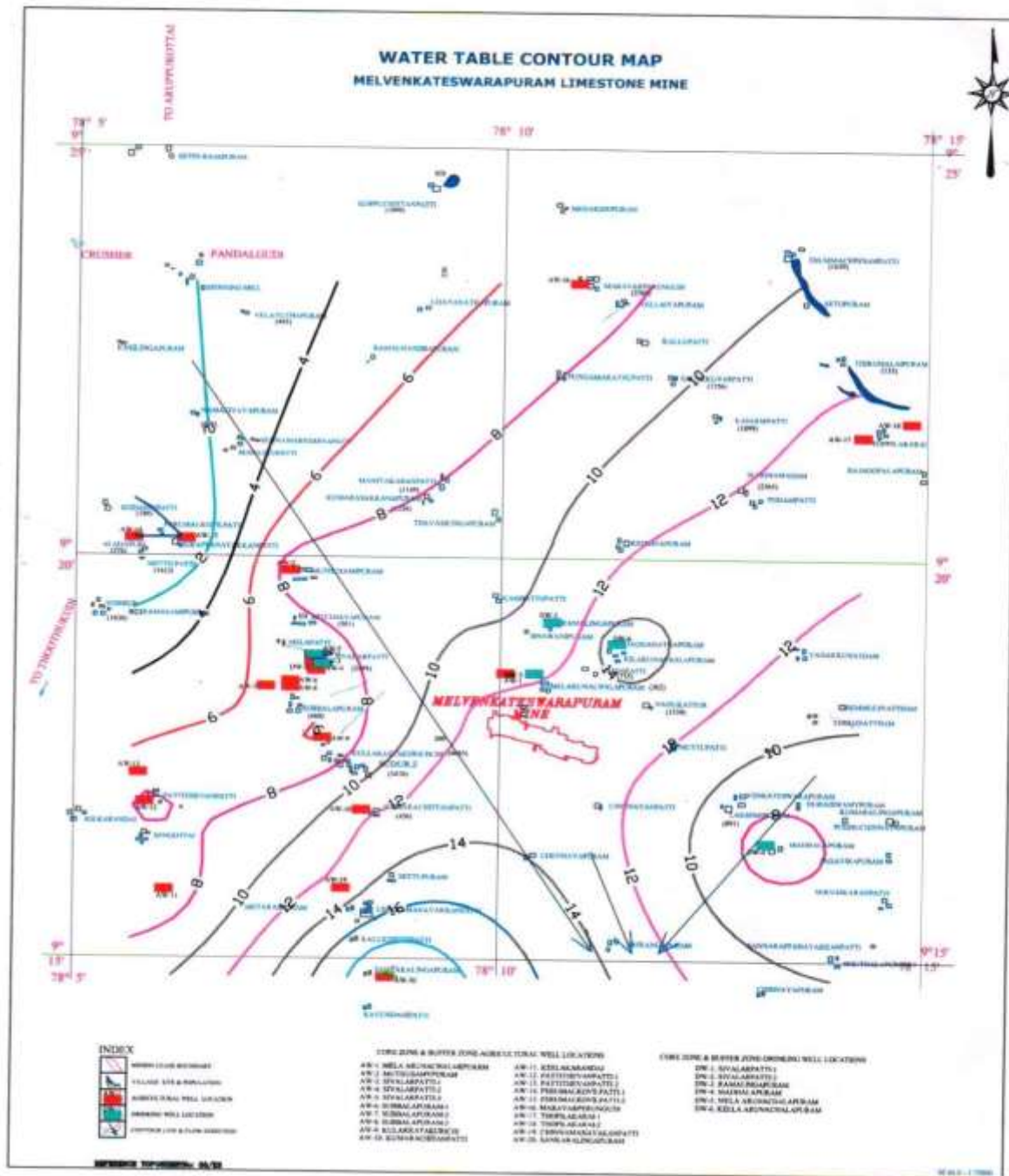
DRAINAGE PATTERN OF CORE & BUFFER ZONE

Figure No. 3.16



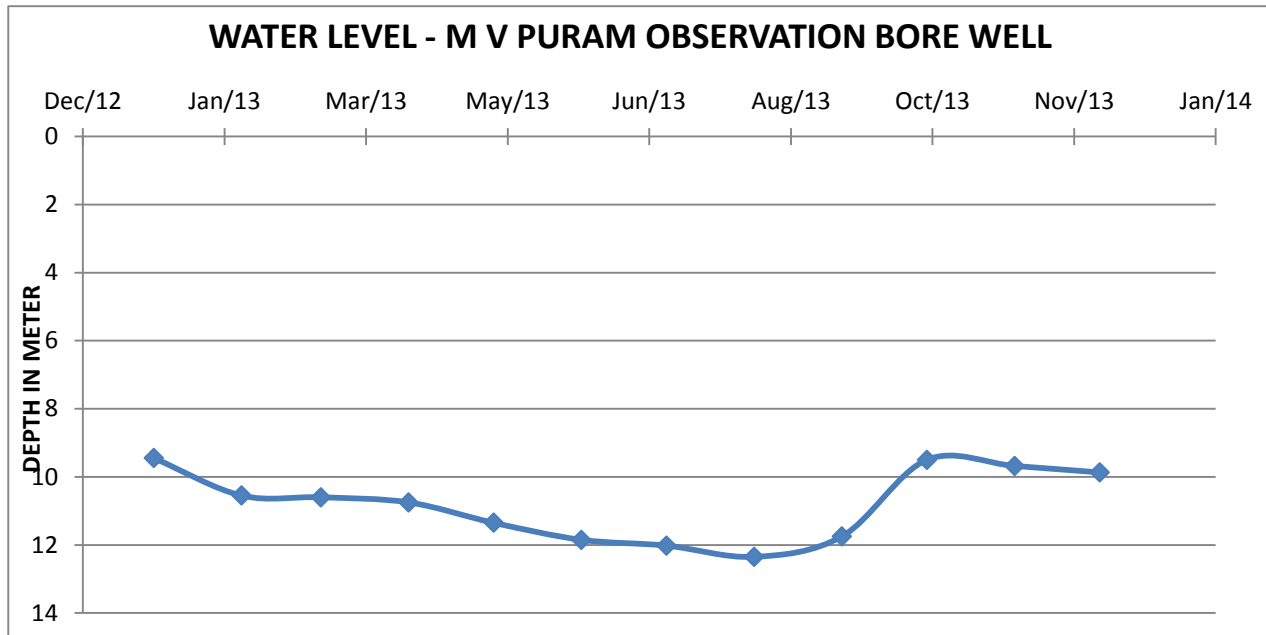
WATER TABLE CONTOUR MAP

Figure No. 3.17



Hydrograph based on the Water levels data recorded in the Observation well which is located near the Mines area is given in **Figure No.3.18** below:

Figure No. 3.18



From the above it is seen that there is no major change in the water level throughout the year.

3.9.3 HYDROLOGICAL FEATURES OF MINE PIT AREA:

Within the mine pit, the ground water occurrence zones could be traced to the wetted surfaces on the freshly exposed mine faces at certain levels.

During the initial phase of mine excavation, ground water was intersected at about 12m depth with small quantity seeping in to the mine floor.

But with deepening of the mine and formation of lower benches, this seepage gradually diminished and the next intersection of around water zone occurred in the limestone formations at depths of 25 to 28m. This seepage water from this zone is also not occurring for the entire length of the mine face and in the vertical section, this seepage is limited to certain depths and at certain longitudinal section in the exposed limestone bench.

The water bearing zone contained in the limestone beds is mostly confined to cracks, fissures and crevices within the limestone. This has a limited areal 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 mine lease boundary.

Generally, in hard rock component comprising fractures and the matrix rocks, fractures only serve as higher conductivity conduits for flow of ground water. Such flows through fracture are also controlled by their width, horizontal continuity and size as well as vertical connection with other fractures/cracks above and below. The matrix rocks may hold water but they are seldom permeable. They do not also generally release water unless they also contain smaller fracture for flow of water.

When these saturated zones are freshly intersected, seepage of water could be seen with diminishing quantity with time of exposure and progressive removal of limestone.

This seepage is not also uniform in all directions and it is finally collected in the sump at the mine floor for pumping out on to the surface. However, seepage water flow is noticed from the joint planes at the contact zones of limestone beds with pyroxine granite.

In the above hydrological scenario, the ground water zones in the limestone are not homogeneous and non-isotropic with limited areal extent. Their vertical and horizontal continuity is also limited to the size, scale, length and width of the cracks.

With progressive removal of limestone, water bearing section is also removed both vertically and laterally with corresponding significant reduction in the seepage volume from limestone beds. The lateral continuity of the zone is also limited to the width of the limestone bed up to its contact with hard rock.

Further, the pumping test conducted at Pandalgudi mine site has also shown a very low 'T' value of $0.38\text{m}^2/\text{day}$ and 'k' of 0.06 m/day . The average discharge obtained from the pumpwell was also as low as 5 litres/minute under a very steep drawdown of 26.84m. There was also no measurable drawdown in the close by observation well indicating a steep vertical cone of depression in the pumpwell with no lateral extension due to poor permeability.

Another pump test conducted at the north-west corner of the mining lease area to the depth of 120m indicated a low 'T' value of $0.71\text{m}^2/\text{day}$. In this borewell also, a fracture was encountered at 44m depth and below this depth, only very few small fractures could be expected.

This borewell intersected limestone between 2 and 18m and again from 24 to 51m with inter bed of weathered gneissic rock at 18 to 24m.

Also surface geophysical resistivity survey conducted outside the mineralized zone generally indicated fractures with groundwater potentials at depths below 80m.

A random geophysical resistivity survey conducted close to M. V. Puram site also indicates occurrence of more hard and compact nature at depths. Probably, the lower limestone beds

below the present working level may be more compact, consolidated and hard than the upper zones. Hence seepage volume from these lower horizons should also be correspondingly less.

Even as of now, the seepage volume from the limestone beds in the second and third benches is observed to be generally about 10 to 20m³/day.

Hence even with deepening of the mine, the seepage quantum is expected to be within 20m³/day and may even get gradually reduced in flow quantum.

However, it is observed, that there is almost continuous flow of seepage from the contact joints between limestone beds and the adjacent pyroxine granitic rocks. This seepage from the first such joint plane at limestone & rock intersection flows down through freshly exposed joints at the subsequently formed lower limestone benches.

It is also observed that the water level in an observation located near the mine area, shows fluctuations of lower level in summer and higher level in the monsoon period.

Such seepage flow quantity finally flowing down to the mine floor at the deeper limestone formations is now observed to be varying between 60 and 80 m³/day.

Hence, this seepage flow of 60 to 80m³/day from contact zones together with earlier identified 10 to 20m³/day flow of seepage water from exposed limestone faces, results in around 90m³/day of total flow in to the mine pit and expected to remain same for further future depth conditions also.

* * * * *

CHAPTER – IV

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATIVE MEASURES

4.1 GENERAL:

Opencast mechanized mining operation in Melavenkateswarapuram lease is in progress for past many years smoothly technically and efficiently so as to meet the limestone needs of TRCL's own captive cement plant situated close by at Ramasamy Raja Nagar.

The existing environmental status in the area is so far devoid of any adverse impacts due to the following reasons:

- Deployment of 10.0 KLD mobile water tanker for fugitive dust suppression in haul roads
- Periodical maintenance of plant & machinery
- All the internal roads are mostly made pukka
- Transportation of limestone from the mine to the Ramasamy Raja Nagar cement plant through dedicated pukka road.
- 2 nos of settling / recharge pond has been constructed with the size of 90m x 50m x 3.0 m and 60m x 40m x 3.0 m dimension & Garland drains for a length of 1.2 km x 2 m x 2m to arrest siltation and channelizing storm run-off water.
- One settling / recharge pond proposed to be constructed with the size of 100m x 40m x 2.5 m after expansion
- Plantation of about 10100 saplings in and around MV Puram mines area.
- Good blasting practices with use of Latest Blasting techniques like NONEL, Electronic System of Initiation system to maintain charge per hole and charge per delay as the same.
- Avoiding blasting by using Primary Breaker and secondary breaker wherever possible

This is amply supported by the fact that the regular monitored data of all the environmental components are within the permissible / acceptable limits.

Besides TRCL has established sound corporate environmental management system along with occupational health and safety management systems in all their mines and Cement plants.

Further it is relevant to mention that in appreciation of good environment and safety management, TRCL has received the following awards for their mines catering the needs of

R.R.Nagar mines in the year 2016-2017 (**Refer Photo 4.1& 4.2**). Besides, every year TRCL has been receiving prizes in both Mines Safety week and Mines Environmental Week (MEMC week) Celebration.

LIST OF PRIZES - ME & MC WEEK CELEBRATION -2016 South Zone			
A – CATEGORY MINE			
S. No.	Category	PRIZE	NAME OF THE MINE
1	Afforestation & Plantation	Second	Pandalgudi Limestone Mines
2	Air Pollution control	Second	Sivalarpatti Limestone Mines
3	Management of Sub Grade Mineral	First	Pandalgudi Limestone Mines
4	Management of Sub Grade Mineral	Second	Melavenkateswarapuram Mines
5	Publicity & Propaganda	First	Pandalgudi Limestone Mines
6	Overall Performance	Second	Pandalgudi Limestone Mines

LIST OF PRIZES - ME & MC WEEK CELEBRATION -2017 South Zone			
A-Category Mines			
S.NO.	CATEGORY	PRIZE	MINE
1	Afforestation	First	Pandalgudi Limestone Mine
2	Waste dump management	Second	Sivalarpatti Limestone Mine
3	Mineral Conservation	Second	MV Puram Limestone Mine
4	Reclamation & Rehabilitation	First	Pandalgudi Limestone Mine
5	Mineral Conservation	Second	Pandalgudi Limestone Mine
6	Publicity & Propaganda	Second	Pandalgudi Limestone Mine
7	Overall Performance	Second	Pandalgudi Limestone Mine

Safety Week Celebration – 2016 (A – Category Mines)			
S. No.	Category	PRIZE	MINE
1	Face working condition and face machinery	FIRST	Pandalgudi Limestone Mine
2	Ore handling & workshop facilities	FIRST	Pandalgudi Limestone Mine
3	Worker's Participation in Safety Mgmt.	FIRST	Sivalarpatti Limestone Mine
4	Personnel protective equipments	FIRST	M V Puram Limestone Mine
5	Transport/ workshop facilities	FIRST	Pandalgudi Limestone Mine
6	Injury rate performance	SECOND	M V Puram Limestone Mine
7	Vocational Training & Training Centre	SECOND	Pandalgudi Limestone Mine
8	Electrical Installations	SECOND	Pandalgudi Limestone Mine
9	Blasting, storage & use of Explosives	SECOND	Sivalarpatti Limestone Mine
10	OVERALL PERFORMANCE	FIRST	Pandalgudi Limestone Mine



Photo 4.1-Mines Environment & Mineral Conservation week Celebrations 2016 South Zone



Photo 4.2-Safety Week Celebration – 2016 (A – Category Mines)

This is a testimony of the corporate policy of TRCL in the sustainable development of the region.

There are about 6 mining leases, working in buffer zone area of this mine. The combined impact of various environmental attributes like Air quality, Water quality, noise status, etc are also reflected in the presently monitored Environmental scenario, described in Chapter III which shows that all monitored parameters are well within statutory standards prescribed by MOEF, CPCB, TNPCB, etc. This reveals that proper enforcement of various regulations like MCR 1960, Mines Act 1952, etc are properly observed in mining and that proper implementation of various control measures for preservation of environment are carried out promptly and aptly.

This proposed expansion of MV Puram Limestone mine from 0.101 MTPA to 0.5 million tonnes (0.72MTPA of ROM) will be carried out within the existing lease area only and as such no additional land is required.

However, due to expansion of mining activities there may be some additional impacts on various environmental attributes. As such, detailed impact assessment studies and planning of appropriate control measures have been undertaken for the proposed expansion project. The study details are elaborately described below.

4.2 AIR ENVIRONMENT:

4.2.1 Impacts due to project operation:

The existing ambient air quality in the area has been described in Chapter-III. The enhanced mining and allied operations in this mining block may result in deterioration of air quality due to pollution arising from the project operation if prompt care is not taken. The principal sources of air pollution in the area due to mining and allied activities will be:

Dust generation in the mine due to:

- ❖ Extraction of overburden and limestone.
- ❖ Movement of HEMM such as shovels dumpers etc.
- ❖ Drilling and blasting operation
- ❖ Loading and unloading operation
- ❖ Overburden & ore conveying
- ❖ Wind erosion of dumps

Besides, Gas emission can occur as a result of operation of diesel driven mining equipments, compressors, transporting vehicles, etc.

Particulate matter smaller than 10 microns, referred to as PM₁₀, can settle in the bronchi and lungs and cause health problems like Bronchitis, Emphysema, Bronchial Asthma, Irritation of mucus membranes of eyes, etc. Particles smaller than 2.5 micrometers (PM_{2.5}), tend to

penetrate into the lungs and very small particles (< 100 nanometers) may pass through the lungs to affect other organs.

Besides, larger particles (greater than 10 microns in diameter) tend to settle to the ground by gravity in a matter of hours whereas the smallest particles (less than 1 micron) can stay in the atmosphere for weeks and are mostly removed by precipitation.

The following measures are being and will be adopted to control impact on the air quality in the MV Puram lease area:

a) Drilling:

- Usage of Drill bits of good condition
- Drilling with dust extractors, usage of sharp drill bits and use of water jet for dousing the cuttings(**Photo 4.3 A**)

b) Blasting:

- Well-designed blast by effective stemming and every blast is properly designed to see that the optimum breakage occurs without generating fines.
- Avoiding blasting during high wind periods where the fine dust is carried out away easily affecting the ambient air quality.
- Adopting controlled blasting techniques and using of Latest Blasting techniques like NONEL, Electronic System of Initiation system to maintain charge per hole and charge per delay as the same. By adopting such advanced practices in blasting we are controlling PPV well within the norms of 10 mm/sec.
- Avoiding blasting by using Primary Breaker wherever possible (**Photo 4.3 B**)

c) Excavation and hauling:

- Proper maintenance of HEMM which avoids excessive noise and vibration
- Acoustic enclosures for operator cabin.
- Imparting sufficient training to operators on safety and environmental parameters
- Proper maintenance of hauling equipment.

d) Transportation:

- Proper maintenance of haul road and other roads (**Photo 4.3 C**)
- Black topping of road wherever possible. In fact, Limestone from the mine to the cement plant is being transported through dedicated black top road of 37 kms length.
- Ore transportation by tarpaulin covered trucks (**Photo 4.3D**)
- Mobile water tankers have been deployed for fugitive dust suppression in haul roads and dumping sites. Water sprinkling through mobile tankers system at

permanent haul road.(Photo 4.3 E)

- Provision of afforestation, along inactive OB dumps.
- Development of green belt/ barriers around mine, along the roads, overburden dump etc. Already more than 10100 trees have been planted in the mine lease areas, office, dump site etc,

Due to adoption of all these measures, presently no major impact on air quality has been caused. This is amply corroborated from the evaluation of the latest values obtained from the environmental monitoring of air quality undertaken in the mine area and nearby villages which show that the values for all ambient air quality parameters are within statutory limits.

After enhancement, increase in limestone production to 0.5 million tonnes (0.726MTPA of ROM) will be achieved by improving the operating efficiency and increasing the size of the shovels and dumpers than its fleet. Due to above factors and continuation of various effective mitigative measures as explained earlier, there will be no major impact on air quality due to opencast mining enhancement and allied activities.

EXISTING MITIGATIVE MEASURES FOR AIR QUALITY

Photo – 4.3





Impact on air quality due to fugitive emissions consequent to this expansion project operation was estimated based on the latest computer model – **ISCST (Industrial Source Complex Short Term Model)**. Details of this modeling study / estimation including the modeling technique and post project air quality values are elaborated in the following paragraphs.

4.2.1.1 Air Pollution Modeling:

Air quality models are the primary tools for relating emissions to air quality impacts. Models, in turn, require acceptable input data for emissions, surface topography, meteorological parameters, receptor configurations, baseline air quality, and initial and boundary conditions for each modeling scenario. Since the quality and reliability of model outputs can never be any better than the inputs, quality control of the input data is important.

Prediction of impacts on air environment has been carried out using mathematical model based on a steady state Gaussian plume dispersion model designed for area sources for short term. In the present case, Industrial Source Complex [ISC3] 1993 dispersion model based on steady state Gaussian plume dispersion, designed for area sources for short term

and developed by United States Environmental Protection Agency [USEPA] has been used for simulations from point sources.

4.2.1.2 Pollutants Considered For Computation:

The model simulations are done for the air pollutant arising from the mining operations, namely, PM₁₀.

4.2.1.3 Emission Sources:

Pollution from the proposed project will arise mainly on account of mining and allied operations:

ACTIVITY	SOURCE TYPE
A. Excavation of waste and limestone	Open pit
B. Limestone and waste transportation	Line

EMISSION RATES

Quantification of particulate emissions has been carried out by the emission factor technique. Emission factor is a statistical average of the rate at which a pollutant is released during an activity. This factor when multiplied by the level of that activity in a given situation will give the overall effect. Fugitive emissions have been predicted by using standard equations given in “Indian Mine and Engineering Journal” and suggested by USEPA for mining & allied activities. The modelling is done for the entire production and not for the increase in production just to know the worst scenario.

Equations for various activities are:

<u>Activity</u>	<u>Equation</u>
A. Excavation of Waste & Limestone	23.6 kg/hr particulate matter for every 1000 Tonnes per hour material handling
B. Limestone & Waste transportation	0.2 kg/vehicle/km.
C. Drilling	0.6kg/hole
A. Excavation of Waste & Limestone	

Sl.no	Particulars	Existing (Million Tonnes)	After expansion (Million Tonnes)	Additional after expansion (Million Tonnes)
1	Waste & Ore	0.3	1.8	1.5

a) Core zone: Dust emission due to excavation

Dust emission: $Pa \times 23.6 / Wd \times Wh \times 1000$

Particulars of activity	Proposed levels
Production in TPA	1.5 Million Tonnes
Material excavated/tph** (300 days x 8hrs/day)	625 tons/hr
DUST EMISSION KG/HR DURING EXCAVATION	14.75kgs/hr 4.10 g/sec.

B. Ore & Waste transportation

Dust emission from the transport vehicles plying for the movement of Limestone & waste are estimated using the empirical value of 0.2 kg/vehicle/km.

$$DT = Tv \times 0.2 \times d$$

DT = Dust emission in kg/hr

Tv = No. of transport vehicles plying in one hour

Waste & Ore - 625 TPH

Dumpers

Waste & Limestone	-	30/ 40 T Dumpers
Lead	-	2.0 km
Maximum no of Trips per hour	-	17
Dust emission due to transport:	-	3.40 kg/hr or 0.94 g/sec.

C. Drilling:

Maximum no of holes per day	-	10
Dust emission due to drilling	-	6.00 kg/day or 0.21 g/sec.

The above mentioned emission rates are uncontrolled emissions. Due to installation and operation of dust control measures at mining site, emission sources at different elevations, the emissions will be far less than the established emissions.

The emission rates and conditions have been summarized below.

EMISSION RATE AND EMISSION SOURCES

Dust Emission Rate		
A. Due to excavation		4.10 g/sec
B. Due to transport	=	0.94g/sec
C. Due to drilling	=	0.21 g/sec
Size of the pit	=	750m X 250m

4.2.1.4 Emission Source Coordinates:

The center of mine was assumed (0, 0) in the mathematical modeling.

4.2.1.5 Mathematical Model for Pollutants Dispersion:

In the present case ISCST (Industrial Source Complex-Short Term ISC-3) model has been used to predict the impacts. This ISC model for area sources uses the steady state Gaussian plume equation for a continuous source.

Further the model has following specialties:

- Simulates dispersion from single/multiple/area/line/volume sources.

- Allows calculations to be made at a user specified regular rectangular/radial grid or at specified special receptors.
- Provides estimates of concentrations for any averaging time period for the entire period of input meteorology.
- Allows calculations to be underwritten for source groups as selected by the user.
- Uses Pasquill-Gifford or Briggs dispersion curves (for urban areas) as selected by the user, to derive the plume spread parameters.
- Adjusts dispersion curves to account for user specified information on aerodynamic roughness.
- Adjusts for wind speed variation with height, using user specified default urban/rural power law coefficients.
- Simulates dispersion from buoyant, non-buoyant point sources, non-buoyant area, non-buoyant volume sources and non-buoyant line sources.
- Simulates dry deposition using a simple tilted plume model with user specified reflection coefficients.
- Simulates building wake effects.
- Can include the effects of exponential decay.
- Uses Briggs' 1975 plume rise algorithm to calculate plume height.

4.2.1.6 Meteorological Conditions used in Predictions:

The hourly meteorological data has been generated at the site for winter season (Dec 2013 – Feb 2014) and the same has been used in the predictions.

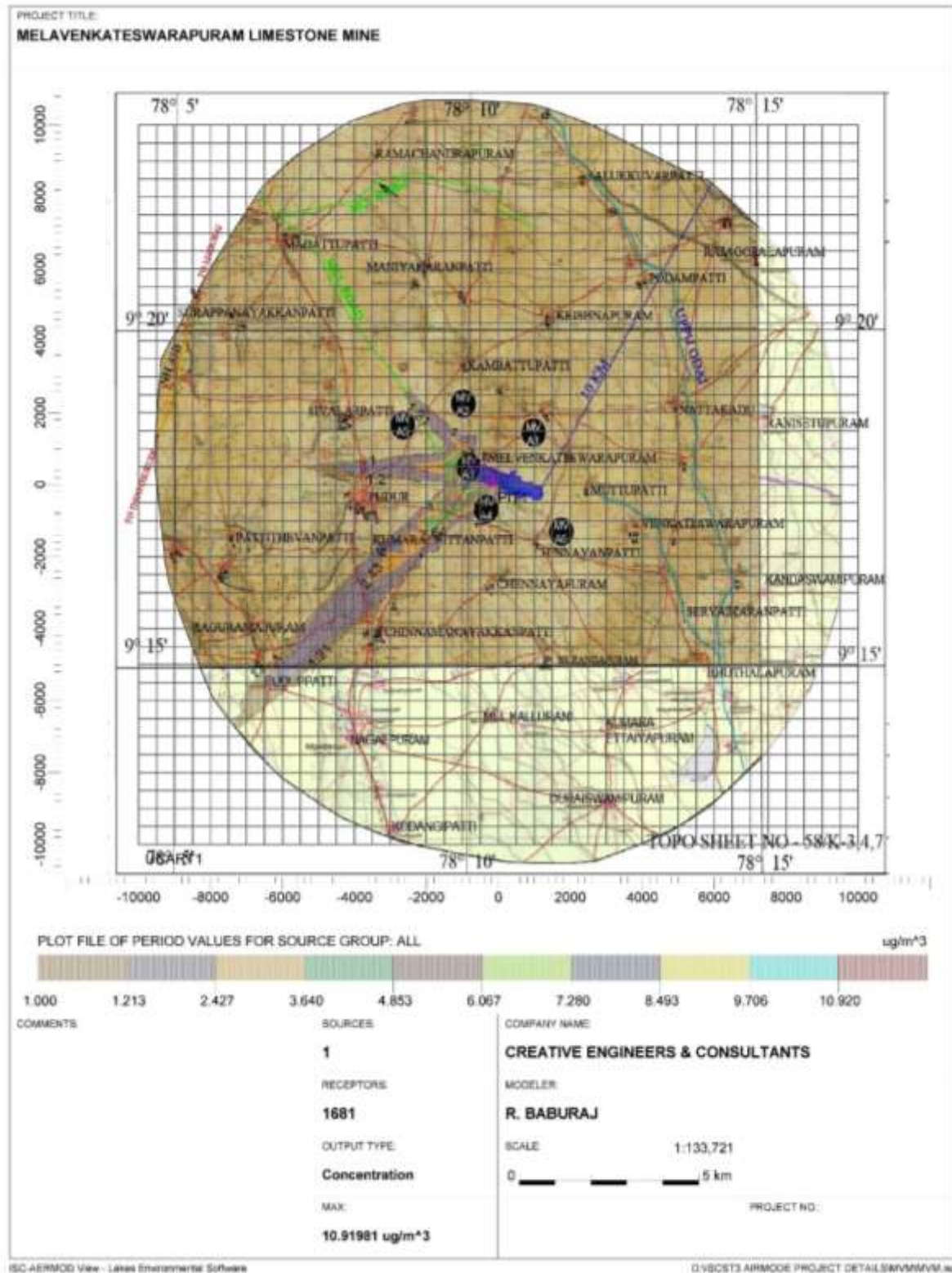
4.2.1.7 Results and Discussions:

Peak hourly incremental concentrations have been computed using hourly meteorological data and from the study it is observed that the peak incremental 24 hourly PM concentration under worst scenario works out to **10.91 $\mu\text{g}/\text{m}^3$** which is occurring very near the source. However at away from the source the values are getting reduced.

The Isopleths of various concentrations have also been drawn and these are given in **Figure No – 4.1**. The incremental and predicted concentrations at the locations of ambient air quality have been discussed in the following section.

Isopleth of GLC Prediction for PM₁₀

Figure No – 4.1



4.2.1.8 Predicted Ambient Air Quality:

With a wide fluctuation in meteorological parameters it is a complex task to predict post project ambient air quality. The cumulative Ground Level Concentration of (GLC) (base line + incremental) under worst scenario is given in Table **No 4.1**.

Concentrations of PM₁₀ after Project implementation

Table No-4.1

S. NO	LOCATION	BACKGROUND CONCENTRATION OF PM₁₀ (µg/m³)	PREDICTED INCREMENTAL CONCENTRATION OF PM₁₀(µg/m³)	POST PROJECT CONCENTRATION (µg/m³)
1	MINE LEASE AREA MV PURAM	86.6	2.4	89.0
2	KAMBATTU PATTI	68.2	<1.0	69.2
3	MELVENKATESWARAPURAM	69.2	<1.0	70.2
4	PUDUR	72.3	1.0	73.3
5	SIVALARPATTI	76.2	<1.0	77.2
6	MUTHUPATTI	61.3	<1.0	61.3

It can be seen that the resultant added concentrations with baseline figures even at worst scenario, show values of ambient air quality in the range of 61.3µg/m³ to 89.0 µg/m³ which are within the NAAQ limits. For preservation of environment in this mine as well as the other working mines, strict enforcement of management schemes and regular air quality monitoring will be undertaken for taking corrective actions, as needed. By continuing the effective implementation of all the mitigative measures no adverse impact on Air quality is expected.

4.3.0 WATER ENVIRONMENT:

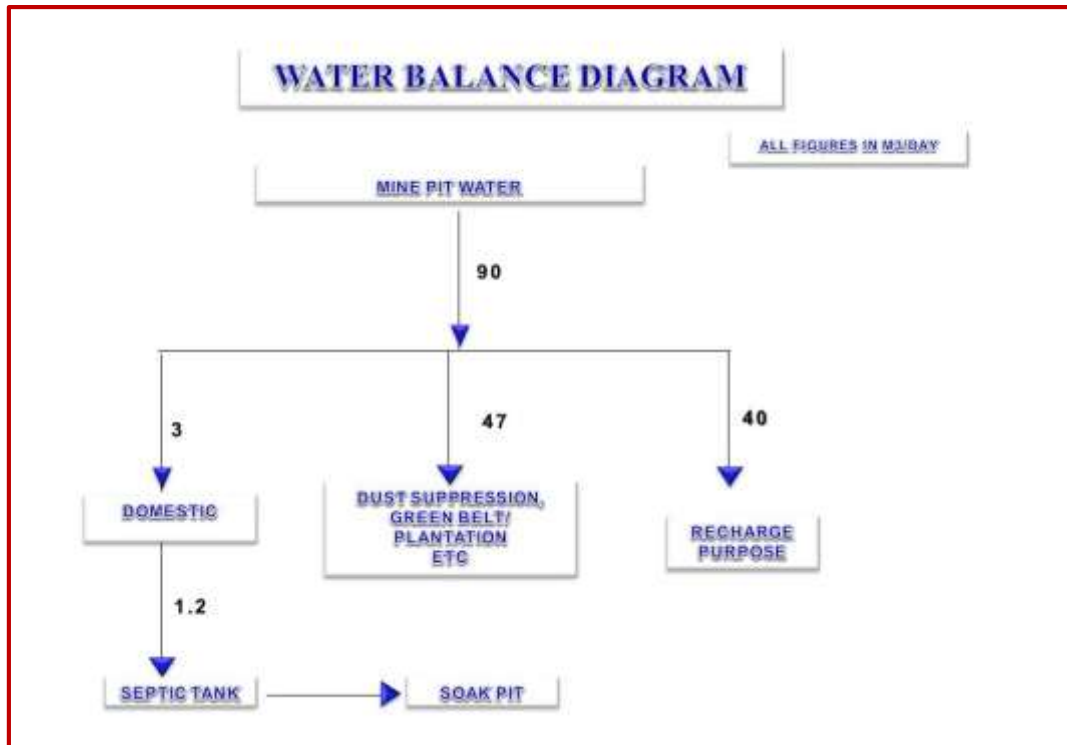
The total seepage water generation from the mine pit is 90 m³/day out of which the maximum water requirement for the Melavenkateswarapuram limestone mines after expansion is 50 m³/day with the following breakup:

- For domestic sanitary needs - 3.0 m³/day
- For dust suppression and green belt development etc - 47.0 m³/day
- Total water requirement - **50.0 m³/day**
- Recharge purpose - 40.0 m³/day
- Total availability (seepage water) - 90.0 m³/day**

The exhausted Mine Pit between ML - 1 and ML – 4 in Pandalgudi Mines at distance - 8.9 km (NW) is kept as a reservoir and is being utilized for other captive mines also. TRCL has

established water treatment plant in Pandalgudi to treat the mine water for drinking purposes for both colony and other mines work sites. (Figure No – 4.2)

Figure No – 4-2



4.3.1 Sources of Water Pollution:

The existing water environment showing water quality at different sampling stations in the area has been described in Chapter-III.

Direct impact on human beings due to poor water quality consequent to mining operation can lead to various water borne diseases like diarrhea, jaundice, dysentery, typhoid, etc. Besides, the polluted water may not be useful for animal or human consumption, vegetation and may affect aquatic life, if effluents are not properly treated to remove the harmful pollutants.

The major sources of water pollution normally associated due to mining and allied operations are:

- Generation of industrial effluent water from workshop, service building.
- Disturbance to drainage course in the project area.
- Domestic effluent.
- Washouts from waste dump.
- Mine discharge water pumped out from opencast mines.
- Effect on ground water table.

The treatment schemes of each of the above source of water pollution are given below:

A. WORK SHOP EFFLUENT:

This being a mining project, there are no process effluent. Common workshop at Pandalgudi is used for this mine also and as such there will not be any workshop effluent from this lease area.

B. DISTURBANCE TO DRAINAGE COURSE IN THE PROJECT AREA:

There are no drainage courses near the mine lease and as such no impact on the surface water courses envisaged.

C. DOMESTIC EFFLUENT.

Domestic effluent is mainly sewage only. Septic tank with soak pit arrangement is provided at the mine site.

D. WASHOUTS FROM WASTE DUMPS, STOCKPILES:

The impact on water quality from this mining operation is mainly expected due to wash out of waste dumps during monsoon which may carry silt and contaminating nearby agricultural lands on the southern side and pumping of water from the mines.

The following mitigative measures are being implemented in the inactive waste dumps and these remedial steps will be enforced rigorously in future also to control the post-expansion water environment in the area, by making improvements appropriately.

- Providing dump tops with inner slopes and through a system of drains and channels, water will be allowed to descent into surrounding drains, so as to minimize the effects of erosion arising out of uncontrolled descent of water.
- The dump tops and sides of inactive areas will be progressively reclaimed with grasses and shrubs like Agave, Nuna, grasses to arrest and prevent erosion.
- Construction of garland drains of suitable size around mine area and external dump with proper gradients to prevent rain water descent into active mine area. Garland drains & sedimentation ponds have been made already to arrest siltation and channelizing storm runoff water. 3 garland drains, two along dump bottoms and one along lease boundary have been made which measure 1.2 km x 2m x 2m in all three cases.
- The material removed from the drain is dumped on the periphery and an earthen embankment / retaining wall is made to prevent any runoff or wash off from the dump reaching the nearby private lands.

- The garland drains are connected to two settling tanks of sizes 90m x 50m x 3.0 m and 60m x 40m x 3.0 m are created in lease area to collect surface runoff and mine water.
- One settling / recharge pond proposed to be constructed with the size of 100m x 40m x 2.5 m after expansion
- A safety distance of 10m will be left from the nearby private land on the western side and the toe of the dump and this area will be planted with local native species.
- It is proposed to leave a 50m barrier on the South western side from the dump toe to a small tank located just outside the lease. This area can also be planted with native trees.
- The surface run off management details are shown in **Figure no-4.3 & Photos 4.4 A-D.**

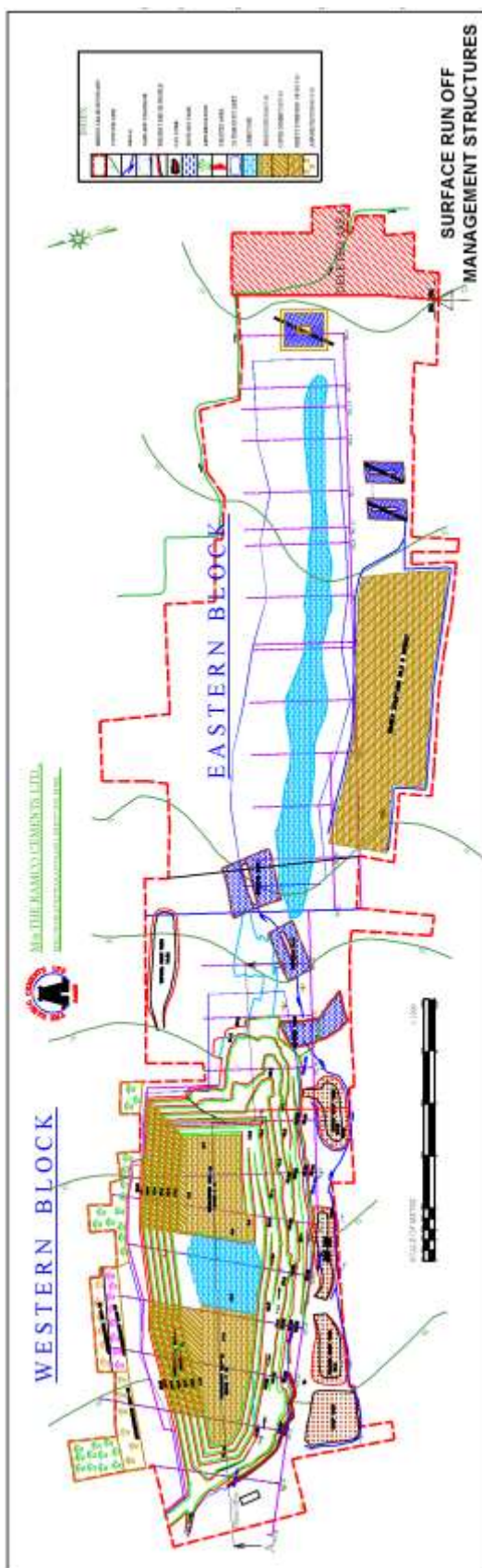
Presently there is some seepage of water into the mine. The seepage water is being collected in the existing sump at the floor of the mine of adequate dimension considering the monsoon rainfall and the seepage quantity for other season. Water flowing during monsoon or regular seepage if any will be diverted to this mine pit sump by maintaining proper gradient on the bench floors and construction of water drains at the bench periphery.

Mine sump water conforming to discharging standards can be directly used for dust suppression on roads, in the green belt areas, domestic needs etc. Besides, water meant for drinking/human consumption is being supplied from centralized mines office.

In view of the above, it can be stated that the impact on water environment are insignificant. This is corroborated by the fact that inspite of more than 3 decades of mining operations no siltation or allied problems on water environment has been observed so far.

SURFACE RUN OFF MANAGEMENT

Figure no – 4.3



SURFACE RUNOFF STRUCTURES

Photo 4.4





WATER FROM GARI AND DRAIN TO SETTLING POND



SETTLING POND



DUMP TOP PLANTATION

4.3.2 Impact of Mining on Ground Water:

The rainfall is the major source of ground water recharge in the study area / buffer zone. Estimation of ground water resources and stage of development in the buffer zone as per GEC norms show that Pudur Block of Vilathikulam taluk of Thoothukudi where the mines area Melavenkateswarapuram, Pudur, Nadukattur and Sennayampatti villages, the stage of ground water development in the year 2012 has been categorised by CGWB as **Safe Block**. The total annual replenishable Recharge (Mm³ / year) is assessed by the following two methods.

I. BY GROUND WATER FLUCTUATION METHOD

Water table fluctuation (H)	=	5 m
Specific Yield for Limestone as per GEC Norm	=	1.5 %
10 Sq .km from around mines Buffer zone	=	31400 HA
Area (Ha) x Water level fluctuation (m) x Specific yield (%)		
31400 x 5 x 1.5 %	=	2355 ha-m
say	=	23.55 Mm ³

II. BY RAINFALL INFILTRATION / RECHARGE METHOD

Buffer Zone area	=	31400 ha
Rainfall /year	=	460mm
(Aruppukottai R.G. Station for 50 years)		
Infiltration Factor	=	10%
Area (Ha) x Rainfall (m) x Infiltration Factor (%)		
31400 x 0.460 x 10 %	=	1445 ha-m
Say	=	14.45 Mm ³
Average of I & II	=	(23.55+14.45)/2
		19 Mm ³

III. RECHARGE FROM SURFACE SOURCES

III) Recharge through seepage from water bodies (Tanks/Kere)

Water Spread area of the tanks in the project area : 2905 Ha (2.9 Sq. km)

The seepage from the tanks for total water spread

Area – GEC Norms	:	44 to 60 cm per year
	:	50cm, taken for the project area
	:	290 Ha X 0.5 m = 145 Ha-m

Recharge through seepage from the surface

Storage Factor	:	145 Ha-m
----------------	---	----------

$$\text{Total Recharge} = (I + II / 2) + III = 1900 + 145 = 2045 \text{ Ha-m} \\ = 20.45 \text{ Mm}^3$$

IV. ANNUAL GROUND WATER DRAFT

- a) Total number of Dug wells /borewell used = 864
b) Unit draft/year = 0.4 ha-m
Gross yearly draft Through wells = 864×0.4
= 345.6 or 346 ham

GROUND WATER DRAFT BY POPULATION

- Population of the area = Say 65000
Water consumption per capita per day = 100 litres
Total consumption = $65000 \times 100 \times 365 / 1000 / 10000$
= 237.25 ham
say = 240 ham or 2.4 Mm³

V. DEWATERING OF MINE WATER (AVERAGE DAILY MINE WATER)

From the evaluation and study of the pumping pattern of the M. V. Puram mine pit water it is observed that about 90 Cu.m of water is seepage Ground water.

From other mines combinedly around 200 Cu.m/day of Groundwater is pumped.

Thus the annual quantity that will be committed during mining will be

$$= 90 + 200 \times 365 \text{ days} \\ = 10.60 \text{ ham}$$

$$\text{Net annual Draft} = 346 + 240 + 10.60 \\ = 596.6 \text{ ham or } 5.96 \text{ Mm}^3$$

VI. GROUND WATER BALANCE

$$\text{Groundwater balance} = \text{Net annual recharge available for} \\ (\text{Development} - \text{Net annual Draft}) \\ = 20.45 - 5.96 \\ = 14.49 \text{ Mm}^3$$

VII. CATEGORY OF AREA

- a) Present stage of groundwater Development = Net annual draft / Net annual Recharge X 100

$$= 5.96 / 20.45 \times 100$$

$$= 29.14\%$$

Say = 30%

b) Stage of development at year 5 (as on) 2014

Yearly rate of ground water development (%) = 0.6

Stage of development at Year 5 (as on)2014 = Present stage + (5 x yearly rate)

$$= 30 + (5 \times 0.6)$$

$$= 33\%$$

CATEGORY OF AREA = SAFE

4.3.3.EFFECT OF MINING ON WATER ENVIRONMENT:

Continuous survey, study and monitoring of the seepage zones inside the mine pit and the volume of seepages, show that around 70 to 80m³/day of groundwater from the joint planes at the intersection of limestone beds with granitic rocks, together with another 10 to 20m³/day from the exposed mine faces, flow down in to the mine pit floor.

The above integrated study together with a review of pumping details of evacuation of water from the mine pit indicates availability of around 90m³/day for different uses.

Even though some seepage of water from the joint planes are observed in the mine pit, it is localized insitu seepages as limestone is having low permeability and hydraulic conductivity, hence there is no effect on the nearby irrigation wells. *This levels very clearly indicates that there is no hydraulic continuity between the limestone and to the country rocks in the adjoining core and buffer zone areas* & this is due to the fact that the limestone is an intrusive body and acts as a ground water barrier which arrests the occurrence movement and distribution of the groundwater either from the limestone to country rock or vice versa.

However, the above availability does not take into account the rain water falling directly in to the mines. The quantity from this source depends mainly on the intensity of rainfall and the open surface area of exposure of the mine.

The Melavenkateswarapuram mine site experiences an annual average rainfall of about 460mm (Source: Rain gauge at mine site in 7 year period 2008 – 2014), out of which, nearly 63% occurs during the north-east monsoon period of October to December.

However, the actual quantum of evacuation of the rainfall collection component inside the mine pit is also regulated according to the pondage area that can be provided, mining status & advance and also maintaining near uniform rate of pumping for ensuring optimum availability even in summer months.

The study and evaluation of the pumping details over the period 2012 – 2014 indicate a rainwater component pumping rate of 80 to 120m³/day during January to May, mostly 60 to 80m³/day for the period June to September and 250 to 390 m³/day for the north-east monsoon period of October to December.

Hence, this periodical and seasonal availability of rainwater together with more or less consistent availability of seepage groundwater is pumped out in to two percolation/recharge ponds constructed on the eastern side of the mine area.

One more pond is proposed at the south eastern corner of the lease area. If one is filled up, the surplus will over flow in to the next pond. These ponds are connected in series. This will be the points of recharge to the aquifers.

4.3.4 Rainwater Harvesting:

Rainwater harvesting is already being done by collecting all garland drain out flows and mine water in settling tanks as stated above. The settling tanks are desilted frequently and neutralized if need. Besides, TRCL is maintaining a mined out void in Pandalgudi lease as a good rainwater harvesting reservoir. This pond caters the needs of the entire TRCL mines, cement plant and colony potable water requirements. Besides, roof top harvesting measures in the colony, administrative buildings are also created.

Two numbers of storage cum percolation / recharge ponds are already constructed on the eastern side of the mine area. One more pond is proposed at the south-eastern corner of the lease area. If one is filled up, the surplus will over flow to the second pond. These ponds are connected in series.

Pond	Size in metres	Volume in m³
Pond – 1	100 X 40 X 2.5	10,000
Pond – 2	125 X 50 X 2.5	15,625
Pond – 3 [Proposed]	100 X 40 X 2.5	10,000
Total		35,625

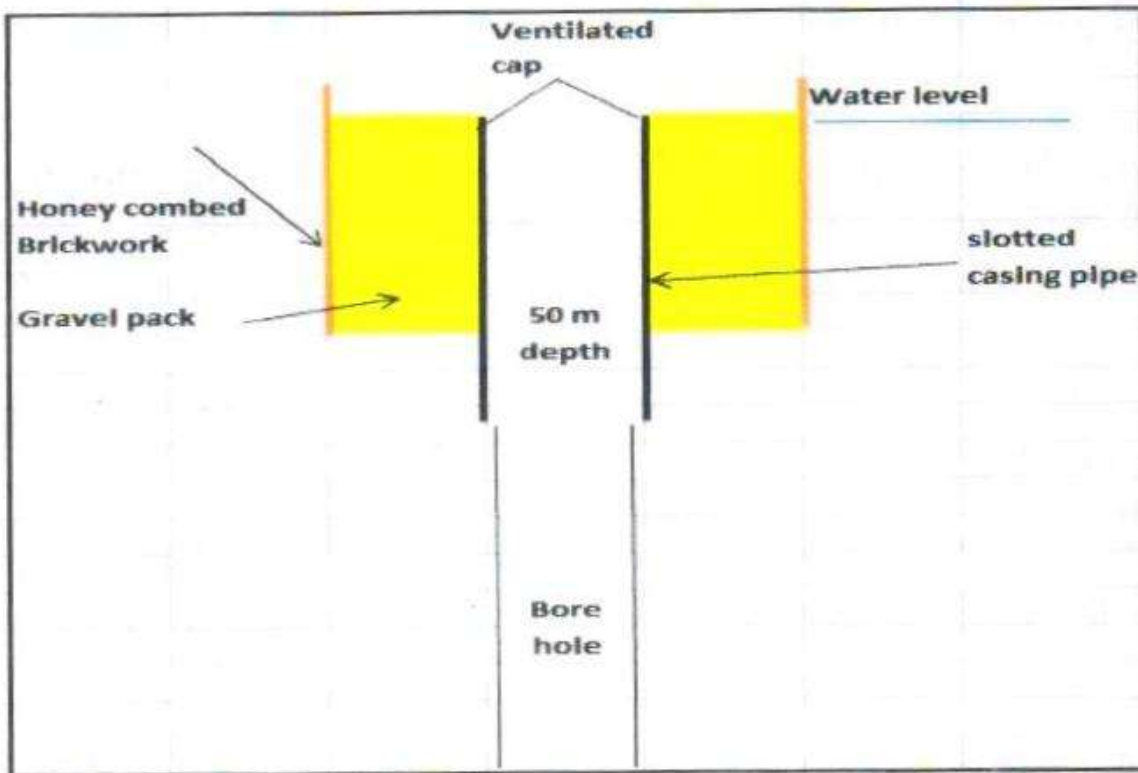
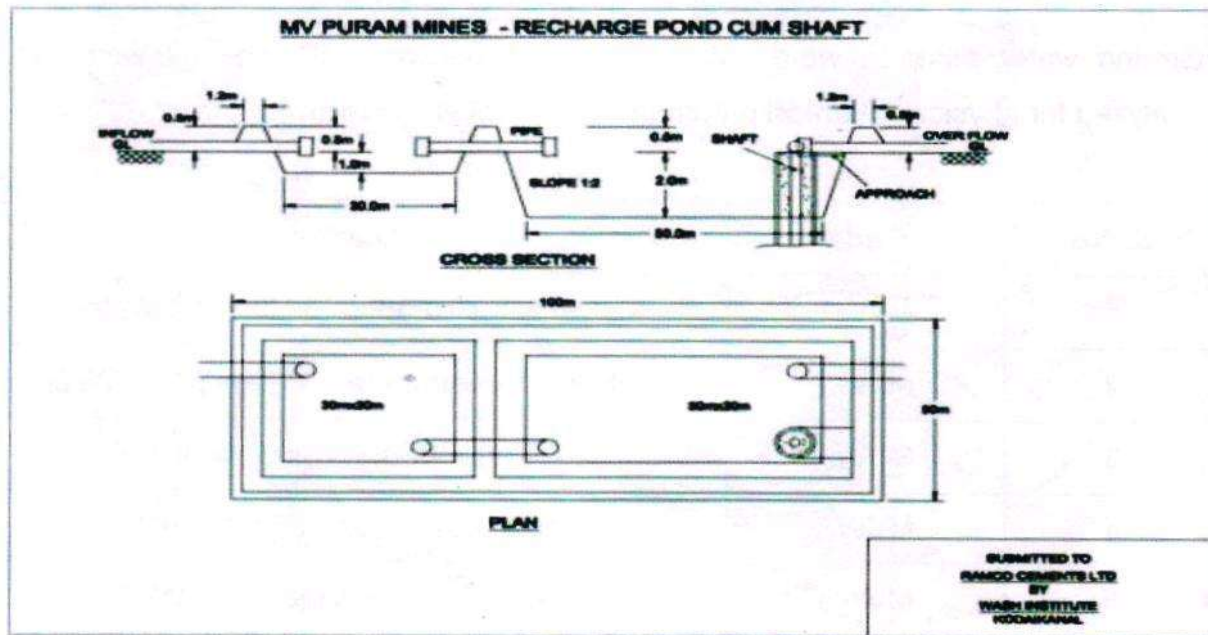
Schematic sketch of the proposed recharge pond cum shaft is given in **Figure No 4.4.**

It is proposed to construct to two recharge bore wells inside pond 1 & 2 to facilitate downward percolation of water.

In addition to the above, the desilting and cleaning of feeding channel of Melavenkateswarapuram village ponds / Oorannies is facilitated under Ramco Social Service scheme. This helps to prolong water availability for public use.

Figure No.4.4

SCHEMATIC SKETCH OF THE PROPOSED RECHARGE POND CUM SHAFT



4.4 NOISE & VIBRATION LEVELS:

4.4.1 Noise Environment:

The ambient noise levels in the study area have been discussed in Chapter-III. The data shows the existing noise levels are within statutory limits. The impact prediction and control measure for noise environment due to mining and allied activities is described below:

4.4.1.1 Impact prediction due to noise:

Noise is one of the inevitable causes of pollution in mining operations, largely due to the extensive mechanization adopted. Besides, other operations such as, drilling, blasting, movement of vehicles, etc. also produce noise of considerable magnitude in mining operations. The main sources of noise and expected levels are given below in **Table No – 4.2:**

Main Sources of Noise

Table No – 4.2

Sl. No.	Source	Inside Cabin	Noise level at dB(A) 10 m. from source
1	Shovel	84-91	59-68
2.	Dumpers/Tippers	87-96	75-85
3.	Water truck	82-92	74-82

Prolonged exposure to a high noise level is harmful to the human auditory system and can create mental fatigue, rebellious attitude, annoyance and carelessness, which may lead to neglect of work and also result in accidents.

The impact of noise level as per World Health Organization's 1986 notification is given below in **Table No-4.3:**

IMPACT OF NOISE LEVELS

Table No-4.3

NOISE LEVELS	ADVERSE EFFECTS
20-50 dB(A)	Speech impairment and annoyance
50-90 dB(A)	Hearing impairment for eight hour exposures
90-115 dB(A)	Partial deafness and nervous irritability
> 115 dB(A)	Permanent deafness
Impulsive noise (>90dB)	Frightens livestock grazing in the nearby areas

OSHA (Occupational Safety and Health Administration), USA and other similar organisations stipulate that noise level up to 90 dBA is acceptable for eight hours exposure Leq (Equivalent sound level) (8hrs) per day.

The Directorate General of Mines Safety, in circular No. DG (Tech)/18 of 1975, has prescribed the noise level in mining occupations (TLV) for workers, in an 8 hour shift period with unprotected ear as 90 dBA or less.

However, the noise will be felt only near the active sources. There will be considerable reduction in the noise level due to the absorption factor, environmental surroundings and other attenuation factors. As far as absorption factor is concerned, If the ground cover is vegetated or has a soft texture, sound will decrease at the rate of 4.5dB(A) every time the distance between the source and the observer is doubled. Besides, there will be shielding factor, which takes into account the environmental surroundings. With every 30m of dense land scape vegetation, 5dB(A) of additional attenuation can be obtained upto a maximum of 10 dB(A). As such at away places the effect of noise will not be felt.

4.4.1.2 Control measures for noise environment:

As already mentioned, open cast mining activity in this block is in place for the last so many years. In the present mine workings, periodical monitoring of noise level in the mine and the nearby areas are being done and reported to statutory authorities. All the observed values show that the values are well within statutory limits.

Hence, by continuing the following mitigative measures already being adopted for noise control, the impact on noise levels will continue to be insignificant:

1. Planting rows of native trees along roads, around mine area and other noise generating centers to act as acoustic barriers.
2. Sound proof operator's cabin for equipments like dumpers, shovel, tippers, etc.
3. Proper and regular maintenance of equipments may lead to less noise generation.
4. Providing in-built mechanism for reducing sound emissions.
5. Providing earmuffs to workers exposed to higher noise level.
6. Conducting regular health check-up of workers including Audiometry test for the workers engaged in noise prone area.
7. Displaying the noise level status of operational machinery on the machines to know the extent of noise level and to control the time to which the worker is exposed to higher noise levels.
8. Noise levels from blasting are reduced due to Latest Blasting techniques like

NONEL, Electronic System of Initiation system to maintain charge per hole and charge per delay as the same. By adopting such advanced practices in blasting we are controlling PPV well within the norms of 10 mm/sec.

9. Avenue plantations already exist along haul roads and along peripheral portions of the mining lease areas. Further green belt and afforestation will be planned and executed in future to abate noise and dust propagation in the area.

4.4.2 Impacts due to ground vibrational effects due to blasting:

The vibration due to blasting can cause damage to the nearby structures if appropriate technology and control measures are not adopted in the blasting operation. Fly rock is another possible damage causing outcome of blasting. There are many factors which influence fly rock during blasting. Most important of these factors are long explosive column with little stemming column, improper burden, loose material or pebbles near the holes and long water column in the hole.

In the present mine workings, blasting & vibration effects are well controlled by following measures.

- a) Optimum design for burden and spacing.
- b) Inclined drilling practice, whenever necessary.
- c) Reducing explosive charge to minimum.
- d) Proper deck charging practices, looking to consolidation and hardness of strata conditions.
- e) Using ordinary electric milli second delay detonators, in combination with \ denoting fuse etc. This sequence of blasting reduces vibration to a large extent, thereby minimizing propagation of shock waves.

Blasting in Melavenkateswarapuram Limestone is practiced using the Latest Blasting techniques like NONEL, Electronic System of Initiation system to maintain charge per hole and charge per delay as the same. By adopting such advanced practices in blasting we are controlling PPV well within the norms of 10 mm/sec. This system forms a part of Controlled Blasting system wherein the amount of Explosives blasted in a fraction of time is controlled by introduction of delay timings between the holes so as to reduce the ground vibrations induced due to blasting. The Firing sequence of the blast hole column is also designed to be Bottom to top so that the blasted rock immediately falls down due to gravity and has no Fly rock. Slurry explosives or Emulsion explosives in combination with Ammonium Nitrate Fuel oil explosives are used for charging the Explosive column.

The usage of Shock Tube detonators for initiation provides for Bottom Initiation of the Hole thereby reducing the Fly rock, minimal ground vibration and increased safety.

Advantages:

1. Perfect bottom initiation which controls the fly rock.
2. Accurate timing to keep the initiation sequence precisely and helps to control blast induced vibration.
3. Helps to maintain precise blast mass heaps and quality control of the blast material.

The Management has conducted scientific studies through the Department of Mining Engineering, College of Engineering, Guindy, Anna University to study the influence of Blast Induced Ground vibrations of the Melavenkateswarapuram Limestone Mines on the residential and other buildings of the Neighboring villages in December 2012. The study revealed that the ground vibrations generated by the method of controlled Blasting practiced in the mines were well within the permissible levels and hence is not affecting the structures in the neighboring villages. Precautionary measures against Fly rock, Ground Vibrations & Noise are strictly taken care during blasting operations. The Blasting operations are placed under the direct supervision of the Mines Manager who is a qualified Mining Engineer & possesses Mine Manager's First class certificate of competency issued by Directorate General of Mines safety, Govt Of India and is assisted by adequate statutorily qualified personnel.

The permissible peak particle velocity (PPV) in ground vibration are shown in following table, as per circulars from DGMS in this respect.

**Permissible peak particle velocity (mm/s) as per DGMS (Tech)(S&T) Circular No. 7 dated
29/8/1997**

Type of structure	Dominant excitation frequency, Hz		
	<8 Hz	8-25 Hz	>25 Hz
A. Buildings/structures not belonging to the owner			
Domestic houses /structures (Kuchha brick and	5	10	15
Industrial buildings (RCC and framed structures)	10	20	25
Objects of historical importance and sensitive	2	5	10
B. Building belonging to owner with limited span of life			
Domestic houses/structures (Kuchha brick and	10	15	25
Industrial buildings (RCC and framed structures)	15	25	50

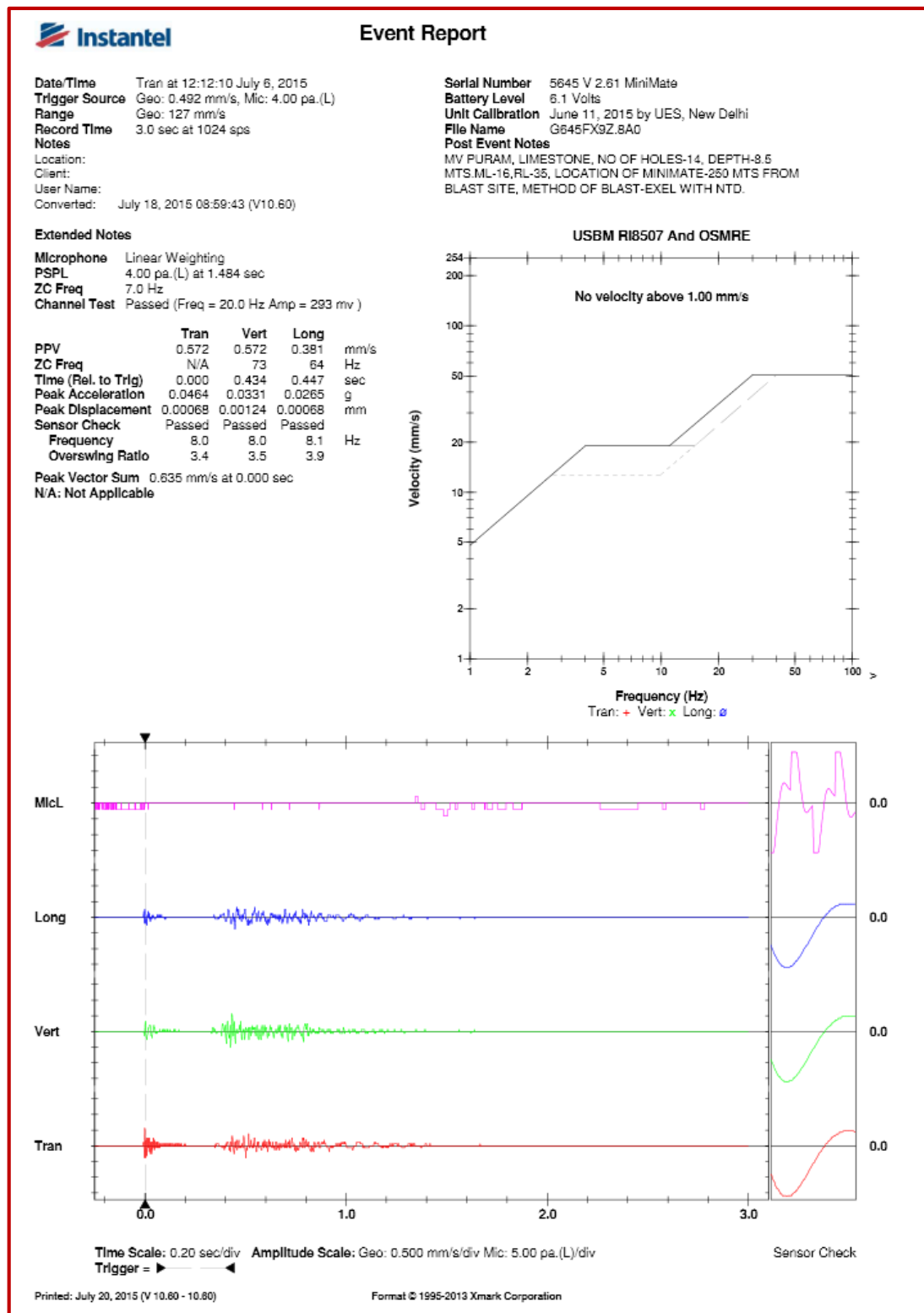
Periodical Ground vibrational studies conducted by TRCL (**Refer Photo No. 4.5**) with Mine mate in this mining site shows that the PPV levels at 250m distance is in the range of 0.635mm / sec for Limestone (**Refer Figure no 4.5A**) and for Development the PPV levels at 300m distance is in the range of 0.794 mm / sec which are generally found to be within limits (**Refer Figure no 4.5 B**)



Photo 4.5 BLASTING VIBRATION MEASUREMENT

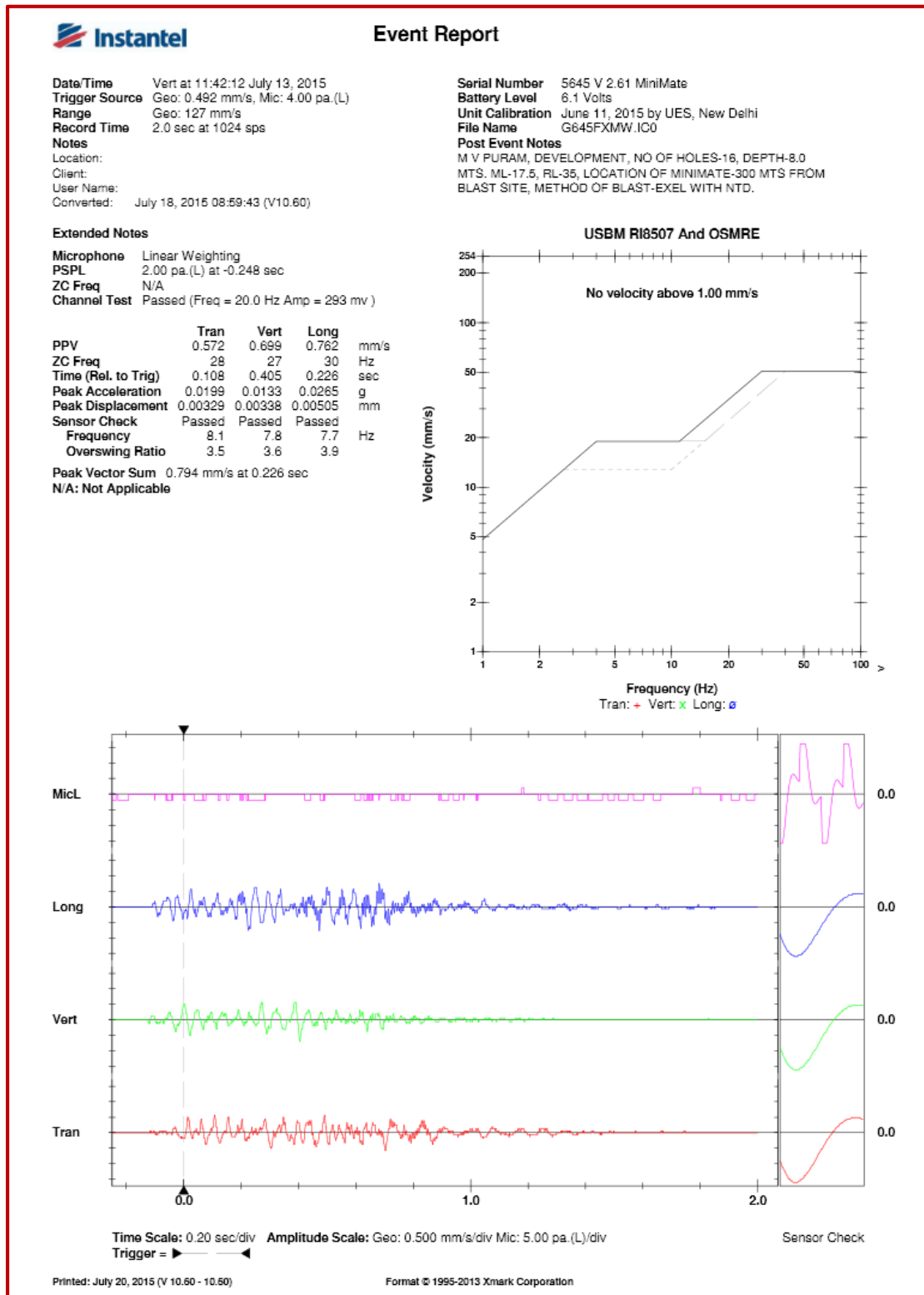
RESULT OF THE BLAST MONITORING REPORT

Figure No. 4.5A



RESULT OF THE BLAST MONITORING REPORT

Figure No. 4.5B



4.5 IMPACT ON LAND ENVIRONMENT:

Out of 98.62 Ha of mine lease area about 97.825 ha of land are private land and the remaining 0.795 Ha are Government land. TRCL is having lease and in possession of the entire lands. There are no forest land in the core zone and no forest land certificate is obtained from DFO, Tamil Nadu Forest Department and given as **Annexure – 16**.

The lease area consists of only bushes at pre-mining stage. Due to mining operations land status changes on account of below stated reasons:

1. Overburden / waste extraction to reach the Limestone.
2. Dumping of overburden / waste in the initial period as well as limestone.
3. Construction of infrastructure facilities such as, office, road etc.

Presently mining operations are carried out in the western block only. About 20.35 Ha & 2.95 Ha are covered under mining & dumping respectively. This is likely to go up to 24.97 Ha & 10.33 Ha under mining & dumping respectively at the end of present Mine Scheme period.

In the ultimate stage about 41.72 Ha of land area will be covered under mining and 16.72 Ha will be under dumps. Besides, 14.13 Ha of land area will be covered under green belt / plantation.

To minimize land degradation, it is proposed to work only one pit at a time. After exhaustion of western block which is worked presently, the eastern block between ML 11 and ML 0 will be taken up for mining. Entire waste removed from eastern block will be used for filling of part of mined out western block.

Out of 41.72 Ha of mined out area an extent of 3.897 Ha will be refilled, about 5.95 ha will be left as water reservoir and the remaining area of 31.87 Ha will have bench plantation.

4.5.1 Land use pattern:

The mine lease area of 98.62 Ha is mostly dry waste private patta land /Government land owned/leased to The Ramco Cements Limited. There is no major vegetation except for some thorny bushes.

Out of 98.62 Ha of mine lease area 79.12 Ha will be utilized and the rest will remain untouched.

SI No	Head	At Present	End of 5th year	Life of the mine
		(Area in Ha)	(Area in Ha)	(Area in Ha)
1	Area of excavation	20.35	24.97	41.72
2	Storage of top soil	1.03	3.70	3.70
3	Overburden/dump	2.95	10.33	16.72
4	Mineral Storage	-	Nil	Nil
5	Infrastructure(Workshop / Building)	0.05	0.05	0.05
6	Roads	0.20	0.20	0.20
7	Railways	-	Nil	Nil
8	Green belt / Afforestation	2.90	4.30	14.13
9	Tailing pond	-	Nil	Nil
10	Effluent treatment plant	-	Nil	Nil
11	Mineral Separation plant	-	Nil	Nil
12	Town ship area	-	Nil	Nil
13	Others	2.20	2.40	2.60
	Total	29.68	45.95	79.12
	Unused land	68.94	52.67	19.5
	Grand Total	98.62	98.62	98.62

Out of 41.72 Ha of mined out area an extent of 3.897 Ha will be refilled, about 5.95 ha will be left as water reservoir and the remaining area of 31.87 Ha will have bench plantation. Besides, 16.72 Ha of Dump area & Topsoil storage area of 3.70 Ha will also be covered with plantation. The land use post operational period is given below:

Land Use during Post Operational Period

S. No	Description	Land use (Ha.)				
		Plantation	Water body	Public use	Undisturbed/ Unused area	Total
1.	Mine Area	35.77	5.95	-	-	41.72
2.	Overburden / Dumps	16.72	-	-	-	16.72
3.	Roads	-	-	0.20	-	0.20
4.	Infrastructure	-	-	0.05	-	0.05
5.	Green Belt/Plantation	14.13				14.13
6.	Other (Specify) /Topsoil storage	3.70			2.60	6.30
7.	Unused area				19.5	19.5
	TOTAL	70.32	5.95	0.25	22.1	98.62

The mine closure plan and cross section is shown as **Figure No. 4.6**.

MINE CLOSURE PLAN

Figure No – 4.6



4.5.2 Disposal of waste and land reclamation:

a) Top Soil

There is no likely hood of generation of top soil during scheme period as working will be carried out only in the already opened up pit.

Topsoil to be generated in future will be stacked separately and utilized for future reclamation purposes.

b) Waste Disposal and reclamation of backfilled areas:

Presently 5 dumps are located within the ML area and its details are:

Dump No	Dump	W	L	Height (m)	RL (m)
Dump - 1	Dump yard	98	91	10	69.0
Dump - 2	B.C. Soil dump	118	61	10.5	68.5
Dump - 3	Dump yard	142	43	15.5	73.5
Dump - 4	Reject dump	131	56	12.5	69.5
Dump - 5	Top soil dump	196	53	19.0	75.0

Location of the existing dumps are shown in **Figure 4.3**

The dumps presently located are well within the lease area and also proposed dumping is also within the Mining Lease area. No material will be dumped outside the lease area and so far all the reject generated as well as top soil generated were dumped in separate dumps located inside the lease only.

Presently, there are 5 no of dumps located within the lease area. The height of present dump yards is 10 to 20 meters. If necessary, the height of the dump yards will be increased to a maximum of 30 meters.

In future, It is estimated that around 18.19 million tonnes of side burden waste and interstitial reject will be generate till the life of the mine in both the blocks. Out of the above, 9.71 million tonnes of developmental waste will be generated from west block, of which about 8.25 Mil.T will be dumped in the proposed dump on the Southern side of eastern block along ML – 4.5 to ML – 10 and the rest 1.46 Mil.T will be utilised for road and bund making along mine periphery. The rest 8.47 Mil.T of development waste from Eastern block will be utilized for refilling the worked out pit between ML 12.40 to 15.00 (western pit) upto the surface after exhausting all the reserves in the western pit area. The total area reclaimed by refilling will be 3.897 Ha.

c) Dump Management:

Details of solid waste management are already given in para 4.3.1D above. As already mentioned, the inactive waste dumps and mine boundary are provided with 3 garland drains, two along dump bottoms and one along lease boundary. The garland drains are connected to two settling tanks created in lease area to collect surface runoff and mine water. It is also proposed to construct garland drain for the proposed dump south of the eastern block. This garland drain will be connected to the settling pond of adequate capacity on the southern side of East block. **(Refer Figure No 4.3)**

Due to systematic and well planned designing of dump management on above lines, soil erosion from dumps and land degradation resulting therefrom will be minimal. Good afforestation measures along dump slopes, etc will result in slight improvement in environmental betterment and sustainability to great extent.

In the ultimate stage, plantation / bench plantation will be carried out in 35.77 Ha mined out area including 3.897 Ha of backfilled area. Besides, 16.72 Ha. of Dump area & Topsoil storage area of 3.70 Ha will also be covered with plantation. Besides, Green belt over an area of 14.13 Ha will be carried out along mine periphery, virgin area and along the mine hauling roads. Thus about 70.32 Ha covered under Green Belt/ Bench Plantation in the total lease area of 96.82 Ha in post operational period.

4.6 BIOLOGICAL ENVIRONMENT:

4.6.1 Existing Flora and Fauna:

Other than thorny bushes and few plantations done by the company the core zone is free from any natural vegetation.

4.6.2 Impact of Mining on Biological Environment:

The impact on Biological environment due to mining will be mainly due to: Noise generation from mine may affect fauna.

- ❖ Clearance of land for mining.
- ❖ Impact on the trees like retardation of tree growth, tip burning, etc, due to deposition of dust and the suspended Particulate matter generated from the mining operation
- ❖ Impact on growth of vegetation in case of lowering of water table.

In case of this mine this does not arise, as the area is devoid of any major natural vegetation.

There are no forest lands in this area having biodiversity, wildlife habitats, migratory corridors, migratory avi-fauna, rare endemic and endangered species and medicinal plants.

Other Indian Pea Fowl (*Pavo Cristatus*) no other schedule – I species are found in the study area. Due to systematic and scientific mining operations of TRCL and adoption of various mitigative measures no impacts due to mining activity is observed on this front.

4.6.3 Control Measures for Biological Aspects:

To reduce the adverse effects on flora/fauna status of the area due to deposition of dust generated from mining operations, water sprinkling and water spraying systems will be ensured in all dust prone areas to arrest dust generation.

Methodical and well-planned plantation scheme is being carried out depending upon the immediate need, priority and availability of land which will be continued in future also. The plantation is being done in multiple rows in a staggered way to cover the area to give the desired stratified appearance of multi tiers. More than 10100 plantations of native species have been raised in this area so far.

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.

The different areas where green belts are already developed (**Refer Photo 4.6A-F**) are:

- 1) Peripheral portions of the mine lease area.
- 2) All along the roads in the project area.
- 3) Around infrastructure area

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

A) Green belt around mine dumps, etc.:

- ◆ 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.

B) 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.

Planning the mining sequence has been done so as to have the least requirement of the land and take necessary steps for ultimate reclamation of the mined out land so that the land after is brought under afforestation programme.

With the provision of retention walls, garland drains and vegetation of dumped areas there shall be reduction in soil erosion. This in turn will improve the natural vegetation growth by improving the species density.

In the mine closure stage, the project authorities intends to reclaim about 70.32 Ha in mining lease area with better environmental quality indices due to raising of good green cover with creation of water body in mine voids which can improve the floral content and attract fauna to the mined out area. Thus the project shall ultimately leave a congenial environment for improvement of floral and faunal population.

The final selection of species will be done as per advice of local forest department. Thus every effort will be made for regeneration of biodiversity of the mined out area in a scientific way to better the land status.

4.6.4 Green Belt Status:

Presently about 9.175 ha of land are covered with greenery. Trees already planted include Neem, Eucalyptus, Naval, Tamarind, Teak, Aval Vagai, Mango, Guava, Kodikai, Nettiilingam, Coconut, Pungai, Mangium, Casurina, Arasa, Murungai, Banana, Seetha, Vanni, Yellow Arali etc.

In the present scheme period about 1.40 ha of land will be covered with plantation. This systematic plantation will be continued upto life of mine. Besides, finally the backfilled mined out area of western block will be reclaimed with spreading of top soil over it and plantation will be carried out over this area.

4.6.5 Existing Plantation:

Presently about 9.175 Ha of area are covered with plantation / green belt, of which 2.90 Ha are within the lease area and the remaining 6.275 Ha are outside the lease area. The details of existing Plantation are given below:

Place of afforestation	Nos of Plants	Survival Percentage	Area covered (Ha.)
ML- 21.00 to 22.00 North side/ Footwall side	1400	74 %	1.400
ML- 15.00 to 18.00 North side/ Footwall side	1550	70 %	1.500
Out Side Lease area	7150	65%	6.275
Total	10100		9.175

Trees already planted include Neem, Eucalyptus, Naval, Tamarind, Teak, Aval Vagai, Mango, Guava, Kodikai, Nettiilingam, Coconut, Pungai, Mangium, Casurina, Arasa, Murungai, Banana, Seetha, Vanni, Yellow Arali etc.

GREEN BELT IN & AROUND THE LEASE AREA

Photo 4.6





4.6.6 Proposed Plantation:

In the scheme period about 1.40 Ha within the lease area will be developed with plantation /Green belt. While the species chosen for green belt are fast growing with good canopy and dense leaf density, the avenue plantation shall have fruit and flower bearing and some ornamental plants to give good aesthetic look. Every year on average 750 saplings will be planted. It is planned to plant Neem, Tamarind, Pungai, Naval, Jatropha, Mango etc.

In the ultimate stage, plantation / bench plantation will be carried out in 35.77 Ha mined out area including 3.897 Ha of backfilled area. Besides, 16.72 Ha of Dump area & Topsoil storage area of 3.70 Ha will also be covered with plantation. Besides, Green belt over an area of 14.13Ha will be carried out along mine periphery, virgin area and along the mine hauling roads. Thus about 70.32 Ha covered under Green Belt/ Bench Plantation in the total lease area of 96.82 Ha in post operational period.

4.6.7 CONSERVATION PLAN:

As mentioned in Para 3.7.2, Chapter – III, Schedule – 1 species Indian Pea Fowl (*Pavo Cristatus*) is commonly found in the region. 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. However, Conservation Plan for Indian Pea Fowl (*Pavo cristatus*) is prepared in consultation with the Forest Ranger, Villathikulam range on a combined basis for all the leases of TRCL and its cement plant in the region. This conservation plan was submitted and approved by District Forest Officer- Thoothukudi and the copy of the same is enclosed vide **Annexure – 17**.

Salient aspects of the plan are given below:

4.6.7.1 MAJOR THREATS IN THE STUDY AREA:

4.6.7.1.1 IMPACT WITHIN THE LEASE:

In active project area there is no observation of Peafowl because of the project activities, open land and less vegetation. Many activities like direct mining operation involving blasting, drilling excavation, transportation, dumping etc., clearance of vegetation, road making, lighting are likely to affect the species in the area. Their impact is indicated below to help plan for minimizing them to the extent possible.

4.6.7.1.2 PERCEIVED THREAT 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 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.

During the survey, it was observed that there is no major threat in the buffer zone. But in 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

4.6.7.2 CONSERVATION AND IMPROVEMENT OF HABITAT:

The following measures are proposed for conservation of the species:

- i. Control of Air Pollution, water pollution, noise and other environmental parameters.
- ii. Habitat improvement
- iii. Garbage Management
- iv. Conservation education

i) CONTROL OF ENVIRONMENTAL POLLUTION:

Various environmental mitigative measures are and will be implemented in the mining and cement plant areas to prevent any adverse impact on the environment and ecology as described in the EIA / EMP report and in the approved conservation plan report given vide **Annexure – 17.**

ii) HABITAT IMPROVEMENT:

Towards habitat improvement the following measures are suggested:

(a) Plantation: It is therefore necessary to take up plantation of suitable species for providing adequate cover and fodder for the animals. Its details are given in the EIA / EMP report and also in the approved conservation plan report given vide **Annexure – 17.**

(b) Conserving or Restoring water bodies:

Scarcity of water is main issues 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.

ii) GARBAGE MANAGEMENT:

The following measures will be taken to manage the same.

- ❖ 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 into 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 into manure. The Manure obtained from these pits will be utilised for plantation purpose.

iv) CONSERVATION EDUCATION:

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.

4.6.7.3 BUDGET:

The proposed combined budget for all the leases of TRCL and its cement plant for conservation plan of Schedule - I Species (Pea fowl) are given below

Table No – 4.4

Budget for Intervention of Schedule - I Species (*Pavo cristatus*)

Activity	Rs in Lakhs					
	1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year	Total
1. Environmental control measures in the lease area	In built in the respective operating cost of the project					
2. Habitat Improvement	0.75	0.75	0.75	0.75	0.75	3.75
3. Conservation education	0.25	0.25	0.25	0.25	0.25	1.25
Total	1.00	1.00	1.00	1.00	1.00	5.00

- Though the budget forecast is fixed for 5 years it may be reviewed every financial year in consultation with concerned forest official based on the prevailing inflation rates,
- Cost towards item 1 will be spent directly by the company, whereas for 2 and 3 it will be done in consultation with the forest department.

4.6.7.4 APPROACHES FOR IMPLEMENTATION OF PLAN

This plan will be executed and implemented through the Plant head of RR Nagar cement works & Sr. DGM (Mines). Necessary guidance from forest 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.

4.6.7.5 CONCLUSION:

Based on the study, peafowls were encountered in the buffer zone only for feeding and in the core zone there is no suitable habitat for peafowl. Based on this it is very clear that project operations are not affecting the peafowl population, habitat and other activities. But still it is necessary to take some conservation measure like habitat restoration in the buffer zone to ensure the future of Indian peafowl.

The Ramco Cements Limited is very active in related to biodiversity and conservation. The company is working very closely to address conservation issues; in past also they worked in the area of green belt development, habitat restoration and biodiversity assessment for various projects and programs.

This report on Conservation Plan for Pea fowl recommends several prevention and mitigation measures as well as habitat improvement programs planned to protect biodiversity in the study area. This plan has covered important aspects such as habitat restoration, biodiversity conservation and conservation measures and eco-development to address social and conservation issues. It also provides financial outlay of its implementation cost. All these measures will be strictly enforced and the conservation of the Peafowl will be ensured.

Apart from the pea fowl conservation, Ramco cements Limited understood the prevailing Act and Rules such as Wild Life (Protection) Act 1972, Environment (Protection) Act 1986, The Water (Prevention and Control of pollution) Act 1974, The Air (Prevention and Control of pollution) Act 1981, Tamilnadu Forest Act 1882 etc, and will ensure the strict adherence of all such related acts and rules.

The report of adherence of Pea fowl conservation plan shall be submitted annually to The District Forest Officer Thoothukudi.

4.7 SOCIO-ECONOMIC FACTORS:

As there are no habitations or hutments in the core zone area, no rehabilitation or resettlement problems will arise here. The predicted pollution scenario in respect of ambient air quality, Noise levels, water aspects, biological aspects etc. have been described earlier in this chapter, which show that all these environmental parameters, even after expansion of the

project, will be well within the statutorily prescribed levels. As such, impact due to the project will be positive on socio-economic aspects.

It will be ensured that the buffer zone of the Mines will be properly preserved environmentally in all respects within sustainable limits through necessary monitoring. The project is being operated with due care for minimizing environmental impacts with proper EMP measures for pollution control which will be continued in future also.

The project operation has resulted in direct employment opportunities for about 46 persons. Besides, indirectly about 200 persons are benefited by gainful indirect employment opportunities through various service related activities connected with the project operations as shown under.

- Project related ancillary services
- Project related logistical operations for transport of limestone to cement plant, etc, bringing various materials for project operations, etc.
- Various trading services for consumer goods, spare parts, sundry items, etc.
- Contractual services connected with the project.
- Green belt and horticultural works in the project.
- Casual labor needs for various activities.

Besides, there is marked improvement of various facilities in the local areas due to project operation. The salient features of which are listed below:

- ❖ Improvement in medical and health care system
- ❖ Improvement in educational services
- ❖ Infrastructural betterment through better roads, lighting and communicational Systems
- ❖ Betterment of drinking water facilities.
- ❖ Vocational training facilities for local eligible youth of local community to enable them to seek employment in suitable project operations and elsewhere.
- ❖ Benefit to the State and the Central governments through financial revenues by way of royalty, tax, duties, etc from this project directly and also indirectly.

From above details, it is clear that the project operations have highly beneficial positive impact in the area.

4.7.1 CSR Activities:

Implementation of benevolent social welfare measures by TRCL under their ‘CSR’ initiatives:

TRCL has adopted proper implementation of their corporate social Responsibility (CSR) programmes as a strategic and prime corporate motto. The company treats CSR as not only philanthropy, but as an important Corporate Mission and have carried out socially beneficial developmental activities in all peripheral areas of local community near to all their operating industrial ventures. In this project also, which is being operated for past many years, the project proponent have carried out extensive and beneficial social welfare activities to greatly improve the social and physical infrastructure of the local area. Elaborate details in this respect are profiled below. Many of the under mentioned welfare measures are also being implemented presently in a progressive manner from the past. The measures are largely designed on need based aspirations of local villagers. Some of the salient CSR activity carried out by TRCL (**Refer Photo 4.7**) is listed below

- The local people especially the women from the downtrodden community and women self-help group are involved in social forestry and avenue plantation program, fruit orchid, fodder farms, vocational training in tailoring, embroidery, other cottage industries etc. This will provide the local people regular source of income in the long run.
- Women, in the neighboring villages are provided with sewing machines.
- Classes were conducted to teach sewing, embroidery, doll making by employing qualified teachers.
- Only local women folk were deployed in the afforestation work and in the nursery developed by the company.
- Financial assistance is being regularly provided by the Company Social welfare services wing for conducting local sports, religious and cultural activities.
- Renovation of schools, temples and roads is a regular affair.
- The mined out area water reservoir which is now catering the needs of the local villagers will be utilized for pisciculture by local people.
- TRCL provided Rs.2 crores to Chief Minister’s Relief Fund for flood relief in Tamilnadu
- In Vilathikulam Taluk, provided about 9.0 Lakhs for construction of Vilathikulam Park
- TRCL involved in flood relief at Kurinchnagar in Thoothukudi

TRCL on the whole has spent Rs.7.80 crores during the year 2014-15 under various social welfare measures like donation and repair to temples, school room construction as

addition, up gradation of youth skills of local community, sponsorship for sports and cultural activities etc. Salient points of CSR activities carried out is listed below in **Table No – 4.5 & 4.6**

R.R Nagar unit of TRCL has spent around Rs.172.88 lakhs towards CSR for year 2014 – 15. Rs. 21.96 lakhs was spent in year 2015 – 2016 for CSR activities under Melavenkaleswarapuram Limestone Mine lease head. Its break up is given in **Table No – 4.7**

Table No – 4.5

CSR ACTIVITIES CARRIED OUT BY TRCL

S.No	MOU Classification	Year 1 (2011-12)	Year 2 (2012-13)	Year 3 (2013-14)	Year 4 (2014-15)	Year 5 2015-16
<u>CSR As per MOU with District Collector</u>						
1 a)	Scholarship	100000	100000	50000	0	19161
1 b)	Vocational	0	204457	159132	158442	114717
2 a)	Medical Camp	67348	49279	25000	28500	516171
2 b)	RO Plant	0	1685596.75	186517	345030	0
3	Solar Light	0	395100	500888	0	0
4	Tree	464552	3835903	663916	8020	41750
5	E-Village	0	48000	50000	0	0
6	Namakku	0	1073336	267000	250000	0
7	Infrastructure	0	798557	682805	6220000	5960632
<u>Other than MOU</u>						
8	RSSL	424474	657453	8212537	1709439	1388786
9	Other CSR	1436361	6109098	1245731	3664532	591173
	Total	2492735	14956779	12043525	12383963	8632390

Table No – 4.6

MISCELLANEOUS CSR ACTIVITIES

Medical services	
External medical aids	660 Persons
General medical camps(4/year)	20,000 Persons
Eye camps (3/year)	10,000 Persons
Selected for operation	1,800 Persons
Polio eradication camp 3/year)	500 Persons/Camp
Educational Services	
Free note books (To poor & orphanage students)	10,000 Persons
Free uniform dresses (To poor & orphanage students)	200 Persons
Financial aid for higher studies (For dipoloma, degree students)	300 Persons
Sweets & flags for schools (on 15th August & 26th january)	20 Schools/Function
Tricycle, blind stick, artificial limb and polio caliper for handicapped	100 Persons
Dresses for poor people	2000 Persons
Dresses, bedsheets and sweets on function days	10 Orphanage
Social Welfare Services	
Prizes for handicapped school students	800 persons
Dress, plates, tumblers and water drum for balvadi schools	60 villages
Guiding people for getting government aids like tricycle, blind stick, artificial limb & polio caliper etc. for handicapped	680 persons
Awareness Services	
Motivational services	
Tuition Centres	10 villages
Self-development Services	
Tailoring schools in 2 Villages	320 persons
Environmental Services	
Tree Plantation	15,000 Plants

As a result of various 'CSR' activities as above, the social and physical infrastructure of the local community and local area have improved greatly in respect of income level increases, betterment of educational knowledge skill upgradation of local youth through training, health case improvement through frequent medical check-ups and supply of free medicines etc. This being an interior rural area with no other major industries, the CSR activities of TRCL have increased the Human Development index of the area.

Table No. 4.7

CSR activities under Melavenkaeswarapuram Limestone Mine lease (Year 2015- 2016)

S.No	Particulars	Amount in Rs.
1.	Scholarship	20,000
2.	Educational Training – KelArunachalapuram	18,000
3.	Distribution of Notes & Books	15,000
4.	General Medical Camp - Mel Arunachalapuram	25,000
5.	General Medical Camp – Sivalarpatti	45,000
6.	General Medical Camp – Kullakatankuruchi	3,000
7.	Medical aids – Pudur	5,000
8.	Construction of Handpumps – Melavenkateswarapuram, Senayampatti, Madathupatti & 4nos in Pudur,	3,50,000
9.	Renovation of Pond & Rainwater drainage channel in Melavenkateswarapuram	60722
10.	Fund to Temples in Pudur, Melavenkateswarapuram, Madathupatti	15,30,000
11.	Marriage Hall in Muthuswamipuram	1,25,000
	Total	21,96,722

CSR ACTIVITIES CARRIED BY TRCL

Photo 4.7



INVOLVED IN FLOOD RELIEF AT THOOTHUKUDI



PUMPING OUT OF WATER IN FLOOD

தூத்துக்குடியில் வெள்ளம் பாதித்த மக்களுக்கு ராம்கோ நல உதவி

தூத்துக்குடி, நவ. 27-
தூத்துக்குடி, மாவட்டத்தில்
தில் மழை வெள்ளத்தில்
பாதிக்கப்பட்ட மக்களுக்கு
ராம்கோ சிமென்ட் குழுப்
சார்பாக வெள்ள நிவாரண
உதவியாக பிரட், பால் மற்றும்
பெட் சிட்கள் வழங்கப்
பட்டது.
தூத்துக்குடி மாவட்டத்
தில் மழையால் கடுமையாக
பாதிக்கப்பட்ட அந்தோ
ஸியார்புரம், சோர்ஸ்புரம்,
மாதவன் நகர், இத்திரா நகர்,
கோரம்பள்ளம், மறவன்ம
டம் ஆகிய பகுதி மக்களுக்கு



தூத்துக்குடியில் வெள்ளத்தால் பாதிக்கப்பட்ட மக்களுக்கு
ராம்கோ சிமென்ட் குழுப் சார்பில் நல உதவிகள் வழங்கப்
பட்டன.

நேரடியாக சென்னை ராம்கோ
மண்டல முதுநிலை துள்ள
பொது மேலாளர் அசோ
கன், மழை வெள்ளத்தில்
பாதிக்கப் பட்ட
ஆயிரத்திற்கும் மேற்பட்ட
மக்களுக்கு பிரட், பால் மற்
றும் பெட்சிட் வழங்கினார்.
இதன்போது திருவள்ளூர்
வேலி மண்டல விற்பனை
உதவி பொது மேலாளர்
ராஜேந்திரன்,
ஆர்.ஆர்.நகர் செய்தி மக்
கள் தொடர்பு அலுவலர்
முருகேசன், சமூக சேவை
பிரிவு தேவராஜ் மற்றும்
வட்டார வளர்ச்சி அலுவ
லர் முருகானந்தம், துள்ள
வட்டார வளர்ச்சி அலுவ
லர் கிரி மற்றும் ராம்கோ
சிமென்ட் விற்பனை
மேலாளர்கள் கப்பிரமணி
கள், இருவருடைய கலந்து
கொண்டனர்.



PROVIDED RS. 2 CRORES TO CHIEF MINISTER'S RELIEF FUND FOR FLOOD



DISTRIBUTION OF NOTES & BOOKS TO SCHOOL STUDENTS



PROVISIONS TO BALWADI FOR CHILDRENS



SAPLINGS FOR SCHOOL



**TRAINING FOR TAILORING –
MFI A RIINACHAI APIRAM**



**DISTRIBUTION OF CLOTHES TO ELDER
PROVIDED FUND OF RS. 9.0 LAKHS FOR**



MEDICAL CAMP FOR EYES & AWARENESS PROGRAMME FOR DONATION OF EYES





GENERAL MEDICAL CAMP



IN PUDUR



IN MELAVENKATESWARAPURAM



IN SENAYAMPATTI

CONSTRUCTION OF HAND PUMP FOR DRINKING WATER





**CONSTRUCTION OF ROAD FROM PUDUR –
MV PURAM**



**PROVIDING VEHICLES TO PHYSICALLY CHALLENGED
PERSONS IN PUDUR & OTHER VILLAGES**

The future proposals in the local area will be as under.

Future Proposal:

Based on the needs of the people as given in para 3.2.4, chapter – III, in future the following social welfare activities will also be undertaken by project authorities to improve the physical and social infrastructures of the local community.

- Roads in the villages shall be repaired and maintained.
- Educational facilities shall be improved.
- Implementation of effective rainwater harvesting system.
- School books & uniforms for poor people shall be provided. Meritorious poor children shall be provided scholarships.
- Financial assistance for conducting local sports, religious and cultural activities.
- Proper drinking water supply shall be provided and regular chlorination of drinking water shall be done..
- Frequent Medical camps will be conducted for the benefit of villagers.
- Awareness programme for the villagers on sanitation, improvement in health standards, birth control. Malaria eradication, HIV prevention, etc, shall be conducted.

Details of annual budgetary proposal for various socio-economic works are given below in **Table No 4.8:**

Annual Budget for Socio – Economic Works Table No 4.8

Particulars	Expenditure
Education	
1. School books, uniforms, to school children	Rs.2.00 lakhs
2. Scholarships, Repairs and Maintenance of school buildings	Rs.3.00 lakhs
Health camps	Rs. 4.00 lakhs
Water supply & sanitation in villages and maintenance of village roads	Rs. 1.50 lakhs
Sanitation in villages	Rs. 1.50 lakhs
Maintenance of village roads	Rs. 3.00 lakhs
Training of village women	Rs. 3.00 lakhs
Plantation in villages	Rs. 2.00 lakhs
Total	Rs. 20.00 lakhs

4.8 Impact and remedial measures for occupational health and safety aspects:

4.8.1 Baseline Status:

The mining operation in this area is going on from 1985 onwards and no construction of any occupational disease due to mining operations have been noticed either amongst workers or amongst nearby village population.

Primary data collection through field survey conducted in the locality reveal that there is no reported incidents of any occupational diseases in the area. Good medical services for local areas and their workers are rendered by TRCL through their Dispensary and small hospitals established in the area.

Hazardous jobs like blasting, loading, etc. are planned to be executed safely and with all precautionary measures as prescribed in Metalliferous Mines Regulations of 1960, so as to minimize hazards and incidences of health problems.

4.8.2 Impacts on occupational health due to project operations:

Anticipated occupational illness sequel to mining activities can be as follows:

- Dust related pneumonia
- Tuber culosis
- Rheumatic arthritis
- Segmental vibration
- Miner's Nystagamus.

4.8.3 Mitigative measures for occupational health:

To reduce pollution emanation from the project, following measures are being and will be taken:

- Water sprinkling on haul roads and dumping yards, etc.

- Wide green belt barrier creation to arrest dust and reduce noise propagation.
- Acceptance of good control measures for reducing air pollution, as mentioned earlier in the chapter.
- Control of noise levels through good preventive maintenance of machineries, green belt creation, provision of ear muffs to workers, etc.

In addition to above measures, the following remedial steps are being and will be enforced to ensure minimization of occupational health and safety problems.

- Medical examination at pre-entry level stage of workers, etc, by qualified doctors, with periodical examination of all workers/staff at least once a year, as per DGMS circulars. Last year 118 employees of TRCL including the contract employees were covered for medical checkup. Recently Medical examination for both contract & company employees were carried out during June 2015 and a copy of “Form O” is attached as **Annexure – 13**.
- Tests to be conducted on staff/workers will include spirometry, audiometry, vision test, x-ray, ECG, etc.
- Regular awareness campaigns amongst staff and workers about AIDS, Malaria, etc.,
- Provision of ambulance and First aid facility with complement strength of Doctors, nurses, etc, as necessary.
- Organization of fortnightly medical camps at local areas for treatment of patients, especially senior citizens, children and ladies.
- All staff and workers will be provided with PPE to guard against excess noise levels, Dust generation and inhalation, etc., as per standards prescribed by DGMS.
- Occupational health checks up and assessment will be done by trained Doctors from Government Hospital for Occupational Health. Their advice will also be sought frequently in this respect. Health report will be given to employees regularly after health checkups.
- Vocational training will be imparted to all workers/ staff before induction, to make them familiar with jobs and the safety precautions to be taken while doing the jobs. Refresher training will also be arranged as per statutes.
- Provisions of regular records of health checkups, etc. A total budgetary recurring provision of Rs. 6.0 lakhs is envisaged for occupational health management, towards financial outlays for ambulance, doctors, staff, medicines, health camps and checkups, etc.,

4.8.4 Details of infrastructural facilities provided to workers:

TRCL has provided following infrastructural facilities for workers.

- Residences for workers in colony.
- Provision of personal protective devices like earmuffs, gloves, helmets safety boots, goggles, etc., so as to serve as safety devices to prevent injury, accident, etc during operational periods.
- Provision of site services like office, first aid room, toilets, rest shelter drinking water arrangements, etc.
- Workers are provided medical and health care assistance through approved and qualified doctors of company.
- In case of hospital treatments at specialized hospitals, enough medical assistance is provided to staff and workers for full treatment.
- Educational services in schools of company and provision of scholarships, etc.
- Regular checkup of workers for defecting occupational health problems promptly for prompt treatment.

4.8.5 Mitigative measures for safety aspects:

These measures which are being and will be enforced are as under.

- Formation of safety committee under assistant mines manager, with representation such as mines foreman, engineers, Doctor and workers representatives. They will meet at least once a month to over view all safety aspects and corrective measures enforcement.
- Before commencement of any new mine section, the committee will meet to review the safety measures to be adopted in the scheme.
- Organization of safety contests and safety campaigns regularly to update knowledge of safe operational procedures, etc.
- Frequent review of accident cases to ensure initiation of prompt measures to avoid or reduce accidents.
- Provision of safety Helmets, goggles, safety boots, ear muffs, gas masks, etc. to workers /staff to protect them against pollutional aspects and to minimize accident rates.

In view of above mentioned mitigation measures to minimize impacts on occupational and safety aspects, the impact on these aspects due to project operations will be insignificant and minimal, as is evidenced by study of past incidences on these aspects.

4.9 IMPACT ON LOCAL LOGISTICAL SYSTEM DUE TO PROJECT:

The expansion project involves the following production figures with supporting machinery for achieving target.

In the present workings, the ROM limestone despatchers are made to the crusher system at Pandalgudi about 14 kms away through dedicated black topped roads.

The transport details are as follows:

Sl.no	Particulars	Existing	After Expansion
1	Production in MTPA	0.101	0.50
2	No of working days in a year	300	300
3	Daily transport capacity from this mine	340	1670
4	No of Transport hours per day	6	8
5	Truck capacity in T	30	30
6	No of trips per day	12	56
7	No of trips per hour	2	7

Since the transportation from the Melavenkateswarapuram limestone mine to the Crusher plant and subsequently to the RR Nagar cement plant is through dedicated road of TRCL only and the increase in number of trips per hour is just marginally higher, the dedicated black topped road maintained by TRCL can easily absorb the tolerable increase of about 5 trips of trucks per hour without causing significant impact on logistical system in the area. Besides, the road system will be frequently maintained to make it easily and smoothly motorable.

CHAPTER – V

ANALYSIS OF ALTERNATIVES

5.1 Alternate Technology:

This is an ongoing mining project for past 38 years, in which Open Cast mining technology of shovel-Dumper and Tipper combination has already been selected after a thorough examination of various techno-economic factors. As the Open Cast mining operations are going on smoothly and efficiently, consideration of an alternate technology is not warranted for this expansion proposal.

5.2 Alternative Site:

After obtaining necessary statutory clearances, mining operations in this ML area is in progress for the last so many years. So the question of seeking alternate site does not arise.

CHAPTER – VI

ENVIRONMENTAL MONITORING PROGRAMME

6.1 General:

In this ongoing project, appropriate environmental monitoring programme is already in place. Regular, systematic and sustained programme schedules for implementation and monitoring of various control measures are devised with clear cut guidelines of various concerned plans for keeping a continuous surveillance on the various environmental quality parameters in the area.

The monitoring schedules are planned to aim at regular and systematic study of various pollution levels with respect to air and water quality, noise levels etc., to ensure that they conform to the standards laid down by the Environment Protection Act, 1986 and various Central and State Pollution Control Board Limits.

The various methodologies and frequency of studies of all environmental quality parameters will be as per prescribed norms laid down by MOEF&CC and State Pollution Control Board.

Environmental control measures include components like land degradation, air, water and soil quality, noise levels, effective land reclamation for excavated areas and solid waste dumps, afforestation measures, etc. For monitoring of environment over the life of the mine, a set of stations for study of quality parameters are fixed as per the actual requirements and prevailing conditions of environmental factors, as dictated from time to time, depending on the prevailing pollution levels.

6.2 Environmental Policy:

TRCL is operating various limestone mines and linked cement plants in Tamil Nadu, Andhra Pradesh and Karnataka. The total installed capacity for their cement plants in various states, as above, is about 14.45 million tonnes.

TRCL has been operating the above mentioned limestone mines for more than 5 decades.

Hence, as mentioned in Chapter I earlier, TRCL is an experienced and expert company for exploitation of Limestone mines in an efficiently, systematically and technically scientific manner, with proper preservation of environmental attributes of various projects through strategic and environment friendly operational modes.

Because of their technical expertise, TRCL has laid out a comprehensive and effective environmental policy so as to detect promptly departures or violations of environmental standards and to take immediate corrective actions to set right the environmental status within statutory standards.

The company has a well laid out and integrated Environmental policy, with corporate motto for environmental preservation in its mines and cement plants, etc a strategically important objective, and which has been approved by Board of Directors. Salient features of this policy are profiled below.

- ❖ The company and its board of Directors aims to ensure environmental preservation of the area ideally at statutory and superior levels, with adoption of remedial measures for control of air, water quality, noise status, biological improvements, green belt creation, etc, for the life of the project.
- ❖ The company has adopted 'CSR' activities as one of its prime corporate motto for everlasting and continues improvement of physical and social infrastructures for the welfare of local community. Financial outlays have already been incurred and in future also it will be continued. The aspirational needs of local people will be sought in this respect, before implementation of welfare measures.
- ❖ All the workers and staff should ensure that all mining operations such as deployment of HEMM, conduct of drilling and blasting operations, etc are strictly conducted (in keeping with regulatory standards maintain a safe working environment in the area, without any unforeseen mishaps, etc.
- ❖ All rules and conditions prescribed in the Indian mines Act, Metalliferous Mining Regulation, Mineral Conservation and Development Rules, etc, should be adopted to ensure risks-free and safe mining operations. All personal protective devices supplied to workers and staff should be used while they work in the mines sand any violation in this respect will be dealt with INFLICT of warnings first, followed subsequently by punitive punishments including fines and ultimately dismissal, if repeated continuously.
- ❖ All drilling and blasting operations, involve risk, the former due to re-drilling in hole sockets unknowingly and the later due to handling and transport of explosives and detonators, making lapses carelessly, while loading, tamping, etc, resulting in accidents, disasters, etc.

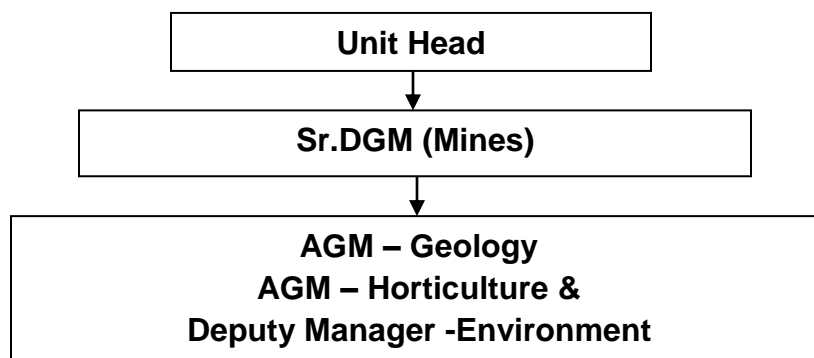
- ❖ All employers and staff should attend compulsorily the vocational training and first aid classes frequently held. Safety classes and campaigns should also be attended by them.
- ❖ Any infringement / violation of any rule or unsafe mining operations should be reported mines manager, should be reported by the foremen, blaster, mate etc, who will take immediate corrective measures for avoiding major disasters. The report will ultimately reach the Board of Directors through upwardly hierarchical communicative channels from the lowest level to superior levels in quick time bound duration.
- ❖ The mines manager duly assisted by Environmental Engineer should exercise overall control over entire mining and connected operations and all infringements / violations on any count pertaining to unsafe operations, environmental degradation, etc, should be brought to the notice of the Board of Directors. Remedial measures for such violations and deviations should be take care by the mines manager to avoid any hazards or disasters in the mine and nearby areas. The persons responsible for such violations will be punished through appropriate disciplinarily penal actions.
- ❖ The EC conditions and stipulations will be strictly observed by all supervisory staff of the mine and connected works, in various issues like prescribed environmental monitoring schedules conducting of vibratory studies due to blasting, creation of green belt, management of dumps, occupational health review, etc.
- ❖ The strict compliance of EC conditions should be ensured by frequent checks by the in charge of mining operations of the company. Any departures of operational mode from such conditions should be overseen by the entire Board of Directors, for proper redressal measures for complying with the EC stipulations.
- ❖ Penalty actions will be taken by the company in cases of continuous negligence resulting in violations deviations in this respect.
- ❖ A time schedule of once in 15 days for review of all operational factors as mentioned above is enforced, for proper and quick corrective actions needed in the matter.

For achieving above schedules in time and taking corrective step forthwith formation of an environmental cell has already been done and it is functioning effectively to oversee and regulate environmental functions, including proper monitoring of various parameters. Thereby, it is ensured that all measures of EMP are properly implemented in respect of air quality, water quality, noise control plantation programmes, reclamation of dumps and backfilled areas, execution of social development schemes, etc.

The organizational chart for this cell is given below in **Figure No 6.1** From this chart, it can be seen that top echelons at Directorial levels in Board also play a great role in environmental control as they frequently review and oversee the control schemes for taking necessary action in cases of lapses on this front from any functional staff.

The organizational chart for above environmental cell is given below:

Figure No 6.1



The Sr.DGM (Mines) / AGM-Geology / AGM-Horticulture at the mine project site will be directly responsible for various environmental activities in the mine. At the Headquarters, the board director and advisor in-charge of mining will correlate and oversee the environmental activities and their effective implementation in consonance with the guidelines in the EMP. The Unit head at Pandalgudi will oversee the environmental administration at the mine, through the Sr.DGM (Mines) / AGM-Geology / AGM-Horticulture, who will directly, supervise all activities of environmental administration. Manager, Dy. Manager can give staff support to mine staff on environmental issues.

In addition to the above explanations, regarding the executive level, staff support has to be provided by way of employing unskilled workers for carrying out various activities.

The Environmental policy also lays down that there should be regular communication channels between different functional staff on upward and downward directions. In case of any violation or departure of any environmental attribute from standards, the functional divisional head should immediately communicate the facts to mines manager who will interact with Asst.General Manager (Mines) and ultimately unit Head the matter to Director in Boards about such happenings and they will immediately in consultation with Sr.DGM (Mines) decide own immediate action to be taken in the matter. If any carelessness is observed on part of any functional staff, punitive actions such as warning, fining and suspension or in extreme cases dismissal will be resorted to. The protocols to be followed in above happenings are well delineated in the policy.

In case of small lapses, the control measures can be reinforced immediately by giving proper directions to the staff.

In case of all departures and violations which are of grave nature and adversely affect the operation, thorough probe will be made by a committee consisting of a Director of Board, Sr.DGM (Mines) and AGM-Geology. The AGM-Horticulture & Dy.Manager (Horticulture) may also be associated in the matter.

Depending on probe findings, necessary actions will be initiated against erring personnel and punitive punishments will be awarded to them. To prevent future occurrences of such violations, advance steps will be planned and incorporated in the control measure system adopted for environmental control. Such major violations will also be informed to shareholders through appropriate communicational mode like letters, calling special meeting of shareholders, etc.

Elaborate description about risk and disaster management, emergency situations control for both onsite and offsite emergencies, etc are spelt out in Chapter VII.

From above, it can be seen that TRCL has a well laid out Environmental Policy defining norms for dealing with violation of environmental standards and indicating hierarchical channel communication system in case of violations and redressal of same as well as the involvement of Board of Directors and shareholders in such processes.

6.3 Environmental Monitoring schedules:

6.3.1 AIR ENVIRONMENT:

The following monitoring schedule is given for ambient air quality.

Parameters:

Sulphur dioxide (SO₂), Oxides of Nitrogen (NO_x), Suspended Particulate Matter (SPM), Respirable Particulate (PM- 2.5/10).

Frequency of Monitoring:

2 days in a week in a month in each location.

Location:

5 locations in the buffer zone and 2 work zone locations.

The environmental standards for Ambient air quality prescribed by CPCB/MOEF&CC/SPCB given vide **Table No 6.1** will be enforced in this mine.

Table No - 6.1

[SPM 111—TABLE 4]

आज का समाचार : अक्टूबर 2009

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**NATIONAL AMBIENT AIR QUALITY STANDARDS
CENTRAL POLLUTION CONTROL BOARD
NOTIFICATION**

New Delhi, the 18th November, 2009

No. B-29016/20-90/PCI-L—In exercise of the powers conferred by Sub-section (2) (b) of section 16 of the Air (Prevention and Control of Pollution) Act, 1981 (Act No.14 of 1981), and in supersession of the Notification No(s). S.O. 384(E), dated 11th April, 1994 and S.O. 935(E), dated 14th October, 1998, the Central Pollution Control Board hereby notify the National Ambient Air Quality Standards with immediate effect, namely:-

NATIONAL AMBIENT AIR QUALITY STANDARDS

S. No.	Pollutant	Time Weighted Average	Concentration in Ambient Air		
			Industrial, Residential, Rural and Other Area	Ecologically Sensitive Area (notified by Central Government)	Methods of Measurement
(1)	(2)	(3)	(4)	(5)	(6)
1	Sulphur Dioxide (SO ₂), µg/m ³	Annual* 24 hours**	50 80	20 80	- Improved West and Gaeke -Ultraviolet fluorescence
2	Nitrogen Dioxide (NO ₂), µg/m ³	Annual* 24 hours**	40 80	30 80	- Modified Jacob & Hochheiser (Na-Arsenite) - Chemiluminescence
3	Particulate Matter (size less than 10µm) or PM ₁₀ , µg/m ³	Annual* 24 hours**	60 100	60 100	- Gravimetric - TOEM - Beta attenuation
4	Particulate Matter (size less than 2.5µm) or PM _{2.5} , µg/m ³	Annual* 24 hours**	40 60	40 60	- Gravimetric - TOEM - Beta attenuation
5	Ozone (O ₃), µg/m ³	8 hours** 1 hour**	100 180	100 180	- UV photometric - Chemiluminescence - Chemical Method
6	Lead (Pb), µg/m ³	Annual* 24 hours**	0.50 1.0	0.50 1.0	- AAS/ICP method after sampling on EPM 2000 or equivalent filter paper - ED-XRF using Teflon filter
7	Carbon Monoxide (CO), mg/m ³	8 hours** 1 hour**	02 04	02 04	- Non Dispersive Infra Red (NDIR) spectroscopy
8	Ammonia (NH ₃), µg/m ³	Annual* 24 hours**	100 400	100 400	-Chemiluminescence -Indophenol blue method

4 THE GAZETTE OF INDIA : EXTRAORDINARY [PART III—Sec. 4]

(1)	(2)	(3)	(4)	(5)	(6)
9	Benzene (C ₆ H ₆) µg/m ³	Annual*	05	05	- Gas chromatography based continuous analyzer - Adsorption and Desorption followed by GC analysis
10	Benzo(a)Pyrene (BaP) - particulate phase only, ng/m ³	Annual*	01	01	- Solvent extraction followed by HPLC/GC analysis
11	Arsenic (As), ng/m ³	Annual*	06	06	- AAS /ICP method after sampling on EPM 2000 or equivalent filter paper
12	Nickel (Ni), ng/m ³	Annual*	20	20	- AAS /ICP method after sampling on EPM 2000 or equivalent filter paper

* Annual arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.

** 24 hourly or 08 hourly or 01 hourly monitored values, as applicable, shall be complied with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

Note. — Whenever and wherever monitoring results on two consecutive days of monitoring exceed the limits specified above for the respective category, it shall be considered adequate reason to institute regular or continuous monitoring and further investigation.

SANT PRASAD GAUTAM, Chairman
[ADVT-III/4/184/09/Ext.]

Note: The notifications on National Ambient Air Quality Standards were published by the Central Pollution Control Board in the Gazette of India, Extraordinary vide notification No(s). S.O. 384(E), dated 11th April, 1994 and S.O. 935(E), dated 14th October, 1998.

6.3.2 WATER ENVIRONMENT:

Water quality monitoring regularly from 3 ground water and mine pit water sample. General, Physical, chemical parameters to be analysed.

6.3.3 NOISE ENVIRONMENT:

Noise monitoring carried at 2 work zone locations inside the mine lease area and in 4 locations in the nearby areas. Besides, vibration studies in the nearby villages are to periodically carried out.

The noise level standards as given by CPCB / MOEF given in **Table No - 6.2** to be enforced in the mine.

Table No - 6.2

NOISE LEVEL STANDARDS

THE ENVIRONMENT (PROTECTION) RULES, 1986

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

Note :

1. Day time shall mean from 6 a.m. and 10.0 p.m.
2. Night time shall mean from 10.0 p.m. and 6 a.m.
3. Silence zone is an area comprising not less than 100 meters around hospitals, educational institutions, courts, religious places or any other area which is declared as such by the competent authority.
4. Mixed categories of areas may be average as one of the four above mentioned categories by the competent authority.

* dB(A) Leq denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

A “decibel” is a unit in which noise is measured.

“A”, in dB(A) Leq, denotes the frequency weighting in the measurement of noise and corresponds to frequency response characteristics of the human ear.

Leq: It is an energy mean of the noise level over a specified period.

Guidelines for permissible noise for industrial workers as laid down by Central Pollution Control Board

Exposure time (in hr. per day)	Limit in dB(A)
8	90
4	93
2	96
1	99
1/2	102
1/4	105
1/8	108
1/16	111
1/32	114

6.3.4 SOCIO – ECONOMIC ENVIRONMENT:

Detailed socio economic studies have been already carried out. Similar studies will be carried out every 5years to ensure that the planned improvements in various services, as mentioned in chapter IV, accrue to the local community and to make up for deficiencies if any.

6.3.5 OCCUPATIONAL HEALTH:

Occupational health survey of staff and workers is being undertaken to detect early incidence of diseases and for prompt remedial medical follow up in the matter. Audiometry test for the workers will be done at regular interval for workers of the noise prone area. Safety matters are also be reviewed periodically by safety in charge.

6.3.6 GREEN BELT STATUS:

The proponent has already carried out extensive green belt development in the ML area and in surrounding areas. To carry on the good work, it should be ensured that the quality and quantity of green belt is maintained as per planned schedule through frequent checks and prompt measure for rectifications if required. Good survival rates (more than 85%) are being achieved to sustain the ecological balance of the area.

The location and the frequency of monitoring shall be suitably modified in consultation with the nodal agency as per the actual requirements and prevailing conditions of the mine and environmental factors, as dictated from time to time, depending on the prevailing pollution levels, if required.

6.3.7 LABORATORY SERVICES:

Presently monitoring is carried out through external agencies. The same can be continued in future also. Else a full-fledged laboratory can be created to take care of the environment monitoring requirement of the cements plant and all the working mines of TRCL in the Melavenkateswarapuram region.

6.4 ENVIRONMENTAL CONTROL COST ESTIMATE:

These being a working mine various environmental control measures like water sprinklers, locating crusher in closed shed, etc are already in place. Expenses incurred towards environmental control measures are met from revenue expenses. The probable cost of recurring environmental control cost for the Melavenkateswarapuram leases are calculated and given below **Table No – 6.3:**

Environmental Control Cost

Table No – 6.3

Rs.in lakhs

Sl. No.	Activity	Recurring Cost /Annum
1	Dust suppression	6.00
2	Construction of garland drains, retention Walls around dumps, check dams etc. desilting and maintenance	9.00
3	Green belt and afforestation	9.00
4	Monitoring of Environmental quality	6.00
5	Occupational Health & Hygiene	6.00
6	CSR Activities	20.00
		56.00

In case of any further necessity for funds for implementation of control measures arises, these will be met without any constraint as and when required.

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CHAPTER – VII

ADDITIONAL STUDIES

7.1 GENERAL:

The additional studies covered for this EIA / EMP report are:

1. Public consultation of the project as per MoEF&CC mandates.
2. Risk Assessment and Disaster Management Plan in connection with mining and allied operations of the project will be spelt out in detail to cover possible dangers / risks / explosions / accidents, etc. likely to arise from the project operations, including onsite and off-site emergency plans to meet the disastrous situations if any.
3. Mine closure planning and various advance actions and finalization of plan to effect closure/abandonment of the mine at the end of mine life.

7.2 PUBLIC CONSULTATION:

MoEF&CC in the TOR had directed the project proponent to conduct Public Hearing/Consultation as per EIA Notification dated 14.09.2006. Accordingly, Tamil Nadu Pollution Control Board had issued Public Notices in major dailies (namely Indian Express and Dhinamani) on 21.01.2016 disclosing the details of the Public Hearing scheduled for this project.

The Public Hearing / Consultation was conducted on 25.02.2016 at T.R.Subbaraj Kalyana Mahal, Paralachi Road, Pudur, Villathikulam Taluk, Thoothukudi District through District Collector -Thoothukudi, District Environmental Engineer - Tamil Nadu Pollution Control Board along with the representatives from M/s. The Ramco Cements Limited, the consultants, press fraternity and the public.

At the outset, the District Environmental Engineer, Tamilnadu Pollution Control Board, Thoothukudi welcomed the District Collector, Thoothukudi District and the public, he briefed the requirement of conducting this public hearing in accordance with the Environmental Impact Assessment Notification, dated 14.09.2006 of Ministry of Environment, Forests& Climate Change (MoEF&CC), Government of India, New Delhi.

The District Collector welcomed the gathering present at the public hearing and informed that the existing limestone mine of M/s. The Ramco Cements Limited, at Pudur, Nadukattur, and Sennayampatti villages, Vilathikulam Taluk, Thoothukudi District, Tamilnadu State has applied

for renewal of lease and also for Enhance the production capacity from 0.101 MTPA to 0.5MTPA of clean limestone for which the project proponent will now explain about the project and requested the public to express their views.

Thiru.Thevaraja, AGM, M/s. The Ramco Cements Limited, gave an introduction of their Mines & Cement factories which are functioning in the State and explained the need for their expansion activity of this Lime Stone Mine.

Then, Mr.Giri Padmanabhan, Consultant, Creative Engineers and Consultants made a presentation highlighting the details of extent of mining, details of mining lease, locations of the mines, land use pattern of the mines, details of existing environmental scenario, impact and mitigative measures with respect to air, water, noise, blasting vibration, hydrology etc., number of persons employed, usage of water in the mines, future reclamation plans of the mines, green belt development, financial commitment on pollution control, established social welfare measures and CSR commitment for future years and concluded that the proposed activity will safeguard the interest of Environment as a whole and necessary social welfare activities will also be taken.

Their objections and supporting views were all well heard and recorded as minutes of the public hearing. **(Details are given in Annexure – 15)**

Totally about 228 numbers of people were present for public hearing, of which about 16 persons expressed their views.

The public hearing went on smoothly. Most of the speakers expressed their sincere gratitude for various CSR activities carried out by TRCL and almost all the speakers were in favour of this expansion.

PUBLIC HEARING PHOTOS



Salient details of issue raised in the public hearing and the response from the proponent are given below:

OPINION BY THE PUBLIC	COMMITMENT OF THE PROJECT PROPONENT
<p>The opinions of the public given in the public hearing meeting are as follows:</p> <p><u>General View:</u></p> <ul style="list-style-type: none"> • People appreciated and mentioned that TRCL management is doing many welfare measures such as conducted health camps, 24 hrs water supply to the nearby villages, laid roads in the surrounding Villages, installed bore well with hand pumps and dug more than 20 Nos of bore wells for the drinking needs of the people in surrounding villages. • People expressed that due to the mining activities of M/s. The Ramco Cements Limited, there were no harms to the Public or to the farmers. • M/s. TRCL's conducting Mining activity more than 40 years in this region however this does not affect and interfere the agricultural land/ farmers • Due to this mining operation by TRCL, the surrounding people get income by way of employments. <p><u>Issues</u></p> <ul style="list-style-type: none"> • Ramco management carries out many welfare measures to nearby village, however, in the villages near the existing mines, some people felt during blasting operations causes vibration in the mines. Hence, the management has to do the blasting activities by using modern blasting techniques. 	<ul style="list-style-type: none"> • . • Mentioned that Trial blasting activity was already conducted in the surrounding Villages in the presence of the Village Presidents and the Public to assess the vibration levels, and in all the cases the Peak Particle Velocity (PPV) is well within the norms of 10 mm/sec. • As PPV is directly proportional to the charge per delay, we have adopted latest blasting techniques like NONEL,

<ul style="list-style-type: none"> • Management shall carryout blasting in the mines without causing Vibrations in the vicinity. • Mines are very deep and hence, the Management should fill the mining completed pits with gravel soil. <p><u>Demands</u></p> <ul style="list-style-type: none"> • Check dams to provide water for the cattle in Pudur village • Upgradation of Education facility in the Pudur village • Construction of compound wall to school in KeelaArunachalapuram • Existing RamcoVidyalaya School at Pandalgudi is to be upgraded from V std to VIII std, so that children can study higher classes in the Ramco School itself. • Water tank may be constructed to cater the needs of drinking water in Kambathupatti. • Employment opportunity to youth in surrounding villages shall be provided • Women college for Pudur & Pandalgudi areas shall be developed • Request to continue their welfare measures in nearby villages 	<p>Electronic system of initiation to maintain charge per hole and charge per delay as the same. By adopting such advanced practices in blasting we are controlling PPV well within the norms of 10 mm/sec.</p> <ul style="list-style-type: none"> • Informed that the controlled blasting is carried out as per the rules only after following all the statutory norms and monitoring is also carried out by the approved agencies regularly. • At the end of mine life proper backfilling, bench plantation and fencing will be carried out. <ul style="list-style-type: none"> • TRCL on the whole has spent Rs.7.80 crores during the year 2014-15 under various social welfare measures like donation and repair to temples, school room construction as addition, up gradation of youth skills of local community, sponsorship for sports and cultural activities etc. TRCL is spending around Rs.172.88 lakhs towards CSR in R.R Nagar unit. • Rs.21.96 lakhs was spent in year 2015 – 2016 for CSR activities of lease area of Melavenkateswarapuram Limestone Mine alone. • Well planned CSR activities are will be continued in future also. M/s. The Ramco Cements Limited, Management will allot Rs. 20/- Lakhs per Annum exclusively for the CRS activities, in and around the villages.
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The meeting came to an end with thanks expressed by the District collector to all the participants.

7.3 RISK ASSESSMENT:

7.3.1 Risk analysis and control measures:

Risk assessment is a process whereby risks are analysed, assessed and risk management priorities are evaluated. It is defined as the characterization of the potential adverse effect to human health & environment due to environmental hazards.

Objectives of risk assessment are:-

- Identifying hazardous activities
- Assessment of risk level and severity in different operations
- Identification of control measures
- Setting monitoring process
- Reduce the impact of mishaps of all kinds
- Reduce the inherent potential for major accidents

Methodology of Risk assessment:-

- Collection of information & identification of hazard
- Classify their severity and probability of occurrence
- Identification of exposed risks
- Assess the risk and risk rating based on
 - Probability
 - Exposure
 - Consequence
- Prioritization of the risks
- Implementation of control measures
- Monitoring risk assessment
- Evaluation and correction

Factors of risks involved due to human induced activities in connection with mining operations are 1) removal of O.B and side burden 2) drilling 3) blasting 4) excavation of ore and 5) transportation of ore.

Other risk factors due to natural activities are 1) fire 2) water inundation 3) electricity and 4) natural calamities.

For the various risks, likely to arise, as above, detailed analysis of causes and control measures is given in below:

S.No	Factors	Causes of risks	Control measures
1	Removal of O.B	a) Top soil & O.B bench may slide due to its unconsolidated nature. b) Vibration due to movement of vehicles in the O.B benches .	- Over all O.B bench slope angle will be maintained not more than 45° - Bench width will be 1.5 times more than the Bench height
2	Drilling	a) Due to high pressure of compressed air hoses may burst b) Jack hammer rod may break due to improper maintenance of the rod	- Periodical preventive maintenance and replacement of worn out accessories in the compressor and drill equipment - As per manufacturers recommendation rod to be replaced and bits will be changed
3	Blasting	a) Fly rock, ground vibration and noise etc., b) Improper charging of explosives	- Burden and spacing will be kept optimum on trail basis. - Explosive charge per delay will be minimized. - Shock tube detonating system and Non Electric surface blasting system is practiced which reduces vibration levels, improves heaving, improves fragmentation of rocks and also reduces fly rocks, etc. - Delay detonators will be used
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 unauthorised 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

7.3.2 Disaster Management Plan:

The complete mining operation is carried out under the management control and direction of a qualified mine manager holding a First Class Manager's certificate of competency.

The DGMS have been issuing a number of standing orders, model standing orders and circulars to be followed by the mine management in case of disaster, if any. Moreover, mining staff is being sent to refresher courses from time to time to keep them alert. However, following natural/industrial hazards may occur during normal operation.

- Inundation of mine pit due to flood/excessive rains :
- Slope failure of the pit and waste dumps
- Accident due to heavy mining equipment and
- Blasting and use of Explosives

In order to take care of above hazard / disasters the following control measures have been adopted.

- Checking and regular maintenance of garland drains and earthen bunds to avoid any inflow of surface water in the mine pit.
- Provision of high capacity standby pumps with generator sets with sufficient quantity of diesel for emergency pumping especially during monsoon.
- All safety precautions and provisions of metalliferous mine regulation 1961 is strictly followed during all mining operations
- Entry of unauthorized persons is prohibited.
- Firefighting and first-aid provisions in the mines office complex and mining area are provided.
- Provisions of all the safety appliances such as safety boot, helmets, goggles, dust masks, ear plugs and ear muffs etc. are made available to the employees for their use.
- Training and refresher courses for all the employees working in hazardous premises
- Observance of all safety precautions for blasting and storage of explosives as per MMR 1961.
- Working of mine, as per approved plans and regularly updating the mine plans
- Cleaning of mine faces is regularly done

- Regular maintenance and testing of all mining equipment as per manufacturers guidelines
- Suppression of dust on the haulage roads with frequent water sprinkling, etc.
- Increasing the awareness of safety and disaster through competitions, posters and annual safety weeks and environmental weeks, encouraged through suitable rewards and other similar drives.

The management is able to deal with the situations efficiently keeping in view of the likely sources of dangers in the mine.

7.3.2.1 STRUCTURE OF DISASTER MANAGEMENT PLAN:

The structure of the DMP is described below.

7.3.2.2. OUTLINE OF DISASTER MANAGEMENT PLAN:

The purpose of disaster management plan is to restore the normalcy for early resumption of mining operation due to an unexpected, sudden occurrence resulting to abnormalities in the course of mining activity leading to a serious danger to workers or any machinery or the environment.

7.3.2.3. SYSTEM OF COMMUNICATION:

Having an internal communication system for the department head and to their line of command is essential. The telephone Nos. and addresses of adjoining mines, rescue station, police station, fire service station, local hospital, electricity supply agency and standing consultative committee members are to be maintained by the incharge of the first aid room.

7.3.2.4. CONSULTATIVE COMMITTEE:

A standing consultative committee will be formed under the head of Mines manager. The members consist of safety officer/medical officer (full time or part time) /Asst.manager (designated as in charge of environmental management & pollution control) / public relation officer/foreman. This team prepares the emergency plan.

7.3.2.5. EMERGENCY PLAN:

The emergency plans, adopted and to be adopted to deal with any emergency situation are described below:

Organization Plan:

Organization plan includes a clear statement on the line of command and the responsibilities of each person involved in case of emergency situation.

Equipment Plan:

Equipment plan includes clearly stipulating make and type of machinery, capacity of machinery, location of operations and field of operations. Emergency plan includes Emergency Preparedness Plan and the standing orders will be prepared and displayed at all conspicuous places.

Functions of the emergency consultative committee:

1. The team shall meet once in six months to discuss the possible or probable causes/ instances leading to any disaster that may occur in and around the mines.
2. The team shall assess the required resources to deal with the situation that may be identified as above.
3. The team leader shall lay down a detailed procedure or oral information to each member to follow in case of any impending or possible or actual disaster.
4. The team shall conduct mock drill once in a year to understand the practical problems that may arise while implementing the Emergency Preparedness Action Plan including the response time and take necessary steps to make the system effective.
5. The team shall make necessary recommendations/suggestions to the Management for identifying / monitoring/ dealing with any possible or probable disaster.
6. The minutes of the meeting of team shall be prepared including the probable cause of incident, response time and corrective and preventive actions required to be taken to avoid the reoccurrences of the same and kept as record.
7. The team may draw an Action Plan and modify the same from time to time based on changed circumstances.

8. The Emergency Preparedness team shall come into action immediately in case of any disaster by establishing the control room at an appropriate place nearer to the affected area.
9. The team shall record the actual performance/procedure followed/short comings while dealing with any actual disaster which will be discussed at various levels to strengthen the plan and approach.
10. Mines Manager shall inspect all the places where disaster occurred, along with Emergency Preparedness Team to give further instructions.
11. Mines Manager shall ensure that all affected places are safe to resume the normal works and then only shall give permission to start the operations.

Facilities and Accommodation:

Accommodation and facilities for medical centre, rescue room and for various working groups will be provided. Regular checking of these facilities shall be under taken by the Asst.Manager.

First Aid and Medical Facilities:

The mine management is having first aid / medical centre for use in emergency situation. All casualties would be registered and will be given first aid. The centre will have facilities for first aid and minor treatment resuscitation, ambulance and transport. It will have proper telephone/wireless set for quick communication with hospitals where the complicated cases are to be referred. Regular checking of these facilities shall be under taken by the doctor and the incharge of the first aid room.

Store and Equipment:

A detailed list of equipment available, its type and capacity and items reserved for emergency will be maintained by the foremen and Asst.Manager.

Transport Services:

A well-defined transport control system will be provided to deal with the situation. Foremen shall be made incharge for these services.

Functions of Public Relations Group:

It is essential to keep cordial relation with government officials and other social service organization and working groups. Liaison with representatives of the mine workers is required to

ameliorate the situation of panic, tension, sentiments, grievances and misgivings created by any disaster. Management is required to ameliorate the injured, survivors and family members of affected persons by providing material, finance, moral support and establishing contact with relatives of victims. The consultative committee formed, especially the nominated public relation officer shall look into these aspects.

Security:

Manning of security posts is very essential during the disaster management. This shall be undertaken by the foremen.

Catering and Refreshment:

Arrangements are to be made for the victims, rescue teams and others. The nominated public relation officer shall look into these aspects.

Care and Maintenance during Temporary discontinuance:

If the mine is 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 mine from the surface will be prevented by providing security guards and fencing arrangements. The mines manager shall take all the steps required for the care and maintenance during temporary discontinuance.

7.3.2.6 Executorial procedures for emergency plan:

The following procedural methodologies will be adopted for proper execution of emergency plan.

- On realizing anything serious occurrence happened anywhere in the mine, immediate information has to be passed on to the nearest available mining official and the mine management.
- On being informed about the emergency it will be verified for its correctness by the mining official who will telephone in particular to the Manager and supervisors of other parts/operations of the mine and managers of adjoining mine so that persons may be withdrawn.
- On receiving information of emergency intimation, it will be sent to the consultative committee, already formed by the mines manager. The mines manager shall also inform about the disaster to the police, nearest office of mines

safety, office of pollution control board, District Collector in charge of emergency plan of the district and other required statutory bodies of State and Central Government. Shift in-charge will ensure that all the materials and transport system to deal with emergency situation are made available at the site.

- First aid facilities and ambulance to be made ready for providing to the victims. The Doctor should be immediately called upon.

In case of likelihood of any possible risks or disasters, pertaining to the mine workings such as inundation consequences, etc, spreading to outside peripheral areas, an “Off-site Emergency Plan” has to be properly planned and documented in consultation with Collector, Thoothukudi District and other concerned Government Officials. In case of any unfortunate happening of an emergency in off-site areas, prompt execution of various action plans as laid down in the offsite Emergency plan has to be carried out with the help of the concerned Government officials and local people.

7.4 MINE CLOSURE PLAN:

7.4.1 General:

Mine closure has been planned on a progressive basis concurrent with the ongoing mine operations so that necessary financial outlays are also incurred partly. This will regulate the monetary needs for closure on a progressive basis.

7.4.2 Economic and social repercussions of mine closure:

These factors are profiled below.

7.4.2.1 Retrenchments:

Does not arise, since the proposal is for progressive mine closure plan. After closure the manpower will be shifted to the other mines of the same organization or their other business.

7.4.2.2 Compensation given to employees on permanent roll:

For the employees in our permanent roll, they will be given alternate employment for the sustenance of themselves and family members even if this mine is closed.

7.4.2.3 Connected satellite occupations:

Auto Workshops have come up in the village nearer to the mine to attend the break down / repair work on private trucks / tippers. Nearly 30 persons are working in the workshops. Since the Auto Workshops are situated on the NH 45-B, these workshops not only attend the break down / maintenance work on contract vehicles which are being used in the mines but also

to the vehicles plying on the NH 45-B. Hence the running of the workshops will not be affected even after the mine is closed.

7.4.2.4 Societal expectations and repercussions:

There will not be any major repercussions on the expectations of society around the mine due to closure. In fact, there are positive impacts like direct and indirect employment due to this mine. People around are getting good educational facilities and medical facilities due to our schools and dispensary.

7.4.2.5 Progressive reclamation Plan:

7.4.2.5.1. Mined-Out Land:

At the commencement of the year 2014-15 no mineral bearing area is exhausted within the mining lease. The mined out land will be available for backfilling only at the beginning of 2023 onwards i.e during the conceptual period

No reclamation is proposed during the remaining period of the scheme period.

During the remaining 3 years of the scheme period a total of 2.16 Mil.tonnes of ROM limestone (1.50 Mil.t of clean limestone) and 3.89 Mil.tonnes of waste are proposed to be generated. The waste generated will be dumped in the suitable ear marked places.

Reclamation of the worked out pit by way of backfilling will be carried out during the conceptual period. The waste dumps will be stabilised by suitable afforestation techniques. Reclamation will be carried out by backfilling the part of western block (Eastern side of western block) over an area of 3.897Ha. Part of the pit 3.44 Ha will be left as water reservoir and remaining part of 17.633 Ha will be covered by bench plantation. In the eastern pit 2.50Ha will be left as water reservoir and 14.25Ha will be covered by bench plantation.

Hence at the end of life of mine, an extent of 3.897 Ha will be refilled, about 5.95 ha will be left as water reservoir and the remaining area of 31.87 Ha will be under bench plantation.

The area that will be backfilled is as follows

S.No	Period	Location	Area(In ha)
1	Conceptual period from 2023 onwards	Eastern side of western pit between ML – 12.4 to ML - 15	3.897
	TOTAL		3.897

The area that will be left as water reservoir is as follows

S.No	Period	Location	Area(In ha)
1	Conceptual period from 2023 onwards	Between ML – 1 to ML - 10	3.44
2	Conceptual period from 2028 onwards	Between ML – 16 to ML - 20	2.50
	TOTAL		5.94

- Green belt over an area of 14.13 Ha will be carried out along mine periphery, virgin area and along the mine hauling roads.
- Afforestation will be carried out in the backfilled area of 3.897 Ha, besides bench plantation of 31.87 ha will also be taken up in the post operational period.
- About 16.72 Ha of external dump will be afforested after stabilizing with local species by suitable afforestation techniques.
- Backfilling will be carried out up to the original ground level.
- Part of the worked out area will be left as water reservoir and it will be properly fenced to avoid un-authorized entry in to the pit.

7.4.2.6 Abandonment cost:

This does not arise since the proposal is for progressive closure. The board activities that area involved in abandonment of the mine are:

- Refilling
- Reclamation
- Afforestation
- dismantling, maintenance and monitoring program

Afforestation activities are carried out simultaneously with mining protection, maintenances and monitoring program is also done simultaneously and also will go on envisaged cost for various activities of abandonment of mine.

The abandonment cost will be discussed in the final closure plan and is not applicable for the present.

7.4.2.7 Financial Assurance:

The extent used for mining and allied activities during the plan period is given below

SI No	Head	Area put on use at start of plan (Ha)	Additional requirement during plan period (Ha)	Total (Ha)	Area considered as reclaimed fully & rehabilitated (Ha)	Net area considered for calculation (Ha)
1	Area of excavation	20.35	4.62	24.97	Nil	24.97
2	Storage of top soil	1.03	2.67	3.70	Nil	3.70
3	Overburden/dump	2.95	7.38	10.33	Nil	10.33
4	Mineral Storage	-	Nil	Nil	Nil	Nil
5	Infrastructure(Works hop / Building)	0.05	0	0.05	Nil	0.05
6	Roads	0.20	Nil	0.20	Nil	0.20
7	Railways	-	Nil	Nil	Nil	Nil
8	Green belt	2.90	1.40	4.30	Nil	4.30
9	Tailing pond	-	Nil	Nil	Nil	Nil
10	Effluent treatment plant	-	Nil	Nil	Nil	Nil
11	Mineral Separation plant	-	Nil	Nil	Nil	Nil
12	Town ship area	-	Nil	Nil	Nil	Nil
13	Others	2.20	0.20	2.40	Nil	2.40
GRAND TOTAL		A	B	C=A+B	D	E=C-D
		29.68	16.27	45.95	Nil	45.95
Unused area		68.94		52.67		52.67
Grand Total		98.62		98.62		98.62

As per Mineral Conservation and Development (Amendment) Rules – 2003 under Rule 23 (F) the lessee will have to provide financial assurance of Rs.25,000 / ha for the area utilized since the area falls in A-Category mine. The financial assurance for 45.95 Ha works out to Rs.1148750/- (Rupees Eleven lakhs forty eight thousand seven hundred and fifty only). Financial Assurance in the form of Bank Guarantee has been submitted to Indian Bureau of Mines.

CHAPTER – VIII

PROJECT BENEFITS

The working Melavenkateswarapuram Limestone mine of TRCL has brought about transformational prosperity and improvements in physical and social infrastructures in the area like:

- Direct employment to about 46 persons
- Indirect employment to more than 200 persons
- Improvements in infrastructure in the area like Provision of drinking water supply, approach road etc to nearby villages.
- Financial gains for the state and central governments, through collection of various taxes like royalty, cess, central excise/VAT by sale of cement , etc
- Improvement of Educational Facilities in the Surrounding Area.
- Increase in General Awareness of the People.
- Increase in Competitive Spirit Among Youths
- Improvement of the General Living Standard of the People in the Vicinity
- Overall Improvement in HDI (Human Development Index)
- Growth of Allied Industries in the Area.
- Generation of self-employment through self-help groups.
- Reduction in migration of local people and at the same time increase in Inflow from outside.
- Improvement in Per Capita Income.
- Providing certain facilities for the local schools and panchyats

In short, the working mining project has benefitted this region in the fields of potential employment opportunities, improved per capita income for local people, improved social welfare facilities in respect of education, medical healthcare systems, communicational aspects, infrastructural build-up, etc.

The project proponent has already incurred an expense of Rs.7.80 crores during the year 2014-15 towards 'CSR' activities as stated in para 4.7 in Chapter IV earlier. For future need-based CSR activities, Rs.20 lakh each year from Melavenkateswarapuram mine lease is earmarked by TRCL to improve the social and physical infrastructures considerably in this backward rural area.

CHAPTER – IX

ENVIRONMENTAL MANAGEMENT PLAN

9.1 INTROUDCTION:

For the present working Melvenkeswarapuram mine, good practices of Environmental Management plan are ensured to keep all the environmental parameters of the project in respect of ambient air quality, water quality, socio-economic improvement standards, biological quality of the area, etc, well within statutory sustainable limits prescribed by CPCB, MOEF&CC and SPCB. Regular periodical returns on above aspects, as required by them, are being furnished regularly.

9.2 ENVIRONMENTAL MANAGEMENT PLAN:

9.2.1 Brief:

In future also, well planned and systematic monitoring systems and well-conceived and efficient Environment Management Plan will be continued promptly and attentively to ensure that during the project operations, the various environmental parameters, as described above, are well within the statutorily sustainable limits. Its details are briefly given below:

9.2.2 Air Quality:

Frequent water spraying and sprinkling is being and will be done in areas of OB dump formation, along haul roads and other dust generation areas. The ore stack yard will be wetted frequently for fugitive dust suppression.

Elaborate green belt cover is already developed and will be further created along with roads, around mine periphery, around OB dumps, etc. as described in Chapter-IV. Overloading of dumpers, etc, will be avoided to stop spillages. Good preventive maintenance will be practiced in case of HEMM to reduce gaseous pollutants.

9.2.3 Water Environment:

Various mitigative measures practiced and planned to be continued in this respect will include following:

- ❖ Provision of settling ponds to collect mine discharge waters to settle suspended solids, etc,
- ❖ Desilting of settling ponds will be done regularly

- ❖ Construction of garland drains around open pit areas, stock yard, OB dumps, etc.

Further details are given in this respect in Chapter-IV.

9.2.4 Noise Environment:

Control measures adopted and to be continued is as follows:

- ❖ Noise protectors, insulation of operator cabins, installation of silencers in machineries, etc.
- ❖ Provision of ear plugs to workers in higher noise prone areas, etc.
- ❖ Provision of adequate green belt around mine areas, along roads, etc. to prevent noise propagation. More details in this connection are given in Chapter-IV.

9.2.5 Biological Environment:

Good green belt cover as described in Chapter-IV, has been and will be created in various areas around mine, OB dumps, along roads, etc. to boost the biological, visual and aesthetic outlook of the area. The green belt plans are furnished in paras 4.6.5 and 4.6.6 in Chapter IV.

9.2.6 Socio-Economic Environment:

The ongoing project operations have already bestowed positive impacts in the region on the employment arena as well as on physical and social infrastructural status. Many other tangible benefits have been gained by the local people in the surrounding areas due to ancillary units, trading operations, contractual needs, casual labor, green belt development, etc. Financial gains have also been derived by Panchayats, State and Central Governments due to collection of royalties, cess / VAT, taxes, etc. Under their CSR programmes the project proponent has already spent about Rs. 7.80 Crores during the year 2014-15 for providing various services to local community as mentioned in para 4.7 in chapter IV earlier.

Various facilities in the area will be further improved in great measure in different spheres like education, medical health care, infrastructural development, communication, drinking water supply, vocational training, etc. after enhancement.

Elaborate details in this respect are given in chapter -IV.

9.3 ENVIRONMENTAL MONITORING AND ADMINISTRATIVE ASPECTS:

A properly planned post-project environmental monitoring schedule forms an essential part of the Environmental Management Plan of a project and has a vital role in its success. In this project, environmental monitoring is accorded a prime position, details of which are given in chapter -VI, along with its organizational structure, monitoring schedule, Cost structure etc. The prime objectives addressed under environmental monitoring include

- ❖ Monitoring pollutant discharges from the project within standard limits set by MOEF&CC / CPCB/SPCB.
- ❖ Assessment of environmental impacts continuously, which ensures effectiveness of mitigation measures during operational stage, with maintenance of proper records for each division of the project.

The action plan for monitoring consists of monitoring of following environmental components.

- ❖ Ambient air quality comprising fugitive and gaseous components.
- ❖ Quality of liquid effluents from the project.
- ❖ Ground water quality and behavior.
- ❖ Ambient noise levels in mine area and vicinity
- ❖ Monitoring of green belt cover growth and assessing survival rates especially in the initial three years of plantation
- ❖ Monitoring of occupational health of staff and workers once a year for routine checking of diseases like bronchitis, asthma, tuberculosis, eye diseases, etc. and for taking prompt action immediately if warranted.
- ❖ Monitoring of socio-economic profiles of areas surrounding the project for assessing any deficiencies and departures from planned objectives for service deliveries and to make up these deficiencies immediately. This assessment will be done once in 5 years.

9.4 ENVIRONMENTAL MONITORING AND MANAGEMENT DIVISION:

The environmental monitoring and management cell, as detailed in chapter -VI, shall oversee and implement meticulously various functions as detailed below to ensure that the environmental status of the area remains well within the statutory standards of MOEF&CC/SPCB, etc.

- ❖ Monitoring pollutant discharges from the project within standard limits set by MOEF&CC/ CPCB/SPCB.
- ❖ Assessment of environmental impacts continuously, which ensures effectiveness of mitigation measures during operational stage, with maintenance of proper records for each division of the project.
- ❖ Compliance to Statutory regulations and requirements by sending necessary periodical returns to authorities, etc.
- ❖ Providing environmental management information to top management
- ❖ Carry out pro-active environmental studies and observe all precautions necessary to avert disasters and emergencies in the project operations as well as nearby areas.
- ❖ All firefighting equipments, etc, will be kept in 'ready- to – fight' status to deal with emergencies.
- ❖ Undertake relevant ecological impact studies.
- ❖ Undertake occupational health surveys as scheduled
- ❖ Fugitive dust control system monitoring
- ❖ Liquid discharge monitoring, Ground water quality and behavior.
- ❖ Ambient noise level monitoring
- ❖ Management of waste disposal system
- ❖ Horticulture and green belt development
- ❖ Conducting regular environmental audits.
- ❖ Conducting regular training programmes on various environmental requirement, especially for fire-fighting, etc.
- ❖ Monitoring of occupational health of staff and workers once a year for routine checking of diseases like bronchitis, asthma, tuberculosis, eye diseases, etc. and for taking prompt action immediately if warranted.
- ❖ Monitoring of socio-economic profiles of areas surrounding the project for assessing any deficiencies and departures from planned objectives for

service deliveries and to make up these deficiencies immediately. This assessment will be done once in 5 years.

9.5 CONCLUSION:

A meticulously well planned Environmental Management Plan, with various programme schedules and timely execution objectives, as above, will ensure that the future environmental quality in the area will be maintained within statutory limits.

The environmental management strategy as explained above will prove that industrial growth, if properly planned with all environmental concerns and appropriate remedial measures can go a long way to improve life pattern and living conditions of the local community around the project.

CHAPTER X

SUMMARY & CONCLUSION

10.1.1 GENERAL:

M/s The Ramco Cements Limited – TRCL (Erstwhile Madras Cements Ltd.,) a flagship company of Ramco Group of Industries in southern India, has cement units in Tamil Nadu, Andhra Pradesh and Karnataka States. Limestone needs of these plants are mostly met by nearby captive limestone mines. TRCL is presently producing 14.45 MTPA cement from its different cement units situated in Tamilnadu, Andhra Pradesh and Karnataka.

M/s. The Ramco Cements Limited (TRCL) is operating a cement plant with 2.0 MTPA capacity at Ramasamyraja Nagar in Virudhunagar District of Tamil Nadu.

The raw material for this cement plant is met from the following mines:

- Melavenkateswarapuram mines (MV Puram)
- Pandalgudi
- Maravarperungudi
- Sivalarpatti

The Limestone from Sivalarpatti and Pandalgudi deposits is marginally above cement grade and the Maravarperungudi and Melavenkateswarapuram deposits are of low grade. In order to meet the quantitative and qualitative requirements all the four mines are operated simultaneously.

Melavenkateswarapuram limestone mine is in operation since year 1985 and is presently worked at a planned capacity of 0.101 MTPA.

However due to quality constraint in the limestone of the region, the limestone consumption in the cement plant has increased. To meet this additional requirement, now it is proposed to expand the mine production capacity from Melavenkateswarapuram limestone mine from the present 0.101 MTPA to 0.50 MTPA capacity (0.726 MTPA of ROM).

Under the above circumstances TRCL has initiated action towards obtaining environmental clearance for this expansion project.

10.1.2 STATUS OF LEGISLATORY APPROVALS:

- Initially mining lease was granted for the area of 103.53 Ha for a period of 5 years vide G.O.Ms.No.1033 dated 28.07.1982 and the lease deed was executed on 29.07.1983. Subsequently, the same lease was extended for periods of 20 years from 29.07.1983 vide G.O.Ms.No.497 dated 23.03.1988 and lease deed for the same was executed on

23.03.1988. The mining lease is valid upto 28.07.2003 and the renewal application applied vide our letter dated 22.07.2002. The same was renewed vide G.O.(Ms).No.168 dated 17.11.2014 for a period of 20 years (from 29.07.2003 to 28.07.2023) for an area of 98.62 Ha as against the earlier granted lease area of 103.53 Ha, (for which renewal was sought), after excluding 4.905 ha of land comprising 0.275 ha of poramboke land and 4.63 ha of patta dry land **(Refer Annexure - 1).**

- As per MMDR Amendment Act, 2015 the Mining Lease is valid up to 28.07.2033. [Clause 8A(3) & 8A (5)]
- Scheme Of Mining and Progressive Mine Closure Plan for the scheme period 2013-2014 to 2017-2018 for the enhanced limestone production capacity of 0.50 MTPA approved vide IBM letter no TN/TKD/LST/MS-808-SZ/714 dated 06.06.2013. However, because of change in Extent, Modified Mine plan was prepared for 98.62 Ha and the same was approved vide Letter TN/TKD/MP/LST-1949MDS dated 20.05.2015. **(Annexure – 2).**
- Environmental clearance obtained from Ministry of Environment & Forest vide their letter No-J-11015/6/99-IA-II(M) dated 22.11.1999 for Melavenkateswarapuram mines expansion from 1,01,500 TPA from the 103.53 ha of lease area to 4,06,300 TPA involving additional lease area of 150.10 ha. (i.e. 1,01,500 TPA from the 103.53 ha of Melavenkateswarapuram limestone mines and additional 3,04,800 TPA from Sivalarpatti Mines of 150.10 Ha) **(Annexure – 3)**
- Subsequently, amended EC for Sivalarpatti limestone mine expansion from 0.304 MTPA to 0.69 MTPA was obtained from MOEF&CC vide letter No. J-11015/192/2005-IA.I(M) dated 9.1.2007.

EC for expansion of Melavenkateswarapuram limestone mines from 1,01,500 TPA to 0.50 MTPA for the lease area of 103.53 ha was initially applied. The TOR for the same was obtained vide J-11015/136/2013-IA.II (M) dated 09.09.2013 **Refer Annexure - 4.** Due to the reduction in lease area from 103.53 Ha to 98.62 Ha during the lease renewal, the lessee has applied for amendment in the TOR for the revised extent of 98.62 Ha and hence the revised feasibility report and Terms of Reference is also submitted as per MOEF&CC requirement. Then the amendment in TOR for the reduced Mine lease area of 98.62 ha was obtained vide J-11015/136/2013-IA.II(M) dated 12.06.2015. **(Annexure - 5).** And extension for validity of amended TOR also obtained vide J-11015/136/2013-IA.II (M) dated 17.09.2015, which is extended upto 08.09.2016 **(Annexure – 5A).**

Other Approvals

- Consent order from TNPCB which is Valid upto 31.03.2017 (**Annexure – 6**). Further renewal applied.
- Copy of explosive license. (**Annexure – 7**)
- Environmental Statement Form-V (**Annexure – 8**)
- Latest Certified compliance for the EC obtained from MOEF&CC – Regional office vide letter no EP/12.1/173/TN/0590 dated 12.04.2017. (**Annexure – 9**)
- Although this block comes under safe zone, application to PWD is already made for Ground Water Clearance (**Annexure - 10**)
- Compliance status for consent to operate order of TNPCB (**Annexure - 11**)
- No Forest Land Certificate from Forest Department (**Annexure – 16**)
- Certified Pea fowl conservation plan (**Annexure – 17**)

TOR for this project has been conveyed by MOEF&CC, New Delhi, vide their letter No. J-11015/136/2013-IA.II (M) dated 9th September 2013 and amendment in the TOR for reduced Mine lease area from 103.53 Ha to 98.62 ha was obtained vide J-11015/136/2013-IA.II(M) dated 12.06.2015. And extension for validity of amended TOR also obtained vide J-11015/136/2013-IA.II (M) dated 17.09.2015, which is extended upto 08.09.2016.

The Draft EIA/EMP report for the enhanced production capacity is prepared in conformity with the conditions laid down in TOR and the generic pro-forma prescribed by MOEF&CC in their notification of September 2006 for based on **Winter season (Dec 2013 – Feb 2014)** data collection.

Then the draft EIA/EMP report was subjected to public hearing / Consultation Process on 25.02.2016 at T.R.Subbaraj Kalyana Mahal, Paralachi Road, Pudur, Villathikulam Taluk, Thoothukudi District through District Collector -Thoothukudi, District Environmental Engineer - Tamil Nadu Pollution Control Board along with the representatives from M/s. The Ramco Cements Limited, the consultants, press fraternity and the public after following mandatory procedures.

This **Final EIA/EMP report is prepared incorporating the public hearing proceedings.** The elaborate details of public hearing along with proceedings and minutes of Public Hearing are furnished in **Para 7.1 in Chapter-VII and Annexure - 15.**

10.2 BRIEF PROJECT PROFILE:

S.No	PROJECT PROFILE & SALIENT ASPECTS	
1.	Name of the Project	Melavenkateswarapuram Limestone Mines
2.	Project Proponent	M/s The Ramco Cements Limited. "Auras Corporate Centre" V Floor, 98-A Radhakrishnan Road, Mylapore, Chennai -600 004. Pho No- 044 - 28478666 , 28478656 Fax no.: 044 – 28478676. Email: ms@ramcocements.co.in
3.	ML area	98.62 Ha
4.	Location & Approachability	Project Site is Located in Pudur, Nadukattur and Sennayampatti villages, Vilathikulam Taluk, Thoothukudi District, Tamilnadu State. The mine site is well connected and is at a distance of 0.50 km east of Pudur – Melavenkateswarapuram road which in turn is connected to NH – 45(B).
5.	Toposheet No And Latitude & Longitude	Latitude N9 ⁰ 17 31.5 - N9 ⁰ 18 08.1 Longitude E78 ⁰ 09 48.7 - E78 ⁰ 11 04.0 Survey of India Toposheet No.58 K / 3
6.	Land use	About 97.82.5 ha of land are private land owned by lessee & the remaining 0.795 Ha is Government land and in TRCL's possession.
7.	Production Capacity	726950 MTPA of ROM / annum of which clean limestone will be 500000 tonnes / annum (0.5 MTPA)
8.	Mine site topography	53 to 60 above MSL
9.	Nearest Road	Pudur-Melavenkateswarapuram road
10.	Nearest Railway station	Virudhunagar – 50 km
11.	Nearest Airport	Madurai – 75 km (from the mines)
12.	Nearest major water bodies	Uppu Odai – 5 km

13.	Nearest villages	Melarunachalapuram – 1.0 km (N)
14.	Geological reserves	9496199 T
15.	Mineable reserves	7409807 T
16.	Waste management, Backfilling & reclamation	<p>It is estimated that around 18.19 million tonnes of side burden waste and interstitial reject will be generate till the life of the mine in both the blocks. Out of the above 9.71 million tonnes of developmental waste generated will be used for external dumping and road/bund formation in western block, (Out of 9.71 Mil.T, about 8.25 Mil.T will be dumped Southern side of eastern block along ML – 4.5 to ML – 10 and the rest 1.46 Mil.T will be utilised for road and bund making along mine periphery). The rest 8.47 Mil.T of development waste from Eastern block will be utilized for refilling the worked out pit between ML 12.40 to 15.00 (western pit) upto the surface after exhausting all the reserves in the western pit area. The total area reclaimed by refilling will be 3.897 Ha.</p> <p>The area between ML 1.0 to 10.00 & 16.00 – 20.00 will be left as water reservoir. An area of 5.95 Ha will be left as water reservoir.</p>
17.	Method of mining	Open Cast fully mechanized – Drilling and Blasting
18.	Bench Height & width	Height – 9m, Width – more than the height of the bench
19.	Depth of mining	Western block upto -10 RL & Eastern block upto 0 RL
20.	Blasting	Latest Blasting techniques like NONEL, Electronic System of Initiation system to maintain charge per hole and charge per delay as the same. By adopting such advanced practices in blasting we are controlling PPV well within the norms of 10 mm/sec.
21.	Life of the mine	About 12 years
22.	Mineral beneficiation	Segregation and removal of impurities in the mine face

		after blasting, screening, removal of finer weathered gneiss after screening, crushing,, screening, magnetic separation for further removal of impurities
23.	Man power	Direct – 46 & Indirect - 200
24.	Water requirement & Source	The total present water requirement for the Melavenkateswarapuram limestone mines is about 50 m ³ /day. No additional water is required after expansion. The exhausted Mine Pit between ML - 1 and ML – 4 in Pandalgudi Mines at distance - 8.8 km (NW) is kept as a reservoir and is being utilized for other captive mines also.
25.	Site services	Facilities like mines office, canteen, first aid centre, etc are available. The existing infrastructural facilities such as road, power line, building, and water supply sources etc will be suitably upgraded and utilized after expansion also. Well-developed work shop, stores of adjacent Pandalgudi limestone mine will be used for this mines also.

10.3.0 EXISTING ENVIRONMENTAL SCENARIO:

10.3.1 GENERAL:

Base line environmental data for various Environmental components were collected in the study area systematically and meticulously as per relevant IS codes, CPCB, MOEF&CC guidelines and as per approved TOR during Winter season (Dec 2013 – Feb 2014). For the purpose of this study, the area has been divided into two zones, namely, core and buffer zones. The entire mine lease area 98.62 Ha represents the core zone, while buffer zone encompasses an area of 10 km radius distance from the periphery of core zone.

10.3.2 SOCIO-ECONOMIC STATUS:

10.3.2.1 Core Zone:

Mining operations in this lease area is in progress for the last 38 years. The lease area comprises a small part of government land and the remaining entire land is private land owned by the lessee. As such there is no population in the core zone or land losers.

10.3.2.2 Buffer Zone:

Melavenkateswarapuram limestone mine is situated in Vilathikuam Taluk, Thoothukkudi District of Tamilnadu state. Based on 2011 census, 37 rural villages including 1 town (V.Pudur) are falling within 10-km radius of this limestone mine. The demographic profile details are as follows:

The distribution of population is as below:

- Male - 30282 (49.70%)
- Female - 30616 (50.30%)
- Total - 60898
- Scheduled caste - 10644 (17.5%)
- Scheduled tribes - 6 (0.01%)
- Total literacy rate in the area - 70.9%

Male literacy rate is 39.2 % & Female literacy rate is 31.8% of the total Population.

The occupational structure of the area is as below:

- Total main workers - 28371 (46.6%)
- Male main workers - 16610
- Female main workers - 11761
- Total marginal workers - 6085 (10%)
- Total non-workers - 26442 (43.4%)

10.3.2.3 SAMPLE SURVEY:

In order to prepare a complete and comprehensive report, a few villages were visited for conducting sample Village survey containing questions on all socio-economic aspects, including questions on the aspirations and requirements of the people for a better living.

Apart from this, Focused Group Discussion (FGD) were conducted with leading opinion makers in the village in order to capture the overall scenario of the village including the aspirations and desires of the community in overall terms. The study details are given in Para 3.2.4, Chapter – III.

10.3.3 EXISTING ENVIRONMENTAL QUALITY:

- ❖ The micrometeorological study show that the temperature in the area during the study period ranged from 19.0°C to 42.0°C while the relative humidity varied between 28.0 % and 96.0%. The wind speed during the study period ranged from <1.8 to 20.4 Km/hr. The predominant wind direction is from NE.
- ❖ The ambient air quality data for PM₁₀, PM_{2.5}, SO₂, NO₂ and CO studied at 6 locations during Winter season show that the SO₂ levels in all the six studied locations

ranged from $<3.0 \mu\text{g}/\text{m}^3$ to $6.2 \mu\text{g}/\text{m}^3$. The NO_2 concentrations varied from $6.4 \mu\text{g}/\text{m}^3$ to $13.4 \mu\text{g}/\text{m}^3$. The PM_{10} levels varied from $45.4 \mu\text{g}/\text{m}^3$ to $86.6 \mu\text{g}/\text{m}^3$, $\text{PM}_{2.5}$ levels varied from $18.3 \mu\text{g}/\text{m}^3$ to $34.7 \mu\text{g}/\text{m}^3$. The CO values in the all locations found to be below detectable limit. Silica values in the study area are found to be below detectable limit. (Detection limit – $0.05 \text{mg}/\text{m}^3$) which is well within the prescribed limit of $5 \text{mg}/\text{m}^3$.

- ❖ The existing Ambient Air Quality levels for PM_{10} , $\text{PM}_{2.5}$, SO_2 & NO_2 are within the prescribed CPCB limits for “Industrial, Residential, Rural & other areas” and Co found to be below detectable limit in all locations.
- ❖ The ground waters in the 4 bore wells were found to be good. pH values were ranging in between 7.38 - 8.14. TDS values ranged between 263- 1542 mg/L, Chloride values were found to be 55.1 – 546.3mg/L, Total hardness values were ranging from 87.4 to 285 mg/L, Total alkalinity values were found to be 141.4 – 420.2 mg/L, Sulphate values were found to be 41.7 – 384.1 mg/L, Iron values were found to be BDL to 0.25 mg/L, Nitrate values were found to be 0.74 to 14.3 mg/l and Fluoride values found to be 0.8– 1.1 mg/L respectively.
- ❖ The water quality of ground waters were found to be within the prescribed IS: 10500 Norms for Drinking in the absence of an alternative source.
- ❖ In case of the mine pit water, the pH value is found to be 8.19. TDS and Chloride values were found to be 1930 mg/l and 479.8 mg/l respectively. Total hardness value found to be 712.5 mg/l, total alkalinity value found to be 260 mg/l , sulphate values were found to be 791.7 mg/l, Iron value found to be 0.01 mg/L, Nitrate value found to be 7.7 mg/L, Manganese value found to be less than 0.05 mg/L , Fluoride value found to be 1.27 mg/l, Total Suspended Solids Value found to be 2.0 mg/L, COD value found to be 96 mg/L, BOD value is found to be less than 27 mg/l. The pit water quality is found to be within the prescribed TNPCB Norms.
- ❖ Noise level measurement in the 6 locations show that the day, night equivalent of noise level in the core zone area (MVN1) are 56.0 dB(A), 42.8 dB(A) respectively which are below the work zone exposure limit of 90 dB(A). In the buffer zone, day Equivalent Noise (Leq-d) noise levels were ranging from 45.2 dB(A) to 49.9 dB(A) and night Equivalent Noise (Leq-d) levels ranged between 38.2 dB(A) to 39.0 dB(A). While comparing with the MOEF&CC Norm

of 55 dB(A) for day time and 45 dB(A) for night time, the monitored ambient noise levels were within the limit values for Residential areas.

- ❖ Soil samples collected from 4 locations show that the pH values were ranging between 8.59 – 8.84 and Electrical Conductivity values were ranging between 65.52 - 152 $\mu\text{S}/\text{cm}$. Soils are generally Silt loam type.

10.3.4 FLORA/FAUNA STATUS OF STUDY AREA:

10.3.4.1 FLORA:

CORE ZONE:

The ML area is mostly barren rocky ground. Therefore, there exists no specific flora & fauna within the ML area. There are small shrubs and trees in the area. The flora in the area is generally common variety of trees like *Prosopis juliflora*, *Accasia nilotica*, *Albizzia amera*, *Azadirachta indica* etc.

However, this scenario has changed with extensive greenery due to plantation programme of TRCL in and around the lease area to the tune of more than 10100 trees with dominant species like Neem, Eucalyptus, Naval, Tamarind, Teak, Aval Vagai, Mango, Guava, Kodikai, Nettiingam, Coconut, Pungai, Mangium, Casurina, Arasa, Murungai, Banana, Seetha, Vanni, Yellow Arali etc in and around the ML area.

BUFFER ZONE:

The region has vast stretches of fallow land, mostly dry land. The lands with dry scattered bushes and wild growth support goat rearing in the area. There are no forest areas within the buffer zone.

Limitation exhibited by soil condition also imposes certain constraint in landuse and hence, dry crop is predominantly seen. But in some places, near tanks and stream courses, paddy cultivation is also observed. Seasonal crops such as Ragi, Sorghum and gram varieties such as black gram, horse gram etc are grown along with fodder grass. Sunflower is also grown in some parts.

Trees like *Azadirachta indica* (neem), *Prosopis Juliflora*, *Acacia Sp*, *Moringa oleifera*, *Albizza sp*, *Cocos nucifera*, etc. are commonly seen.

The dominant shrubs consists of *Adhatoda vasica*, *Cassia auriculata*, *Calotropis gigantea*, *Datura metel*, *Lantana camara*, *Lawsonia inermis*, *Nerium oleander*, *Hibiscus rosa-*

sinensis Zizyphus Sp etc. The climbers consists of *Coccinia indica* , *Cissus quadrangularis* , *Abrus precatorius* and prominent herbs are *Acalypha indica*, *Sida cordifolia*.

The details are given in Para 3.7, Chapter – III.

10.3.4.2 FAUNA:

There is no Wild Life Sanctuary or National Park or Biosphere or Hotspots within the study area of 10 km. The fauna species found in the buffer zone are Hare, Three stripped palm squirrel. The avifauna found is Peafowl, Partridge, Parrot, Cuckoo, Owl, King fisher, Dove, Egret, Parakeets, Myna, etc.

Other than Peafowl there is no schedule – I species in the study area.

10.3.5 LAND ENVIRONMENT:

In the present study, remote sensing satellite data LISS IV of Resources at 2 acquired on 30th July 2013 has been used. Present study involves regional analysis of land use pattern showing 10 km buffer area, secondly changes in landuse pattern using temporal satellite data and lastly, landuse within the core zone of the ML area. This necessitates a careful analysis of satellite data adopting a well-defined methodology.

Land use and land cover (LULC) area in the buffer zone using satellite data is studied as 372.347 sq.km and spatial distribution of various LULC category show that about 79.29% of the area is fallow land and only 10.96% of the study area is crop land. Multi-temporal analysis comparing landuse pattern generated from temporal data (2009 and 2013) has brought out the dynamism of landuse units emphasizing the dependence of landuse on rainfall, with limited irrigational facilities available in the buffer area including groundwater resources.

10.3.6 HYDROLOGICAL STUDY:

A detailed hydrological study comprising Reconnaissance survey followed by groundwater monitoring was carried out and its details are elaborated in para 3.9, Chapter – III.

From the study it is found that within the mine pit, the ground water occurrence zones could be traced to the wetted surfaces on the freshly exposed mine faces at certain levels.

During the initial phase of mine excavation, ground water was intersected at about 12m depth with small quantity seeping in to the mine floor. But with deepening of the mine and formation of lower benches, this seepage gradually diminished and the next intersection of around water zone occurred in the limestone formations at depths of 25 to 28m. This seepage water from this zone is also not occurring for the entire length of the mine face and in the vertical section, this seepage is limited to certain depths and at certain longitudinal section in the exposed limestone bench. In the above hydrological scenario, the ground water zones in the

limestone are not homogeneous and non-isotropic with limited areal extent. Their vertical and horizontal continuity is also limited to the size, scale, length and width of the cracks.

A random geophysical resistivity survey conducted close to M. V. Puram site also indicates occurrence of more hard and compact nature at depths. Probably, the lower limestone beds below the present working level may be more compact, consolidated and hard than the upper zones. Hence seepage volume from these lower horizons should also be correspondingly less. Even as of now, the seepage volume from the limestone beds in the second and third benches is observed to be generally about 10 to 20m³/day. Hence even with deepening of the mine, the seepage quantum is expected to be within 20m³/day and may even get gradually reduced in flow quantum.

It is also observed that the water level in an observation located near the mine area, shows fluctuations of lower level in summer and higher level in the monsoon period.

Such seepage flow quantity finally flowing down to the mine floor at the deeper limestone formations is now observed to be varying between 60 and 80 m³/day.

Hence, this seepage flow of 60 to 80m³/day from contact zones together with earlier identified 10 to 20m³/day flow of seepage water from exposed limestone faces, results in around 90m³/day of total flow in to the mine pit and expected to remain same for further future depth conditions also.

The stage of ground water development of the block in which Melavenkateswarapuram mines is located is under 'SAFE' category.

10.4.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

10.4.1 GENERAL:

Opencast mechanized mining operation in Melavenkateswarapuram lease is in progress for past many years smoothly technically and efficiently so as to meet the limestone needs of TRCL's own captive cement plant situated close by at Ramasamy Raja Nagar.

The existing environmental status in the area is so far devoid of any adverse impacts due to the following reasons:

- Deployment of 10.0 KLD mobile water tanker for fugitive dust suppression in haul roads
- Periodical maintenance of plant & machinery
- All the internal roads are mostly made pukka
- Transportation of limestone from the mine to the Ramasamy Raja Nagar cement

plant through dedicated pukka road.

- 2 nos of settling / recharge pond has been constructed with the size of 90m x 50m x 3.0 m and 60m x 40m x 3.0 m dimension & Garland drains for a length of 1.2 km x 2 m x 2m to arrest siltation and channelizing storm run-off water.
- One settling / recharge pond proposed to be constructed with the size of 100m x 40m x 2.5 m after expansion
- Plantation of about 10100 saplings in and around Melavenkateswarapuram mines area. Good blasting practice with use of Latest Blasting techniques like NONEL, Electronic System of Initiation system to maintain charge per hole and charge per delay as the same
- Avoiding blasting by using Primary Breaker and secondary breaker wherever possible

This is amply supported by the fact that the regular monitored data of all the environmental components are within the permissible / acceptable limits.

Besides TRCL has established sound corporate environmental management system along with occupational health and safety management systems in all their mines and Cement plants.

However, due to expansion of mining activities there may be some additional impacts on various environmental attributes. As such, detailed impact assessment studies and planning of appropriate control measures have been undertaken for the proposed expansion project. Salient details are elaborately described below.

10.4.2 AIR ENVIRONMENT

Mining and allied operations may result in deterioration of air quality due to pollution arising from the project operation if appropriate measures are not taken. The principal sources of air pollution in the area due to mining and allied activities are:

Dust generation in the mine due to:

- a) Extraction of overburden and limestone.
- b) Movement of HEMM such as shovels dumpers etc.
- c) Drilling and blasting operation
- d) Loading and unloading operation
- e) Overburden & ore conveying
- f) Wind erosion of dumps

Besides, Gas emission can occur as a result of operation of diesel driven mining equipments, compressors, transporting vehicles, etc.

Particulate matter smaller than 10 microns, referred to as PM_{10} , can settle in the bronchi and lungs and cause health problems like Bronchitis, Emphysema, Bronchial Asthma, Irritation of mucus membranes of eyes, etc. Particles smaller than 2.5 micrometers ($PM_{2.5}$), tend to penetrate into the lungs and very small particles (< 100 nanometers) may pass through the lungs to affect other organs.

Besides, larger particles (greater than 10 microns in diameter) tend to settle to the ground by gravity in a matter of hours whereas the smallest particles (less than 1 micron) can stay in the atmosphere for weeks and are mostly removed by precipitation.

Impact on air quality due to fugitive emissions consequent to expansion was estimated based on the latest computer model – **ISCST (Industrial Source Complex Short Term Model)**.

Peak hourly incremental concentrations have been computed using hourly meteorological data and from the study it is observed that the peak incremental 24 hourly PM concentration under worst scenario works out to **$10.91\mu g/m^3$** that too near the source of pollution only.

In the existing mine workings, to avoid or eliminate airborne dust, development of extensive green barrier around mine, workshop, along roads, along periphery of mine, dumps, embankments, etc, avoiding overloading of dumpers, frequent water spraying / sprinkling on the roads, stock-piles, OB dumps and transfer points where dust is produced, wet drilling etc is ensured so that the impact on air quality due to this mining operation will not be appreciable.

Due to adoption of all these measures, no significant adverse impact on air quality has been observed. This is amply corroborated from the evaluation of the results of the regular environmental monitoring of air quality undertaken in the mine area and nearby villages.

By vigorous continuation of various above said mitigative measures, there will be no major impact on air quality due to this expansion project also.

10.4.3 WATER ENVIRONMENT

The total seepage water generation from the mine pit is $90\text{ m}^3/\text{day}$ out of which the maximum water requirement for the Melavenkateswarapuram limestone mines after expansion is $50\text{ m}^3/\text{day}$ which comprises $3.0\text{ m}^3/\text{day}$ for domestic sanitary needs, $47\text{ m}^3/\text{day}$ for dust suppression & green belt development and the remaining $40\text{ m}^3/\text{day}$ used for Recharge purpose. No additional water is required after expansion.

The exhausted Mine Pit between ML - 1 and ML – 4 in Pandalgudi Mines at distance - 8.8 km (NW) is kept as a reservoir and is being utilized for other captive mines also. TRCL has established water treatment plant in Pandalgudi to treat the mine water for drinking purposes for both colony and other mines work sites.

This being a mining project, there are no process effluent. Common workshop at Pandalgudi is used for this mine also and as such there will not be any workshop effluent from this lease area. There are no drainage courses near the mine lease and hence no impact on the surface water courses. The domestic effluents are treated through septic tank with soak pit arrangement.

The following mitigative measures are being implemented in the inactive waste dumps and these remedial steps will be enforced rigorously in future also to control the post-expansion water environment in the area, by making improvements appropriately.

- Providing dump tops with inner slopes and through a system of drains and channels, water will be allowed to descent into surrounding drains, so as to minimize the effects of erosion arising out of uncontrolled descent of water.
- The dump tops and sides of inactive areas will be progressively reclaimed with grasses and shrubs like Agave, Nuna, grasses to arrest and prevent erosion.
- Construction of garland drains of suitable size around mine area and external dump with proper gradients to prevent rain water descent into active mine area. Garland drains & sedimentation ponds have been made already to arrest siltation and channelizing storm runoff water. 3 garland drains, two along dump bottoms and one along lease boundary have been made which measure 1.2 km x 2m x 2m in all three cases.
- The material removed from the drain is dumped on the periphery and an earthen embankment / retaining wall is made to prevent any runoff or wash off from the dump reaching the nearby private lands.
- The garland drains are connected to two settling tanks of sizes 90m x 50m x 3.0 m and 60m x 40m x 3.0 m are created in lease area to collect surface runoff and mine water.
- One settling / recharge pond proposed to be constructed with the size of 100m x 40m x 2.5 m after expansion

- A safety distance of 10m will be left from the nearby private land on the western side and the toe of the dump and this area will be planted with local native species.
- It is proposed to leave a 50m barrier on the South western side from the dump toe to a small tank located just outside the lease. This area can also be planted with native trees.

Presently there is some seepage of water into the mine. The seepage water is being collected in the existing sump at the floor of the mine of adequate dimension considering the monsoon rainfall and the seepage quantity for other season. Water flowing during monsoon or regular seepage if any will be diverted to this mine pit sump by maintaining proper gradient on the bench floors and construction of water drains at the bench periphery.

Mine sump water conforming to discharging standards can be directly used for dust suppression on roads, in the green belt areas, domestic needs etc. Besides, water meant for drinking/human consumption is being supplied from centralized mines office

In view of the above, it can be stated that the impact on water environment are insignificant. This is corroborated by the fact that inspite of more than 3 decades of mining operations no siltation or allied problems on water environment has been observed so far.

10.4.3.1 IMPACT ON HYDROLOGY:

The rainfall is the major source of ground water recharge in the study area / buffer zone. Estimation of ground water resources and stage of development in the buffer zone as per GEC norms show that Pudur Block of Vilathikulam taluk of Thoothukudi where the mines area Melavenkateswarapuram, Pudur, Nadukattur and Sennayampatti villages are falls, the stage of ground water development in the year 2012 has been categorised by CGWB as **Safe Block**.

Continuous survey, study and monitoring of the seepage zones inside the mine pit and the volume of seepages show that around 70 to 80 m³/day of groundwater from the joint planes at the intersection of limestone beds with granitic rocks, together with another 10 to 20m³/day from the exposed mine faces, flow down in to the mine pit floor.

The above integrated study together with a review of pumping details of evacuation of water from the mine pit indicates availability of around 90m³/day for different uses.

Even though some seepage of water from the joint planes are observed in the mine pit, it is localized insitu seepages as limestone is having low permeability and hydraulic conductivity, hence there is no effect on the nearby irrigation wells. *This levels very clearly indicates that*

there is no hydraulic continuity between the limestone and to the country rocks in the adjoining core and buffer zone areas & this is due to the fact that the limestone is an intrusive body and acts as a ground water barrier which arrests the occurrence movement and distribution of the groundwater either from the limestone to country rock or vice versa.

10.4.4 NOISE & VIBRATION LEVELS:

10.4.4.1 NOISE ENVIRONMENT:

During mining operation there will be noise generation due to working of shovels, drilling, blasting, movement of vehicles etc. Except the active mine area, the noise level in the other areas say at a distance of 10m or so, will be less and within the tolerance limits. The Directorate General of Mines Safety, in circular No. DG (Tech)/18 of 1975, has prescribed the noise level in mining occupations (TLV) for workers, in an 8 hour shift period with unprotected ear as 90 dBA or less

However, the noise will be felt only near the active sources. There will be considerable reduction in the noise level due to the absorption factor, environmental surroundings and other attenuation factors. As far as absorption factor is concerned, If the ground cover is vegetated or has a soft texture, sound will decrease at the rate of 4.5 dB(A) whenever time the distance between the source and the observer is doubled. Besides, there will be shielding factor, which takes into account the environmental surroundings. With every 30m of dense land scape vegetation, 5dB (A) of additional attenuation can be obtained upto a maximum of 10 dB(A). As such at away places the effect of noise will not be felt.

Hence, by continuing the following mitigative measures already being adopted for noise control, the impact on noise levels will continue to be insignificant:

1. Planting rows of native trees along roads, around mine area and other noise generating centers to act as acoustic barriers.
2. Sound proof operator's cabin for equipments like dumpers, shovel, tippers, etc.
3. Proper and regular maintenance of equipments may lead to less noise generation.
4. Providing in-built mechanism for reducing sound emissions.
5. Providing earmuffs to workers exposed to higher noise level.
6. Conducting regular health check-up of workers including Audiometry test for the workers engaged in noise prone area.

7. Displaying the noise level status of operational machinery on the machines to know the extent of noise level and to control the time to which the worker is exposed to higher noise levels.

10.4.4.2 Impacts due to ground vibrational effects due to blasting:

The vibration due to blasting can cause damage to the nearby structures if appropriate technology and control measures are not adopted in the blasting operation. Fly rock is another possible damage causing outcome of blasting. There are many factors which influence fly rock during blasting. Most important of these factors are long explosive column with little stemming column, improper burden, loose material or pebbles near the holes and long water column in the hole.

In the present mine workings, blasting & vibration effects are well controlled by following measures.

- a) Optimum design for burden and spacing.
- b) Inclined drilling practice, whenever necessary.
- c) Reducing explosive charge to minimum.
- d) Proper deck charging practices, looking to consolidation and hardness of strata conditions.
- e) Using ordinary electric milli second delay detonators, in combination with \ denoting fuse etc. This sequence of blasting reduces vibration to a large extent, thereby minimizing propagation of shock waves.

Blasting in Melavenkateswarapuram Limestone is practiced using the latest method of Non- Electric system using Shock tube detonators & Noiseless Trunk line delays as initiation system/ Electronic Detonator & Non Electric Initiation System. This system forms a part of Controlled Blasting system wherein the amount of Explosives blasted in a fraction of time is controlled by introduction of delay timings between the holes so as to reduce the ground vibrations induced due to blasting.

Periodical Ground vibrational studies conducted by TRCL with Mine mate in this mining site shows that the PPV levels at 250m distance is in the range of 0.635 mm / sec for Limestone and for Development the PPV levels at 300m distance is in the range of 0.794 mm / sec which are generally found to be within limits.

By continuation of above measures, it will be ensured that the ground level vibration due to blasting is maintained within the prescribed limits.

10.4.5 IMPACT ON LAND ENVIRONMENT:

In the pre mining stage, out of 98.62 Ha of mine lease area about 97.825 ha of land are private land and the remaining 0.795 Ha are Government land. TRCL is having lease and in possession of the entire lands. There are no forest land in the core zone and no forest land certificate is obtained from DFO, Tamil Nadu Forest Department and given as **Annexure – 16**.

The lease area consists of only bushes at pre-mining stage. Due to mining operations land status changes on account of below stated reasons:

1. Overburden / waste extraction to reach the Limestone.
2. Dumping of overburden / waste in the initial period as well as limestone.
3. Construction of infrastructure facilities such as, office, road etc.

Presently mining operations are carried out in the western block only. About 20.35 Ha & 2.95 Ha are covered under mining & dumping respectively. This is likely to go up to 24.97 Ha & 10.33 Ha under mining & dumping respectively at the end of present Mine Scheme period.

In the ultimate stage about 41.72 Ha of land area will be covered under mining and 16.72 Ha will be under dumps. Besides, 14.13 Ha of land area will be covered under green belt / plantation.

To minimize land degradation, it is proposed to work only one pit at a time. After exhaustion of western block which is worked presently, the eastern block between ML 11 and ML 0 will be taken up for mining. Entire waste removed from eastern block will be used for filling of part of mined out western block.

Out of 41.72 Ha of mined out area an extent of 3.897 Ha will be refilled, about 5.95 ha will be left as water reservoir and the remaining area of 31.87 Ha will have bench plantation.

10.4.5.1 Disposal of waste and land reclamation:

i. Top Soil

There is no likely hood of generation of top soil during scheme period as working will be carried out only in the already opened up pit. Topsoil to be generated in future will be stacked separately and utilized for future reclamation purposes

ii. Waste Disposal and reclamation of backfilled areas

Presently 5 dumps are located within the ML area. The dumps presently located are well within the lease area and also proposed dumping is also within the Mining Lease area. No material will be dumped outside the lease area and so far the entire reject generated as well as top soil generated were dumped in separate dumps located inside the lease only.

The height of present dump yards is 10 to 20 meters. If necessary, the height of the dump yards will be increased to a maximum of 30 meters.

In future, It is estimated that around 18.19 million tonnes of side burden waste and interstitial reject will be generate till the life of the mine in both the blocks. Out of the above, 9.71 million tonnes of developmental waste will be generated from west block, of which about 8.25 Mil.T will be dumped in the proposed dump on the Southern side of eastern block along ML – 4.5 to ML – 10 and the rest 1.46 Mil.T will be utilised for road and bund making along mine periphery. The rest 8.47 Mil.T of development waste from Eastern block will be utilized for refilling the worked out pit between ML 12.40 to 15.00 (western pit) upto the surface after exhausting all the reserves in the western pit area. The total area reclaimed by refilling will be 3.897 Ha.

Dump Management:

The inactive waste dumps and mine boundary are provided with 3 garland drains, two along dump bottoms and one along lease boundary. The garland drains are connected to two settling tanks created in lease area to collect surface runoff and mine water. It is also proposed to construct garland drain for the proposed dump south of the eastern block. This garland drain will be connected to the settling pond of adequate capacity on the southern side of East block.

Due to systematic and well planned designing of dump management on above lines, soil erosion from dumps and land degradation resulting therefrom will be minimal. Good afforestation measures along dump slopes, etc will result in slight improvement in environmental betterment and sustainability to great extent.

10.4.6 BIOLOGICAL ENVIRONMENT:

Other than thorny bushes and few plantations done by the company the core zone is free from any natural vegetation. To reduce the adverse effects on flora/fauna status of the area due to deposition of dust generated from mining operations, water sprinkling and water spraying systems will be ensured in all dust prone areas to arrest dust generation.

Methodical and well-planned plantation scheme is being carried out depending upon the immediate need, priority and availability of land which will be continued in future also. The plantation is being done in multiple rows in a staggered way to cover the area to give the desired stratified appearance of multi tiers.

Presently about 9.175 Ha of area are covered with plantation / green belt, of which 2.90Ha are within the lease area and the remaining 6.275 Ha are outside the lease area. Trees already planted include Neem, Eucalyptus, Naval, Tamarind, Teak, Aval Vagai, Subabul, Mango, Guava,

Kodikai, Panner, Nettilingam, Coconut, Pungai, Northai, Mangium, Elavam, Aala, Casurina, Arasa, Murungai, Banana, Seetha, Vanni, Yellow Arali and Bamboo etc.

In the scheme period about 1.40 Ha within the lease area will be developed with plantation / Green belt. While the species chosen for green belt are fast growing with good canopy and dense leaf density, the avenue plantation shall have fruit and flower bearing and some ornamental plants to give good aesthetic look. Every year on average 750 saplings will be planted. It is planned to plant Neem, Tamarind, Pungai, Naval, Jatropha, Mango etc.

In the ultimate stage, plantation / bench plantation will be carried out in 35.77 Ha mined out area including 3.897 Ha of backfilled area. Besides, 16.72 Ha. of Dump area & Topsoil storage area of 3.70 Ha will also be covered with plantation. Besides, Green belt over an area of 14.13 Ha will be carried out along mine periphery, virgin area and along the mine hauling roads. Thus about 70.32 Ha covered under Green Belt/ Bench Plantation in the total lease area of 96.82 Ha in post operational period.

Thus every effort will be made for regeneration of biodiversity of the mined out area in a scientific way to better the land status.

10.4.6.1 CONSERVATION PLAN

As mentioned in Para 3.7.2, Chapter – III, Schedule – 1 species Indian Pea Fowl (*Pavo Cristatus*) is commonly found in the region. 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. However, Conservation Plan for Indian Pea Fowl (*Pavo cristatus*) is prepared in consultation with the Forest Ranger, Villathikulam range on a combined basis for all the leases of TRCL and its cement plant in the region. This conservation plan was submitted and approved by District Forest Officer- Thoothukudi and the copy of the same is enclosed vide **Annexure – 17**.

Objective of the conservation plan is as follows:

- To help protect the Schedule-I species and their habitats
- To create awareness among the public, especially the students, youth, farmers, & women and involve them in conservation by motivating them

Following short term and long term measures for management of natural and biological resources were suggested in the conservation report:

- ❖ Improvement of Plantation in the area and Construction of few artificial pond

- ❖ Conducting Awareness by direct contact, posters, organizing seminars, related to the conservation etc., educating & creating awareness among the local villagers to enhance conservation ethic among locals.

The proposed combined budget for all the leases of TRCL and its cement plant for conservation plan of Schedule - I Species (Pea fowl) for first 5 years are 5.00 Lakhs.

10.4.7 SOCIO ECONOMIC ENVIRONMENT:

As there are no habitations or hutments in the core zone area, no rehabilitation or resettlement problems will arise here. The predicted pollution scenario in respect of ambient air quality, Noise levels, water aspects, biological aspects etc. have been described earlier in this chapter, which show that all these environmental parameters, even after expansion of the project, will be well within the statutorily prescribed levels. As such, impact due to the project will be positive on socio-economic aspects.

The project operation has resulted in direct employment opportunities for about 46 persons. Besides, indirectly about 200 persons are benefited by gainful indirect employment opportunities through various service related activities like ancillary services, Project related logistical operations for transport of limestone to cement plant, etc, bringing various materials for project operations, etc, various trading services for consumer goods, spare parts, sundry items, etc., Contractual services connected with the project, Green belt and horticultural works in the project, Casual labor needs for various activities.

Besides, there is marked improvement of various facilities in the local areas due to project operation like Improvement in medical and health care system, Improvement in educational services, Infrastructural betterment through better roads, lighting and communicational systems, Betterment of drinking water facilities, Vocational training facilities for local eligible youth of local community to enable them to seek employment in suitable project operations and elsewhere, Benefit to the State and the Central governments through financial revenues by way of royalty, tax, duties, etc from this project directly and also indirectly.

From above details, it is clear that the project operations have highly beneficial positive impact in the area.

TRCL on the whole has spent Rs.7.80 crores during the year 2014-15 under various social welfare measures like donation and repair to temples, school room construction as addition, up gradation of youth skills of local community, sponsorship for sports and cultural activities etc. R.R Nagar unit of TRCL has spent around Rs.172.88 lakhs towards CSR for year

2014 – 15. Rs.21.96 lakhs was spent in year 2015 – 2016 for CSR activities under Melavenkaleswarapuram Limestone Mine lease head.

Based on the needs of the people expressed during Focused Group Discussion, in future, the following social welfare activities will also be undertaken by project authorities to improve the physical and social infrastructures of the local community.

- Roads in the villages shall be repaired and maintained.
- Educational facilities shall be improved.
- Implementation of effective rainwater harvesting system.
- School books & uniforms for poor people shall be provided. Meritorious poor children shall be provided scholarships.
- Financial assistance for conducting local sports, religious and cultural activities.
- Proper drinking water supply shall be provided and regular chlorination of drinking water shall be done.
- Frequent Medical camps will be conducted for the benefit of villagers.
- Awareness programme for the villagers on sanitation, improvement in health standards, birth control. Malaria eradication, HIV prevention, etc, shall be conducted.

Every year from this mine lease, Rs. 20 lakhs will be spent under CSR. The breakup of the same will be decided based on the immediate need and priority.

10.4.8 OCCUPATIONAL HEALTH AND SAFETY ASPECTS:

Hazardous jobs like blasting, loading, etc. are planned to be executed safely and with all precautionary measures as prescribed in Metalliferous Mines Regulations of 1961, so as to minimize hazards and incidences of health problems.

To reduce pollution emanation from the project various mitigative measures as explained above are being and will be taken:

The following remedial steps are being and will be enforced to ensure minimization of occupational health and safety problems.

- Medical examination at pre-entry level stage of workers, etc, by qualified doctors, with periodical examination of all workers/staff at least once a year, as per DGMS circulars. Last year 118 employees of TRCL including the contract employees were covered for medical checkup. Recently Medical examination for both contract & company employees were carried out during June 2015 and a copy of “Form O” is attached as **Annexure – 13**.

- Conducting tests on staff / workers which include spirometry, audiometry, vision test, x-ray, ECG, etc.
- Regular awareness campaigns amongst staff and workers about AIDS, Malaria, etc.,
- Provision of ambulance and First aid facility as necessary,
- Organizing of medical camps at local areas for treatment of patients, especially senior citizens, children and ladies.
- All staff and workers will be provided with PPE to guard against excess noise levels, Dust generation and inhalation, etc., as per standards prescribed by DGMS.
- Occupational health checks up and assessment will be done by trained Doctors from Government Hospital for Occupational Health. Their advice will also be sought frequently in this respect. Health report will be given to employees regularly after health checkups.
- Vocational training will be imparted to all workers/ staff before induction, to make them familiar with jobs and the safety precautions to be taken while doing the jobs. Refresher training will also be arranged as per statutes.
- Provisions of regular records of health checkups, etc. A total budgetary provision of Rs.6.0 lakhs is envisaged for occupational health management, towards financial outlays medicines, health camps and checkups, etc.,

10.4.9 IMPACT ON LOCAL LOGISTICAL SYSTEM DUE TO PROJECT:

The expansion project involves the following production figures with supporting machinery for achieving target.

In the present workings, the ROM limestone dispatches are made to the crusher system at Pandalgudi about 14 kms away through dedicated black topped roads.

The transport details are as follows:

Sl.no	Particulars	Existing	After Expansion
1	Production in MTPA	0.101	0.50
2	No of working days in a year	300	300
3	Daily transport capacity from this mine	340	1670
4	No of Transport hours per day	6	8
5	Truck capacity in T	30	30
6	No of trips per day	12	56
7	No of trips per hour	2	7

Since the transportation from the Melavenkateswarapuram limestone mine to the Crusher plant and subsequently to the RR Nagar cement plant is through dedicated road of TRCL only and the increase in number of trips per hour is just marginally higher, the dedicated black topped road maintained by TRCL can easily absorb the tolerable increase of about 5 trips of trucks per hour without causing significant impact on logistical system in the area. Besides, the road system will be frequently maintained to make it easily and smoothly motorable.

10.5.0 ENVIRONMENTAL MONITORING PROGRAMME:

TRCL has formulated well laid-out Environmental Policy, wherein preservation of environment has been accorded a most strategic and prime position. The various protocol procedures in connection with communication channels upwards and downwards, for dealing with violations or departures in environmental standards involvement of Board of Directors as well as shareholders about such incidences, etc, have been described in detail in chapter VI.

Regular monitoring of implementation of various control measures in respect of air quality, meteorology, water quality, noise levels, biological status, land environment, socio-economic factors, occupational health, etc. is most important to ensure that the project operations do not deteriorate the environmental status of the area at any point of time and environmental quality in respect of above parameters are kept well within the statutorily sustainable levels, as prescribed by CPCB, MOEF&CC and State Pollution Control Board.

A full-fledged environment cell is operating in the Pandalgudi area. This cell will undertake effective monitoring and implementation of various environmental control measures promptly and effectively and to oversee various environmental management schemes for air quality control, water quality status, noise level control, plantation programmes, social development schemes, construction of garland drains, etc. in the cement plant and all the working mines in the area.

The organizational pattern for this cell is shown in para- 6.1 in Chapter-VI. The total recurring costs per annum for environmental control, excluding man power cost, work out to Rs.56 lakhs. In case of any further necessity for funds for implementation of control measures arises, these will be met without any constraint as and when required.

10.6 ADDITIONAL STUDIES:

The additional studies covered for this EIA / EMP report are:

1. Public consultation of the project as per MoEF&CC mandates.

2. Risk Assessment and Disaster Management Plan in connection with mining and allied operations of the project will be spelt out in detail to cover possible dangers / risks / explosions / accidents, etc. likely to arise from the project operations, including onsite and off-site emergency plans to meet the disastrous situations if any.
3. Mine closure planning and various advance actions and finalization of plan to effect closure/abandonment of the mine at the end of mine life.

MoEF&CC in the TOR had directed the project proponent to conduct Public Hearing/Consultation as per EIA Notification dated 14.09.2006. Accordingly, Tamil Nadu Pollution Control Board had issued Public Notices in major dailies (namely Indian Express and Dhinamani) on 21.01.2016 disclosing the details of the Public Hearing scheduled for this project.

The Public Hearing / Consultation was conducted on 25.02.2016 at T.R.Subbaraj Kalyana Mahal, Paralachi Road, Pudur, Villathikulam Taluk, Thoothukudi District through District Collector -Thoothukudi, District Environmental Engineer - Tamil Nadu Pollution Control Board along with the representatives from M/s. The Ramco Cements Limited, the consultants, press fraternity and the public.

At the outset, the District Environmental Engineer, Tamilnadu Pollution Control Board, Thoothukudi welcomed the District Collector, Thoothukudi District and the public, he briefed the requirement of conducting this public hearing in accordance with the Environmental Impact Assessment Notification, dated 14.09.2006 of Ministry of Environment, Forests & Climate Change (MoEF&CC), Government of India, New Delhi.

Totally about 228 numbers of people were present for public hearing, of which about 16 persons expressed their views. Salient details of issue raised in the public hearing and the response from the proponent are given in Para 7.2 in Chapter VII.

The public hearing went on smoothly. Most of the speakers expressed their sincere gratitude for various CSR activities carried out by TRCL and almost all the speakers were in favour of this expansion.

Elaborate description in respect of Risk Assessment & Disaster Management plan, Mine closure plan are given in CHAPTER-VII.

10.7 PROJECT BENEFITS:

As mentioned in CHAPTER-VIII in the report, the working Melavenkateswarapuram Limestone mine of TRCL has brought about transformational prosperity and improvements in physical and social infrastructures in the area like:

- Direct employment to about 46 persons
- Indirect employment to more than 200 persons
- Improvements in infrastructure in the area like Provision of drinking water supply, approach road etc to nearby villages.
- Financial gains for the state and central governments, through collection of various taxes like royalty, cess, central excise/VAT by sale of cement , etc
- Improvement of Educational Facilities in the Surrounding Area.
- Increase in General Awareness of the People.
- Increase in Competitive Spirit Among Youths
- Improvement of the General Living Standard of the People in the Vicinity
- Overall Improvement in HDI (Human Development Index)
- Growth of Allied Industries in the Area.
- Generation of self-employment through self-help groups.
- Reduction in migration of local people and at the same time increase in Inflow from outside.
- Improvement in Per Capita Income.
- Providing certain facilities for the local schools and panchyats

In short, the working mining project has benefitted this region in the fields of potential employment opportunities, improved per capita income for local people, improved social welfare facilities in respect of education, medical healthcare systems, communicational aspects, infrastructural build-up, etc.

The project proponent has already incurred an expense of Rs.7.80 crores during the year 2014 - 2015 for various beneficial social outreach programmes under their 'CSR' initiatives, as stated in para 4.7 in Chapter IV earlier. For future need-based CSR activities, Rs.20 lakh each year from Melavenkateswarapuram mine lease is earmarked by TRCL to improve the social and physical infrastructures considerably in this backward rural area.

Due to well-conceived and well directed CSR activities executed by the company the surrounding population is greatly benefitted. Future CSR activities identified by the company will greatly help the local population. Industrial progress will be achieved at state and National levels due to increase in steel production, for which iron ore is the main constituent additive. This will also help further employment generation, revenue growth, infrastructural growth, GDP growth and precious foreign exchange income for the nation.



It can be seen that the project has bestowed positive tangible benefits both at Macro and Micro levels on account of its contribution to cement production, industrial and infrastructural growth, etc which will be continued in future also.

10.8 CONCLUSION:

A meticulously well planned Environmental Management Plan, with various programme schedules and timely execution objectives, as mentioned above, will ensure that the future environmental quality in the area will be maintained within statutory limits.

The environmental management strategy as explained above will prove that industrial growth, if properly planned with all environmental concerns and appropriate remedial measures can go a long way to improve life pattern and living conditions of the local community around the project.

* * * * *

CHAPTER XI

DISCLOSURE OF CONSULTANTS ENGAGED

Creative Engineers & Consultants, Chennai – 600 059, is an **ISO 9001:2008** certified organization with **NABL** accredited testing laboratory and **NABET** accredited consultancy organization.

Team of people involved in EIA/EMP report preparation for this project is given below:

EXPERT NAME	QUALIFICATION	POSITION	EXPERIENCE
Mr. P. Giri	AMIE (Mining)	EIA Coordinator & Functional area Expert.	Over 25 years of experience in EIA/EMP report, mine plan preparation, including modeling
Mr. P.P. Unny	B.E(Mining & Metallurgy), P.G Diploma in Business Management	Ex- Joint Director Dept. of Geology & Mining of Gujarat Government.- EIA Coordinator & Functional area Expert	Over 30 years experience in EIA/EMP report, mine plan preparation
Mr.M.S.Jayaram	M.Sc (Geology)	Ex- Joint Director Dept. of Geology & Mining of Andhra Pradesh Government.- Expert (Geology, Mining & Environment)	Over 40 years experience in EIA/EMP report, Mine plan , hydrological report preparation,
Mr. K. Shankar	M.Sc (Geology). PGMEMG	Expert in Geology, Hydrology, Solid waste Management etc. IBM approved RQP also.	Over 20 years' experience in EIA/EMP report, Mine plan, hydrological report preparation
Dr. N. Radhakrishnan	M.Sc., M.Tech., Ph.D	Specialized in Spatial Information Technology and Applications (remote sensing, GIS) – Expert (Land use)	Over 20 years experience in using the advanced spatial analysis techniques in GIS environment.
Dr. BVS. Gurunadha Rao	M.E, Ph.D	Expert – Water pollution	Over 30 years of experience in Environmental field
Mr. K Nanaji	M.A (Sociology)	Expert - Socio-economy	More than 10 years of experience in preparation of socio-economy report, R&R survey as part of EIA/EMP study.



**FINAL EIA/EMP REPORT FOR MELAVENKATESWARAPURAM LIMESTONE MINE OF
M/S. THE RAMCO CEMENTS LIMITED, EXTENT – 98.62 HA.**

EXPERT NAME	QUALIFICATION	POSITION	EXPERIENCE
K. Saraswathy	M.Sc – Home Science	Expert - Socio-economy	Over 19 years of work experience in Sociologist.
Mr. S.Saravanan	M.Phil - Botany	Expert (Ecology & Bio diversity)	Over 10 years of work experience in ecology.
Mr.S.S.Rajendran	M.Sc. (Pharmaceutical Chemistry)	Lab Head	More than 7 years of experience in Environmental laboratory.
Ms. V. Sivaranjani	M.Sc.(Env. Sci.)	Functional Area Expert	More than 6 years of experience in preparation of EIA / EMP reports
Ms.K.Abirami	M.Phil (Env. Toxicology.)	Expert	More than 5 years experience in Environment field.
Mr. J. Suresh	DEE	Manager - Field	Over 20 years of field monitoring experience
Mr. R. Gunasekharan	ITI	Sr. Field Technician	Over 15 years of field monitoring experience
Mr. R. Babu raj	M.A (Sociology), B.Com(Y.L&Cost), ITI, Advance Diploma in Computer application	Specialised in CAD and computer software, applications – Sr. Technician (EIA/EMP)	Over 10 years of experience in dispersion modeling, computer applications.
Mr. B. Govindaraman	B.Sc.	Field technician	Over 18 years of field monitoring & data collection experience
Ms. R. Dhanalakshmi	M.Tech Environmental Science & Technology	Functional Area Associate	-
Ms. P. Bhavani	M.Tech Environmental Science & Technology	Functional Area Associate	-

* * * * *



**PROFORMA FOR ENVIRONMENTAL APPRAISAL OF MINING PROJECTS
(MINING SECTOR PROJECTS)**

- Note 1: All information to be given in the form of Annex/s should be properly numbered and form part of reply to this proforma.
- Note 2: Please enter $\sqrt{\quad}$ in appropriate box where answer is Yes / No
- Note 3: No abbreviation to be used - **Not available** or **Not applicable** should be clearly mentioned.
- Note 4: **Core zone** is the mining lease area.
Buffer zone in case of ML area up to 25 ha. is to be considered as **5 km** all around the periphery of the core zone and for ML area above 25 ha. an area **10 km** all around the periphery of the core zone.
- Note 5: Adopt **Scoping process** in carrying out EIA study.
- Note 6: Please indicate source of data.

1. General Information

- (a) Name of the project : **Melavenkateswarapuram Limestone Mine
Extent – 98.62 Ha**
- (i) Name of the proponent : **M/s. The Ramco Cements Limited**
Mailing Address : **M/s. The Ramco Cements Limited
"Auras Corporate Centre"
V Floor, 98-A Radhakrishnan Road,
Mylapore, Chennai - 600 004.**
- E-mail : **ms@ramcocements.co.in**
- Telephone : 044 - 28478666, 28478656
- Fax No. : 044 – 28478676
- (b) Objective of the project : **Increase the production in this lease area
from 0.101MTPA to 0.50 MTPA (0.726MTPA
of ROM).**
- (c) Location of mine (s)

Village(s)	Tehsil	District	State
Pudur, Nadukattur, Senayyampatti	Vilathikulam	Thoothukudi	Tamil Nadu

(d) Does the proposal relate to

(i)	New mine	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
(ii)	Expansion	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>
	• Increase in ML area	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
	• Increase in annual production	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>
(iii)	Renewal of ML	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>
(iv)	Modernization	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>

(e) Site Information

(i) Geographical Location

• Latitude	N9° 17 31.5 - N9° 18 08.1
• Longitude	E78° 09 48.7 - E78° 11 04.0
• Survey of India Topo sheet number	No. 58 K/3
• Elevation above Mean Sea Level	+53m to +60m
• Total mining lease area (in Ha.)	98.62 Ha

(ii) Dominant nature of terrain

• Flat	<input type="checkbox"/>	<input checked="" type="checkbox"/>
• Undulated	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
• Hilly	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

2. Land usage of the mining lease area (in ha.)

(a)	Agricultural	<input type="text" value="-"/>
(b)	Forest	<input type="text" value="-"/>
(c)	Waste land (Government Land)	0.795 Ha
(d)	Grazing	<input type="text" value="-"/>
(e)	Surface water bodies	<input type="text" value="-"/>
(f)	Others (Private Land)	97.825 Ha
	Total	98.62 Ha

3. Indicate the seismic zone in which ML area falls. In case of zone IV & V, details of earth quakes in last 10 years.

The area is situated in Seismic Zone II of Intensity indicating seismically least active.

(a) Severity (Richter Scale)

(b) Impact i.e. Damage to

• Life	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
• Property	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
• Existing mine	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>

4. Break-up of mining lease area (in ha.) as per approved conceptual plan:

Purpose	Mining Lease Area				Total	Area acquired				Area to be acquired			
	Government		Private			Government		Private		Government		Private	
	Forest	Others	Agri.	Others		Forest	Others	Agri.	Others	Forest	Others	Agri.	Others
1. Area under mining	---	0.795	---	40.925	41.72	---	0.795	---	40.925	---	---	---	---
2. Storage for top soil	---	---	---	3.70	3.70	---	---	---	3.70	---	---	---	---
3. Overburden / Dumps	---	---	---	16.72	16.72	---	---	---	16.72	---	---	---	---
4. Mineral storage	---	---	---	Nil	Nil	---	---	---	Nil	---	---	---	---
5. Infrastructure (Workshop, Administrative Building)	---	---	---	0.05	0.05	---	---	---	0.05	---	---	---	---
6. Roads	---	---	---	0.20	0.20	---	---	---	0.20	---	---	---	---
7. Railways	---	---	---	Nil	Nil	---	---	---	Nil	---	---	---	---
8. Green Belt	---	---	---	14.13	14.13	---	---	---	14.13	---	---	---	---
9.Tailings pond	---	---	---	Nil	Nil	---	---	---	Nil	---	---	---	---
10.Effluent treatment plant	---	---	---	Nil	Nil	---	---	---	Nil	---	---	---	---
11.Coal handling plant / mineral separation plant	---	---	---	Nil	Nil	---	---	---	Nil	---	---	---	---
12. Township area	---	---	---	Nil	Nil	---	---	---	Nil	---	---	---	---
13.Other (Virgin & Unused land)	---	---	---	22.10	22.10	---	---	---	2.60	---	---	---	---
TOTAL	---	0.795	---	97.825	98.62	---	0.795	---	97.825	---	---	---	---

5. Township (outside mining Lease) Existing township of TRCL to be utilised

(a) Total area (in ha.)	<input type="text" value="--"/>
(b) No. of dwelling units	<input type="text" value="--"/>
(c) Distance from mine site	<input type="text" value="--"/>

6. Distance of water bodies (in km)

Distance from	River Bank*	Other Water Bodies* Sea / creek / lake / nalla etc. (specify)
Mine lease boundary	-	Uppu Odai – 5 km

[* From highest flood line / high tide line]

7. For projects falling within the Coastal Regulation Zone (CRZ) - Not Applicable

Whether the mineral to be mined is of rare nature and not available outside CRZ?

Yes

No

[If yes, annex a scaled location map showing low tide line (LTL), high tide line (HTL) duly demarcated by one of the authorized agencies* [*Director, Space Application Centre, Ahmedabad; Centre for Earth Sciences Studies, Thiruvananthapuram; Institute of Remote Sensing, Anna University, Chennai; Institute of Wetland Management & Ecological Designs, Kolkata; Naval Hydrographer's Office, Dehradun; National Institute of Oceanography, Panjim, Goa; and National Institute of Ocean Technology, Chennai], boundary of mining lease area, distance of ML area from LTL and HTL, CRZ boundary and CRZ classification of the project area as per the approved Coastal Zone Management Plan, and settlements, sand dunes, mangroves, forest land / patches, turtle breeding and nesting sites etc., if any, in the project area.]

8. Indicate aerial distance from the periphery of core zone / area from the periphery of buffer zone to the boundary of following (Buffer zone up to 10 km from lease boundary) :

Sl. No.	Areas	Name	Aerial Distance (km)	
			Core Zone*	Buffer Zone*
1	National Park / Sanctuary	Nil		
2	Biosphere Reserve / Tiger Reserve / Elephant Reserve / any other Reserve	Nil	-	-
3	Forest (RF / PF / unclassified)	Nil	-	-
4	Habitat for migratory birds	Nil	-	-

5	Corridor for animals of schedule I & II of the Wildlife (Protection) Act, 1972	<i>Nil</i>	-	-
6	Archaeological sites * Notified * Others	<i>Nil</i>	-	-
7	Defence Installation	<i>Nil</i>	-	-
8	Industries / Thermal Power Plants	<i>Nil</i>		-
9	Other Mines	<i>Sivalarpatti mines South</i>	-	0.84 km - NW
		<i>Sivalarpatti mines North</i>	-	3.3 km - NW
		<i>M.P Gudi mine</i>	-	8.2 km - N
		<i>Lovely Mines</i>	-	2.0 km - NW
		<i>Pandalgudi Mines</i>	-	8.9 Km - NW
		<i>ICL Mines</i>	-	6.5km & 10.50 km - N
10	Airport	<i>Madurai</i>	-	75 Kms. (From the Mines)
11	Railway Lines	<i>Aruppukottai</i>	-	30 km
12	National / State Highways	<i>NH - 45B (Madurai-Thoothukodi)</i>	-	10.5km - NW

[* Buffer zone in case of ML area up to 25 ha. is to be considered as **5 km** all around the periphery of the core zone and for ML area above 25 ha. an area **10 km** all around the periphery of the core zone].

9. Description of flora & fauna separately in the core and buffer zones*

[* Consult the Wildlife (Protection) Act, 1972 as amended subsequently and list species with (1) Common name (2) Scientific name and (3) under which schedule of the Wildlife (Protection) Act the identified species fall. Get the list authenticated by an Expert in the field / credible scientific institute / University / Chief Wildlife Warden office. **Information to be based on field survey.**

A. Flora	Core Zone	Buffer Zone
1. Agricultural crops	-	Near tanks and stream courses, paddy cultivation is observed. Seasonal crops such as Ragi, Sorghum and gram varieties such as black gram, horse gram etc are grown along with fodder grass. Sunflower is also grown in some parts.
2. Commercial crops	-	Sunflower

A. Flora	Core Zone	Buffer Zone
3. Plantation	<ul style="list-style-type: none"> • The ML area is mostly barren land with few small shrubs and trees • Common variety of trees like <i>Prosopis juliflora</i>, <i>Accasia nilotica</i>, <i>Albizzia amera</i>, <i>Azadirachta indica</i> etc., shrubs namely <i>Morinda tinctoria</i>, <i>Calotrophis gigantea</i>, <i>Jatropha</i> sps., <i>Zizypus jujuba</i> etc., • Herbs like <i>Achyranthus aspera</i>, <i>sida aquata</i>, <i>Corchorus</i> sps., <i>Tridax procumbens</i>, <i>Adathoda versica</i>, <i>Tephrosia purpuria</i> etc., are found. • Grasses are <i>Cyanodon dactylon</i>, <i>Commelina clavata</i>, <i>Juncus bufonicus</i>, <i>Kyllinga cylindrica</i>, <i>Pycneus globosus</i>, <i>Pycneus unioloides</i>, <i>Fimbristylis kingii</i>, <i>Fimbristylis uliginosa</i>, <i>Carex nubigena</i>, <i>Carex phacota</i>, <i>Carex filicina</i>, <i>Oplismenus undulatifolius</i>, <i>Arundinella fuscata</i>, <i>Setaria glauca</i>, <i>Andropogon foulkesii</i>, <i>Chrysopogon zeylanicus</i>, <i>Heteropogon contortus</i>, <i>Cymbopogon polyneuros</i>, <i>Tripogon bromoides</i>, <i>Eragrostis nigira</i>, etc., 	
4. Natural vegetation/forest type		<ul style="list-style-type: none"> • No forest areas within the buffer zone. • Trees like <i>Azadirachta indica</i> (neem), <i>Prosopis Juliflora</i>, <i>Acacia auriculiformis</i>, <i>Morinda Tinctoria</i>, <i>Acacia Leucopholea</i>, <i>Albizzia lebbeck</i>, <i>Cocus nucifera</i>, etc. are commonly seen. • Dominant shrubs consists of <i>Atlantica monophylea</i>, <i>Cassia auriculata</i>, <i>Carissa carandas</i>, <i>Dichroalchys cinerea</i>, <i>Dodones viscosa</i>, <i>Euphorbia antiquorum</i>, <i>Fluggea leusopyrus</i>, <i>Gmelina</i>, <i>Randia</i>

A. Flora	Core Zone	Buffer Zone
		<i>dumetorum</i> etc. • Climbers consists of <i>Acacia instia</i> , <i>Pterolobium indicum</i> , <i>Zizyphus oenoplia</i> , <i>Abrus precatorius</i> • Prominent herbs are <i>Aera lanata</i> , <i>Sida cordifolia</i>
5. Grass lands	--	--
6. Endangered species	Nil	
7. Endemic species		
8. Others (Specify)		(Refer Table 3.13 of EIA report)
B. Fauna		
1. Total listing of faunal elements	-	(Refer Table 3.14 of EIA report)
2. Endangered species	-	Schedule – I species: <i>Pavo cristatus</i> (Peafowl) is present in the buffer zone
3. Endemic species	Nil	
4. Migratory species		
5. Details of aquatic fauna, if applicable	-	

10. Details of mineral reserves (as per approved Mining Plan)

	Quantity (in Tonnes)
(a) Proved	7409807
(b) Indicated	941360
(c) Inferred	1145032
(d) Mineable reserves (Proved)	7409807

11. Major geological formation / disturbances in the mining lease area

(a) Geological maps submitted	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>
Refer Figure No – 2.1				
(b) Geological sections submitted		<input checked="" type="checkbox"/>		<input type="checkbox"/>
Refer Figure No – 2.2				
(c) Contour map submitted	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>
Refer Figure No – 2.3				
(d) Whether the presence, if any, noted of				
(i) Faults	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
(ii) Dykes	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
(iii) Shear Zone	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
(iv) Folds	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>

(v) Other weak zones Yes ☐ No ☒

(e) Source of data (Indicate)

Mining plan report

12. Production of mineral(s) and life of mine

(a) Rated capacity of mine mineral wise (Tonnes / annum) **0.50 Million**

(b) Life of mine at proposed capacity (Years) **12 years**

(c) Lease period (Years) **Up to 28.07.2023**

(d) Date of expiry of lease (D /M /Y) **Valid up to 28.07.2023 as per recent ordinance**

(e) Indicate in case of existing mines

(i) Date of opening of mine **Year 1985**

(ii) Production in the last 5 years from year **2011** to year **2016** in million tonnes.

Year	Production (in Metric Tonnes)
2011-12	53936.73
2012-13	52253.11
2013-14	84328.61
2014-15	92300.11
2015-16	99782.05

(iii) Projected production for the next 5 years from year **2016** to year **2021** in tonnes.

Year	Production in Tonnes
2016-17	723000
2017-18	726950
2018-19	720000
2019-20	720000
2020-21	720000

(iv) Whether mining was suspended after opening of the mine? Yes ☐ No ☒
If yes, details thereof including last production figure and reason for the same.

(f) Whether plans & sections provided? Yes ☒ No ☐

13. Type and method of mining operations

TYPE		METHOD	
Opencast	<input checked="" type="checkbox"/>	Manual	<input type="checkbox"/>
Underground	<input type="checkbox"/>	Semi-mechanised	<input type="checkbox"/>
Both	<input type="checkbox"/>	Mechanised	<input checked="" type="checkbox"/>

14. Details of ancillary operations for mineral processing

- | | |
|----------------|-----------------------------------------------------|
| (a) Existing | Nil |
| (b) Additional | <i>There is no proposal for mineral processing.</i> |

15. Mine details

(a) **Opencast mine**

- | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| (i) Stripping ratio (mineral in tonnes to over burden in m ³) | 1: 2.45 (T: T) |
| (ii) Ultimate working depth (in m bgl) | -10 RL in western block and
0 RL in eastern block |
| (iii) Indicate present working depth in case of existing mine (in m bgl) | +26 RL |
| (iv) Thickness of top soil (in m.) | |
| • Minimum | - |
| • Maximum | - |
| • Average | - |
| (v) Thickness of overburden (in m.) - <i>Side burden waste and interstitial reject will be generated</i> | |
| • Minimum | - |
| • Maximum | - |
| • Average | 1.5m |
| (vi) Mining Plan | |
| • Height and width of the bench in overburden / waste. | Max. Height – 9 m
Width – more than height |
| • Height & width of the bench in ore body / coal seam. | Max. Height – 9m
Width – more than height |
| • Proposed inclination / slope of the sides of the opencast mine (separately for overburden, coal / ore and overall slope of the pit sides) both while operating the mine as well as at the time of closure of the mine. | UPS – 45° |
| • Whether transverse sections across the opencast mine at the end of fifth year and at the end of the life of the mine have been submitted? | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |

(Refer Figure No – 2.4 & 2.5 in Chapter - II)

(vii) Type of blasting, if any, to be adopted.

Latest Blasting techniques like NONEL, Electronic System of Initiation system to maintain charge per hole and charge per delay as the same. By adopting such advanced practices in blasting we are controlling PPV well within the norms of 10 mm/sec.

(b) Underground mine

Not Applicable

(i) Seam / Ore body In-depth (m) Max. Depth (m) Avg. thickness (m)

Rate of dip
in degree

Direction of dip

(ii) Mode of entry into the mine

- Shaft
- Adit
- Incline

(iii) Details of machinery

- On surface
- At Face
- For transportation
- Others

(iv) Method of stoping (metalliferous mines)

- Open
- Filled
- Shrinkage
- Caving
- Combination of above
- Others (Specify)

(v) Extraction method

- Caving

- Stowing

- Partial extraction

(vi) Subsidence

- Predicted max. subsidence (in m)

- Max. value of tensile strain (in mm/m)

- Max. slope change (in mm/m)

- Whether identified possible subsidence area(s) superimposed on Surface Plan has been submitted?

- Major impacts on surface features like natural drainage pattern, houses, buildings, water bodies, roads, forest, etc.

- Salient features of subsidence management (monitoring and control).

16. Surface drainage pattern at mine site

- (a) Whether the pre-mining surface drainage plan submitted?

Yes

☒

No

☐

(Refer Figure No – 3.16 of Drainage Pattern of Core & Buffer Zone)

- (b) Do you propose any modification / diversion in the existing natural drainage pattern at any stage? If yes, when. Provide location map indicating contours, dimensions of water body to be diverted, direction of flow of water and proposed route / changes, if any i.e. realignment of river / nallah / any other water body falling within core zone and its impact.

Yes

☐

No

☒

17. Embankment and / or weir construction

- (a) Do you propose, at any stage, construction of

- (i) Embankment for protection against flood?

Yes

☐

No

☒

- (ii) Weir for water storage for the mine?

Yes

☒

No

☐

- (b) If so, provide details thereof.

Details are given in Chapter – 4.3.1 D in chapter - IV

- (b) Impact of embankment on HFL and settlement around.

Not Applicable

(d) Impact of weir on down stream users of water. **Not Applicable**

18. Vehicular traffic density (outside the ML area)

In the present workings, the ROM limestone despatchers are made to the crusher system at Pandalgudi about 14 kms away through dedicated black topped roads.

	Type of vehicles	No. of vehicles per day
(a) Existing	Truck	1444
(b) After the proposed activity	Truck	56
(c) Whether the existing road network is adequate? If no, provide details of alternative proposal?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

19. Loading, transportation and unloading of mineral and waste rocks on surface:

(a) Manual	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
(b) Tubs, mine cars, etc.	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
(c) Scraper, shovels, dumpers / trucks.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
(d) Conveyors (belt, chain, etc.)	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
(e) Others (specify).	<input type="text" value="-"/>	

20. Mineral(s) transportation outside the ML area

	Qty. (in TPD)	Percentage (%)	Length (in km)
(a) Road	1670	100	14
(b) Rail	-	-	-
(c) Conveyors	-	-	-
(d) Rope way	-	-	-
(e) Water ways	-	-	-
(f) Pipeline	-	-	-
(g) Others (Specify)	-	-	-
Total	1670	100	14

21. Baseline Meteorological and Air Quality data

(a) Micro-meteorological data

[Continuous monitoring through autographic instrument for one full season other than monsoon]

- (i) Wind rose pattern for one full season (16 points of compass i.e. N, NNE, NE, ---) based on 24-hourly data. For coastal area also furnish day-time and night time data.

- Day time
- Night time
- 24 – hours period

Season: Winter 2013-2014, for wind rose Refer Figure No 3.7

(ii) Site specific monitored data

Month	Wind Speed (kmph)			Temperature (°C)			Relative Humidity (%)			Rain Fall * (mm)			Cloud Cover** (Octas of sky)
	Mean	Max.	% of calm	Mean (Dry Bulb)	Highest	Lowest	Mean	Highest	Lowest	Total	24-hours Highest	No, of rainy days	Mean
	<1.8	20.4	-	-	42.0	19.0	-	96.0	28.0	-	-	-	-

Predominant wind direction - **NE**

* 24-hours rainfall should be reported from 08:30 hrs. IST of previous day to 08:30 hrs. IST of the day.

* Rainy day is considered when 24 hrs.

** Visual observations of cloud cover should be recorded four times a day at regular intervals.

- (iii) Indicate name and distance of the nearest IMD meteorological station from which climatological data have been obtained for reporting in the EIA report, if any. - **Site specific data was collected**

(b) Ambient air quality data* (RPM, SPM, SO₂, and NO_x)

[*Monitoring should be carried out covering one full season except monsoon – same season as in 21 (a) (i)]

[*Frequency of sampling: Sampling to be done twice a week for the entire season 24 hourly for SPM & RPM. For gaseous pollutants 24- hourly data be given irrespective of the sampling period.]

- (i) Season and period for which monitoring has been carried out. **Winter season (Dec 2013 – Feb 2014)**

- (ii) No. of samples collected at each monitoring station: **24 no. of samples from each station**

SEASON: WINTER - 2013-2014
VALUES IN $\mu\text{g}/\text{m}^3$

S.NO	PARAMETERS	Cat.* (R, I, S)	PM ₁₀			PM _{2.5}			SO ₂			NO ₂		
	LOCATIONS		Min.	Avg	Max.	Min.	Avg	Max.	Min.	Avg	Max.	Min.	Avg	Max.
1	MINE LEASE AREA MV PURAM	R	65.6	73.6	86.6	25.8	29.0	34.7	3.6	4.9	6.2	8.1	10.4	13.4
2	KAMBATTU PATTI	R	50.9	58.4	68.2	20.0	22.8	26.4	BDL (D.L-3.0)	3.7	4.6	6.7	8.7	10.8
3	MELVENKATESWARAPURAM	R	48.7	57.8	69.2	18.9	22.3	26.8	BDL (D.L-3.0)	3.7	4.6	7.2	9.0	11.4
4	PUDUR	R	55.7	62.4	72.3	22.4	26.2	30.4	3.2	4.2	5.2	7.7	9.9	12.6
5	SIVALARPATTI	R	59.0	65.8	76.2	23.0	26.4	31.5	3.3	4.4	5.6	7.7	9.9	12.8
6	MUTHUPATTI	R	45.4	52.9	61.3	18.3	21.0	24.5	BDL (D.L-3.0)	3.6	4.5	6.4	8.3	10.7
CPCB LIMITS			PM ₁₀			PM _{2.5}			SO ₂			NO ₂		
2009 Notification		I & R	100			60			80			80		
		S	100			60			80			80		

* Note: Category - R - Residential, I - Industrial, S – Sensitive
BDL- Below Detectable Limit, DL- Detectable Limit.

22. Stack and emission details , if any* - Not Applicable

Sl. No.	Process / unit of operation (e.g. DG Set, Boiler)	Height of stack (m)	Internal top dia. (m)	Flue gas exit velocity (m/sec)	Emission rate (kg/hr)				Heat emission rate from top of stack (K.cal/hr)	Exhaust / Flue gas			
					SPM	SO ₂	NO _x	CO		Temp °C	Density	Specific Heat	Volumetric flow rate (m ³ /hr.)

23. Details of fugitive emissions during mining operations*

The fugitive emissions during mining operations are mostly the dust from various sources such as drilling, blasting, excavation and movement of vehicles.

Please refer Para 4.2.1 of Chapter –IV of EIA/EMP report.

24. Air Quality Impact Prediction (AQIP)*

(a) Details of model(s) used for AQIP including grid size, terrain features, and input meteorological data.

Model Used - ISCST3
Grid Size - 500 m
Terrain features - Plain terrain
Meteorological data - Meteorological data generated at mine site
for Winter season – 2013 - 2014

(b) Maximum incremental GLC values of pollutants based on prediction exercise

S. NO	LOCATION	BACKGROUND CONCENTRATION OF PM ₁₀ (µg/m ³)	PREDICTED INCREMENTAL CONCENTRATION OF PM ₁₀ (µg/m ³)	(in µg/m ³)
				POST PROJECT CONCENTRATION (µg/m ³)
1	MINE LEASE AREA MV PURAM	86.6	2.4	89.0
2	KAMBATTU PATTI	68.2	<1.0	69.2
3	MELVENKATESWARAPURAM	69.2	<1.0	70.2
4	PUDUR	72.3	1.0	73.3
5	SIVALARPATTI	76.2	<1.0	77.2
6	MUTHUPATTI	61.3	<1.0	61.3

[* Question Number 22, 23 & 24 need not be filled-in for mines having ML area of **25 ha. or less.**]

[**Information on item no. 2 & 3 to be provided in cases with captive power generation of 500 KVA and above]

25. Water requirement (m³/day)

- For domestic sanitary needs - 3.0 m³/day
- For dust suppression and green belt development etc - 47.0 m³/day
- Total water requirement** - **50.0 m³/day**
- Recharge purpose - 40.0 m³/day
- **Total availability (seepage water)** - **90.0 m³/day**

26. Source of water supply*

S. No.	Source	m ³ /day
1	River (name)	NIL
2	Ground water(from Bore Well)	NIL
3	Mine water (sump / pit)	90
4	Other surface water bodies (specify)	NIL

[*Annex a copy of sanction letter / permission from the concerned authority (Central Ground Water Authority in case of ground water abstraction is from notified area / State Ground Water Board in case of non-notified area / State Irrigation Department for surface water pumping) for drawing water.]

The exhausted Mine Pit between ML - 1 and ML – 4 in Pandalgudi Mines is kept as a reservoir and is being utilized for other captive mines also. TRCL has established water treatment plant in Pandalgudi to treat the mine water for drinking purposes for both colony and other mines work sites.

27. Lean season flow in case of pumping from river / nalla (cumecs)

28. Ground water potential of the study area

NA

28.1. Ground water availability

(a) Range of water table (m bgl)

(i) Pre-monsoon

• Core Zone

10 to 12 m

• Buffer zone

9 to 14 m

(ii) Post-monsoon

• Core Zone

8 to 10 m

• Buffer zone

3 to 6 m

(b) Total annual replenishable recharge (million m³/ year) of the block

• By ground water table fluctuation method

23.55

• By rainfall infiltration factor method

14.45

• Total Recharge

20.45

(c) Annual draft excluding estimated draft through mine discharge (million m³/ year)

5.93

(d) Estimated draft through mine discharge (million m³/ year)

0.03

(e) Net annual ground water availability (million m³/ year)

14.49

(f) Stage of ground water development is %

30%

28.2. Water demand - Mentioned above

S. No.	Usage	Present Consumption (m ³ /day)		Additional proposed as per local plan (m ³ /day)		Total (m ³ /day)	
		Surface	Ground	Surface	Ground	Surface	Ground
1	Domestic	-	3.0	-	-	-	3.0
2	Irrigation	-	-	-	-	-	-
3	Industry	-	-	-	-	-	-
4	Mining	-	-	-	-	-	-
5	Others (specify) Water sprinkling / dust suppression/ Green Belt/ Workshop	-	47.0	-	-	-	47.0
	Total	-	50.0	-	-	-	50.0

29. Water quality*

- (a) Annex physico -chemical analysis of water at intake point **

Ground water quality of the region is given in Table – 3.10 of EIA Report

- (b) In case of existing mine, annex report on quality of water discharge
i.e. complete physico - chemical analysis**

Mine pit water quality is given in Table – 3.10 of EIA Report

[*For non-discharging mines at least four ground water samples to be taken preferably from downstream direction of the mine in pre-monsoon and post-monsoon periods and analysed. For discharging mines six samples are to be analysed]

**All parameters as per BIS 10500. Indicate name of Methodology, Equipment used for analysis, and Detection Level (DL) for each parameter.

*** Wherever any analytical parameter is below detection level, “BDL” (Below Detection Level) should be written instead of ‘NIL’.

30. Impact on ground water regime / stream / lake / springs due to mine dewatering *

- (a) Radius of influence (in m) - ***Insignificant due to hard rock terrain and seepage in the faces and Flore***

[To be estimated based on analysis of pumping test data and application of empirical formula]

- (b) Whether saline water ingress will take place?
(applicable to coastal areas)

Yes

☐

No

☒

- (c) Impact on stream / lake / springs - ***Nil***

[* Provide a comprehensive hydro-geological assessment report if the average mine dewatering is more than 100 m³/day and or going below water table in non-monsoon period. The report should be based on preferably latest one year pre-monsoon and post-monsoon baseline data covering information on ground water situation, aquifer characteristics, water level conditions (April – May and November), estimate of ground water resources, predicted impact of the project on ground water regime and detailed remedial / conservation measures such as artificial recharge of ground water etc. The report should be based on actual field inventory out of existing wells, at least 30 observation wells in the buffer zone with supplementary information from secondary sources (mention name). For estimation** of ground water resource (refer question no. 28 above) be designated study area of the buffer zone may be sub-divided into command and non-command areas, watershed-wise (in case of hard rock / consolidated formations) / block-wise / mandal-wise in case of alluvial / unconsolidated formations)]

[**For estimating ground water resources in the area follow the Ground Water Estimation Committee recommendations of 1997]

31. Waste Water Management

Mine

(a) Daily average discharge (m³/day) from different sources

(i) Mine water discharge during

• Lean period

-

• Monsoon period

-

Depends on rainfall

(ii) Workshop

Nil

(iii) Domestic (mine site)

Negligible

(iv) Beneficiation / Washeries

Nil

(v) Coal Handling Plant

Nil

(vi) Tailings pond

Nil

(vii) Others (Specify)

Nil

Total

Nil

(b) Waste water treatment plant; flow sheet for treatment process attached.

Yes

No

✓

TRCL has established water treatment plant in Pandalgudi to treat the mine water for drinking purposes for both colony and other mines work sites.

(c) Quantity of water recycled / reused / to be recycled in

(i) Percentage - **100%**

(ii) m³/day - **90**

(d) Point of final discharge : **Not applicable**

Final Point	Quantity discharged (in m ³ /day)
1. Surface	-
(i) Agricultural land	
(ii) Waste land	
(iii) Forest land	
(iv) Green belt	
2. River / nallah	-
3. Lake	-

4. Sea	-
5. Others (specify)	-
Total	-

(e) Users of discharge water

(i) Human	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
(ii) Livestock	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
(iii) Irrigation	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
(iv) Industry	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
(v) Others (specify)	<input type="text" value="-"/>			

(f) Details of the river / nalla, if final effluent is / will be discharged (cumecs)

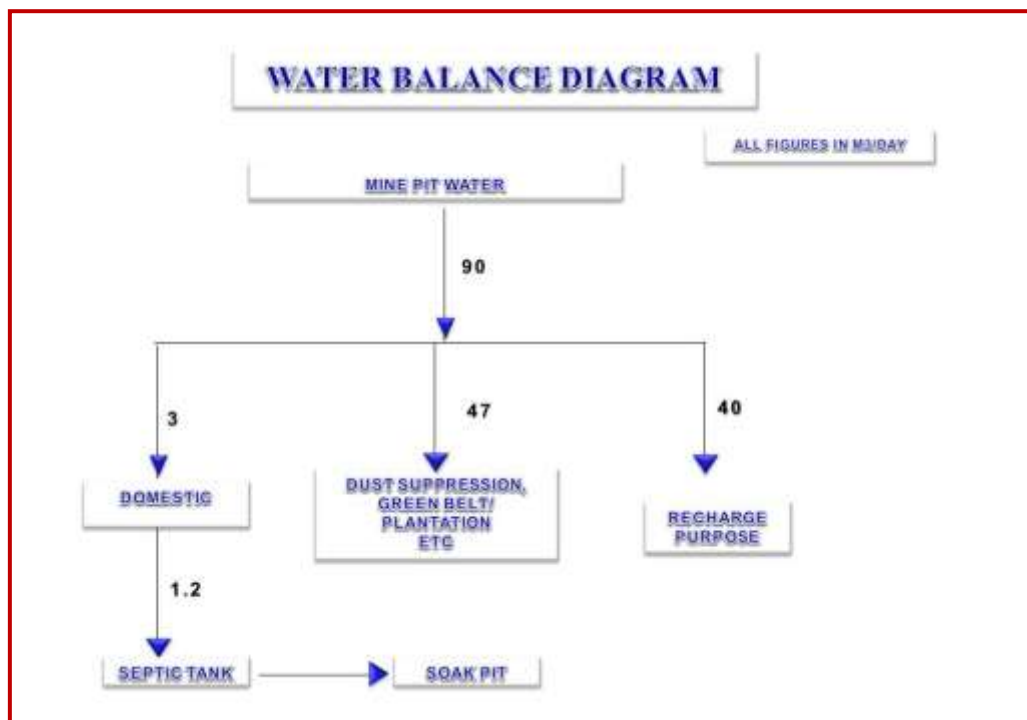
Not applicable as no effluent will be discharged outside

(i) Average flow rate	<input type="text"/>		
(ii) Lean season flow rate	<input type="text"/>		
(iii) Aquatic life	<input type="text"/>		
(iv) Analysis of river water 100 meters upstream and 100 meters downstream of discharge point submitted.	Yes	<input type="checkbox"/>	No <input type="checkbox"/>

Township

(a) Waste water generation from township (m ³ /day)	<input type="text" value="Nil"/>		
(b) Are you planning to provide sewage treatment plant?	Yes	<input type="checkbox"/>	No <input checked="" type="checkbox"/>
(c) Usage of treated water	Yes	<input type="checkbox"/>	No <input checked="" type="checkbox"/>

32. Attach water balance statement in the form of a flow diagram indicating source(s), consumption (Section-wise) and output.



33. Ambient noise level leq dB(A) :

Details are given in Para 3.5, Table No – 3.11, Chapter – III of EIA/EMP Report

Date and time of monitoring	MVN1	MVN2	MVN3	MVN4	MVN5	MVN6
Day Equivalent	56.0	48.7	49.3	49.9	49.3	45.2
Night Equivalent	42.8	39	38.5	38.9	39	38.2
Day & Night Equivalent	54.4	47.1	47.7	48.3	47.7	43.8
MIN	38.8	36.8	36.5	37.5	37.6	36.5
MAX	59.8	51.2	54.4	52.2	52.7	49.8

34. Solid Waste

- (a) Top soil and Solid waste quantity and quality

Name (Lump/fines/slurry / Sludge/others)	Composition	Quantity (m ³ /month)	Method of disposal
Mining activity*	a. There is no likely hood of generation of top soil	Negligible	a. If any Top soil will be generated which will be used for afforestation purposes
a. Top Soil			
b. Over burden	b. Side burden		b. Out of the 18.19million tonnes, 9.71 million tonnes of waste will

c. Others (specify)	waste and interstitial reject	About 18.19 Mil.Tonne	be generated from west block, of which about 8.25 Mil.T will be dumped Southern side of eastern block along ML – 4.5 to ML – 10 and the rest 1.46 Mil.T will be utilised for road and bund making along mine periphery. The rest 8.47 Mil.T of development waste from Eastern block will be utilized for refilling the worked out pit between ML 12.40 to 15.00 (western pit) upto the surface after exhausting all the reserves in the western pit area. The total area reclaimed by refilling will be 3.897 Ha. The area between ML 1.0 to 10.00 & 16.00 – 20.00 will be left as water reservoir. An area of 5.95 Ha will be left as water reservoir.
Effluent Treatment Plant (sludge)	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Total		About 18.19 Mil.Tonne	

[* Annex layout plan indicating the dump sites.]

- (b) (i) Does waste (s) contain any hazardous/toxic substance/
radioactive materials or heavy metals? Yes ☐ No ☒
- (ii) If yes, whether details and precautionary measures provided? Yes ☐ No ☒

(c) Recovery and recycling possibilities. **Not Applicable**

(d) Possible user(s) of the solid waste. **Will be dumped in the waste dump**

- (e) (i) Is the solid waste suitable for backfilling? Yes ☒ No ☐

- (ii) If yes, when do you propose to start backfilling.

Development waste from Eastern block will be utilized for refilling the worked out pit between ML 12.40 to 15.00 (western pit) upto the surface after exhausting all the reserves in the western pit area. The total area reclaimed by refilling will be 3.897 Ha.

(in million m³)

Solid waste (s)	Already accumulated (A)	To be generated (B)	% of A & B to be backfilled	
			A	B
Over burden	-	About 18.19 million Tonnes	Nil	46.56% (8.47 million tonnes)
Others (specify)	-	-	-	-

Land reclamation Plan

(f) In case waste is to be dumped on the ground, indicate

(i) Associated environmental problems

*Given in **Para 4.5.1, Chapter - IV***

(ii) Number & type of waste dumps

- No. of external dumps

**Presently – 5
Proposed- - 1**

- Max. projected height of dumps (in m)

30

- No. of terraces and height of each stage

Terrace for 10 m each

- Overall slope of the dump (degree)

28°

- Proposed reclamation measures

The inactive waste dumps and mine boundary are provided with 3 garland drains, two along dump bottoms and one along lease boundary. The garland drains are connected to two settling tanks created in lease area to collect surface runoff and mine water. It is also proposed to construct garland drain for the proposed dump south of the eastern block. This garland drain will be connected to the settling pond of adequate capacity on the southern side of East block.

(iii) Section of the waste dump in relation to the adjacent ground profile attached.

Yes

☐

No

☒

35. (a) Total power requirement

(in MW)

S. No		Mine Site	Township	Others (specify)	Total
1	Present	1,00,000 units / annum	-	-	1,00,000 units / annum
2	Proposed / additional	-	-	-	
Total		1,00,000 units / annum			1,00,000 units / annum

(b) Source of power

(in MW)

S. No.		SEB/Grid*	Captive power plant	DG Sets
1	Present	Yes	No	Emergency purpose only
2	Proposed	-	-	
Total		Yes		

[* Annex a copy of the sanction letter from the concerned authority]

(c) Details of fuels

S.No.	Fuel	Daily Consumption (TPD)		Calorific value (Kcals/kg)	% Ash	% Sulphur
		Existing	Proposed			
1	HSD	0.7 KLD	3.5 KLD	As per	IOC	Supplies
2	LSHS	-	-	-	-	-
3	Other (specify)	-	-	-	-	-

36. Storage of inflammable / explosive materials

S. No.	Name	Number of Storages	Consumption (in TPD)	Maximum Quantity at any point of time
1	Fuels	-	-	-
2	Explosives	2 permanent	1 TPD	2.5 TPD

37. Human Settlement

	Core Zone	Buffer Zone
Population*	-	60898
No. of villages	-	37
Number of households village-wise	-	16561

[* As per 2011 census record or actual survey] **As per 2011 census record**

38. Rehabilitation & Resettlement (R&R) Plan* - **Not Applicable**

[*Provide a comprehensive rehabilitation plan, if more than 1000 people are likely to be displaced, other-wise a summary plan]

(a) Villages falling within the study area

	Villages	
	Number	Name
Core zone	Nil	--
500 m from the blasting site (s)	Nil	--
Buffer zone	37	Given in Table No – 3.1 of EIA Report
Township site		

(b) Details of village(s) in the core zone: **Not Applicable**

Details of Village(s) in the Core Zone: Not Applicable				
S. No.	Village name	Population*		Average Annual Income
		Tribal	Others	
No Villages as the project is within the ML area				

[*As per 2001 census / actual survey] **As per 2011 census record**

(c) Population to be displaced and / or Land oustees – **Not Applicable**

Name of village(s) falling within	Number of oustees		
	Land (only)	Homestead (only)	Land and Homestead (both)
Mining Lease			
Township Site			

(d) Whether R&R package has been finalised? If yes, salient features of R&R plan for oustees.

Not Applicable

- (i) Site details where the people are proposed to be resettled & facilities existing / to be created.
- (ii) Funds earmarked for compensation package.
- (iii) Agency /Authority responsible for their resettlement.
- (iv) Time of commencement of resettlement of Project Affected People (PAP).
- (v) Period by which resettlement of PAP will be over.

39. Lease -wise plantation details

(a)	Lease area (in ha.)	<u>Existing mine</u>	<u>New mine</u>			
(i)	Area broken up	20.35	-			
(ii)	To be broken up	21.37	-			
(iii)	Area not to be broken-up	56.9	-			
(b)	Township area (in ha.)	-	-			
(c)	Area afforested and proposed (in ha.)					
		Peripheral	Dumps	Roads	Township	Others
(i)	Existing	2.90	-	-	-	6.275*
(ii)	Proposed	14.13	16.72	-	-	39.47**

***- Plantation in Outside the lease area**

**** - Plantation in Mined area & Topsoil storage area**

- (d) No. and type of trees planted and proposed

(i) Existing

• When plantation was started?

Month / Year

1985

No.of plant species planted	Number saplings (per ha.)
10100 nos (9.175 Ha)	1000

Survival rate %

70 %

• Avg. height

2-3 m

- (ii) Proposed

No. of plant species to be planted	Number of saplings (per ha.)
Region specific plantation will be carried out as per suggestion of forest department officials.	1600

40. Environmental health and safety

(a) What major health and safety hazards are anticipated?

The main health hazards associated in the mining activity are:

- 1. Respiratory problems due to air borne dust.*
- 2. Hearing loss due to noise level.*

The safety hazards associated with the mining activity are:

- 1. Mishaps due to human errors.*
- 2. Fall from the heights.*
- 3. Operation of HEMM.*

(b) What provisions have been made/proposed to be made to conform to health and safety requirements?

To reduce pollution emanation from the project, following measures are being and will be taken:

- a. Water sprinkling on haul roads and dumping yards, etc.*
- b. Wide green belt barrier creation to arrest dust and reduce noise propagation.*
- c. Acceptance of good control measures for reducing air pollution, as mentioned earlier in the chapter.*
- d. Control of noise levels through good preventive maintenance of machineries, green belt creation, provision of ear muffs to workers, etc.*

Health:

All the work men and staff are medically examined as per DGMS circular applicable to occupational health. Air borne dust is suppressed by regular water sprinkling. Heavy machineries is provided with airtight AC cabins. Personal protective equipment like earmuff / plug, safety shoes, helmets, dust masks are provided as per provisions of Mines Act, 1952.

Medical examination at pre-entry level stage of workers, etc, by qualified doctors, with periodical examination of all workers/staff at least once a year, as per DGMS circulars. Last year 118 employees of TRCL including the contract employees were covered for medical checkup. Recently Medical examination for both contract & company employees were carried out during June 2015 and a copy of "Form O" is attached as Annexure – 14.

Provisions of regular records of health checkups, etc. A total budgetary recurring provision of Rs.6.0 lakhs is envisaged for occupational health management, towards financial outlays for ambulance, doctors, staff, medicines, health camps and checkups, etc.,

Safety:

1. **Personal protective equipment will be provided to the employees**
2. **All electric equipment will be provided with proper earthing**
3. **Regular training programme for the workers will be conducted**

All the safety measures will be taken as per the Mines Act 1952 and rules & regulations made there under

(c) In case of an existing mine

- (i) Comprehensive report on health status of the workers as under the Mines Act annexed. Yes ☒ No ☐

(Refer a copy of "Form O" attached as Annexure – 13 in EIA report)

- (ii) Mineralogical composition of RPM (dust) -

Free silica

- Chromium* (Total as well as Hexavalent)
- Lead**

[* Only for Chromite mines]

[**Only for Base Metal mines] - **Silica values are BDL (DL-0.05mg/m³)**

- (d) Information on radiation protection measures, if applicable. - **Not Applicable**

41. Environmental Management Plan

Salient features of environmental protection measures

S. No.	Environmental issues*	Already practiced, if applicable	Proposed
1	Air pollution	<ul style="list-style-type: none"> • Drilling with dust extractors, usage of sharpened drill bits and Deployment of mobile water tanker for fugitive dust suppression in haul roads • Well-designed blasting • Frequent water sprinkling on haul roads and active mine face using Mobile tankers • Regular maintenance of vehicles • Extensive greenbelt in the mine area 	
		<ul style="list-style-type: none"> • Domestic effluent from the mines is collected in septic tank with soak pit arrangement 	<ul style="list-style-type: none"> • The domestic effluents from the mines are collected in septic tank with soak pit arrangement.

2	Water pollution	<ul style="list-style-type: none"> • 2 nos of settling / recharge pond has been constructed & Garland drains to arrest siltation and channelizing storm run-off water. • Mine sump water conforming to discharging standards can be directly used for dust suppression on roads, in the green belt areas, domestic needs etc. • Besides, water meant for drinking/human consumption is being supplied from centralized mines office. 	<p><i>The following mitigative measures will be implemented for prevention of silt being carried away into nearby water bodies / land and control water environment in the area.</i></p> <ul style="list-style-type: none"> • Providing dump tops with inner slopes and through a system of drains and channels, water will be allowed to descent into surrounding drains, so as to minimize the effects of erosion arising out of uncontrolled descent of water. • The dump tops and sides of inactive areas will be progressively reclaimed with grasses and shrubs like Agave, Nuna, grasses to arrest and prevent erosion. • Construction of garland drains of suitable size around mine area and external dump with proper gradients to prevent rain water descent into active mine area. Garland drains & sedimentation ponds have been made already to arrest siltation and channelizing storm runoff water. 3 garland drains, two along dump bottoms and one along lease boundary have been made which measure 1.2 km x 2m x 2m in all three cases. • The material removed from the drain is dumped on the periphery and an earthen embankment / retaining wall is made to prevent any runoff or wash off from the dump reaching the nearby private lands. • One settling / recharge pond proposed to be constructed with the size of 100m x 40m x 2.5 m after expansion • A safety distance of 10m will be left from the nearby private land on the western side and the toe of the dump and this area will be planted with local native species. • It is proposed to leave a 50m
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			<i>barrier on the South western side from the dump toe to a small tank located just outside the lease. This area can also be planted with native trees.</i>
3.	Water conservation	<ul style="list-style-type: none"> • <i>Water sump, and water pond in the mined out area helps in recharge groundwater level and rainwater harvesting in mined area.</i> • <i>TRCL is maintaining a mined out void in Pandalgudi lease as a good rainwater harvesting reservoir. This pond caters the needs of the entire TRCL mines, cement plant and colony potable water requirements.</i> • <i>Besides, roof top harvesting measures in the colony, administrative buildings are also created.</i> 	
4.	Noise pollution	<ul style="list-style-type: none"> • <i>Development of green barrier, periodical maintenance of HEMM etc.,</i> • <i>Sound proof operator's cabin for equipments like dumpers, shovel, tippers, etc.,</i> • <i>Providing in-built mechanism for reducing sound emissions.</i> 	
5.	Solid waste / Tailings	<i>Dumping in dumping yard and stabilisation. Re-vegetation to be undertaken on the inactive slopes and benches.</i>	<i>The inactive waste dumps and mine boundary are provided with 3 garland drains, two along dump bottoms and one along lease boundary. The garland drains are connected to two settling tanks created in lease area to collect surface runoff and mine water. It is also proposed to construct garland drain for the proposed dump south of the eastern block. This garland drain will be connected to the settling</i>

			<i>pond of adequate capacity on the southern side of East block.</i>
6.	Land degradation	<i>Presently mining operations are carried out in the western block only. About 20.35 Ha & 2.95 Ha are covered under mining & dumping respectively. This is likely to go up to 24.97 Ha & 10.33 Ha under mining & dumping respectively at the end of present Mine Scheme period.</i>	<i>In the ultimate stage about 41.72 Ha of land area will be covered under mining and 16.72 Ha will be under dumps. Besides, 14.13 Ha of land area will be covered under green belt / plantation. Out of 41.72 Ha of mined out area an extent of 3.897 Ha will be refilled, about 5.95 ha will be left as water reservoir and the remaining area of 31.87 Ha will have bench plantation.</i>
7.	Erosion & Sediment	<i>By proper stabilisation of dumps.</i>	
8.	Top soil	<i>Top soil will be preserved and used for plantation on waste dumps.</i>	
9.	Ground vibration	<i>Use of non-electric detonators along with delays Controlled blasting techniques. Carrying out vibration studies and following the recommendations of blasting studies. Periodic monitoring by blast mates</i>	
10.	Others (specify)	<i>Regular monitoring of environmental parameters and implementation of various environmental control measures. Please refer Chapter-6, of EIA/EMP report.</i>	

[* As applicable]

42. Compliance with environmental safeguards (For existing units)

- (a) Status of the compliance of conditions of Environmental clearance issued by MoEF, if any, enclosed. Yes ☒ No ☐

Refer Annexure – 9 in EIA report

- (b) Status of the compliance of 'Consent to Operate' issued by SPCB, if any, enclosed. Yes ☒ No ☐

Refer Annexure – 11 in EIA report

- (c) Latest 'environmental statement' enclosed. Yes ☒ No ☐
Refer Annexure – 8 in EIA report

43. Scoping of EIA

Whether environmental impact assessment of the project has been carried out by following scoping process?

Yes ☐ No ☒

Not given in TOR issued by MOEF

If yes, a copy of scoping of EIA annexed.

Yes ☐ No ☒

44. Mine closure

- (a) Have you planned mine closure?

Yes ☒ No ☐

- (b) Submitted a conceptual mine closure plan.

Yes ☒ No ☐

- (c) If yes, indicate estimated amount for implementing the same (in Rs. lakhs)

Rs. 11,48,750 Financial Assurance Submitted.

45. Capital cost of the project (in Rs. Lakh)
(Based on latest estimate)

The capital cost of this project is about Rs. One crore.

46. Cost of environmental protection measures
(in Rs. Lakh)

**Rs.56.00 Lakhs; (Recurring Cost)
Refer Table 6.3 of EIA report**

47. Amount earmarked for socio-economic welfare measures for the nearby villages other than R&R plans.

Every year from this mine lease, Rs. 20 lakhs will be spent under

48. Public Hearing

- (a) Date of Advertisement

21/01/2016

- (b) Newspapers in which the advertisement appeared

- **Dhinamani**
- **The Indian Express**

- (c) Date of public hearing (DD/MM/YYYY)

25/02/2016

- (d) Public Hearing Panel chaired by & members present

District Collector, District Environmental Engineer- Tamil Nadu Pollution Control Board, Representatives from TRCL, the consultants, Press fraternity and the public.

(e) No. of people attended the public hearing meeting and number of people from the lease area. 228 30

(f) Summary/details of public hearing in tabular form.

Enclosed as Annexure – 15 at the end of the report and para 7.2, Chapter - VII

49. Whether the following approvals* (wherever applicable) have been obtained?

(i) Site clearance from MoEF Yes ☒ No ☐

(TOR issued by MOEF which is enclosed as Enclosure 1.1 in Chapter – I)

(ii) 'Consent for Establishment' from the State Pollution Control Board Yes ☒ No ☐

(Refer Annexure – 6 in EIA report)

(iii) NOC from Atomic Mineral Division Yes ☐ No ☒

(iv) Mining plan approval from IBM / Ministry of Coal Yes ☐ No ☒

(v) In case of existing mines, mining scheme approval from IBM Yes ☒ No ☐
(Refer Annexure - 2 in EIA report)

(vi) Forestry clearance under FCA, 1980 Yes ☐ No ☒

(vii) NOC from Chief Controller of Explosives Yes ☒ No ☐

(Refer Annexure – 7 in EIA report)

(viii) Commitment regarding availability / pumping of water from the concerned Authorities Yes ☒ No ☐

(Refer Annexure – 10 in EIA report)

As per CGWB direction in the month of March 2015 to approach State PWD related to all type of groundwater NOC. Based on which, we have submitted application on 6.4.2015 to state PWD, Taramni for MV. Puram mine Ground water NOC. PWD reply letter received on 13.05.2015, mentioning that NOC related clarification sought from govt.



**FINAL EIA/EMP REPORT FOR MELAVENKATESWARAPURAM LIMESTONE MINE OF
M/S. THE RAMCO CEMENTS LIMITED, EXTENT – 98.62 HA.**

So far, this issue is not formulated by PWD for sanctioning ground water NOC mines.

- (ix) In case of ML area falling in notified areas of the Central Ground Water Authority, NOC from them. Yes ☐ No ☒
[* Annex copies of approvals and number them]

50. Was / is there any court case relating to the project or related activities? Yes ☐ No ☒
If so, provide details present status.

Verification: The data and information given in this proforma are true to the best of my knowledge and belief.

Date: 24.04.2017

Signature of the applicant* with full name & address

Place: Chennai

[* Owner or his authorized signatory]

For THE RAMCO CEMENTS LIMITED

M. SRINIVASAN

Given under the seal of organisation on behalf of whom the applicant is signing



MINE LEASE RENEWAL



ABSTRACT

Industries – Mining and Minerals - Mining Lease – Limestone – Thoothukudi District – Vilathikulam Taluk – Sennayampatti, Pudur and Nadukattur Villages – Over an extent of 98.62.0 hectares of patta and poramboke lands – Mining Lease renewal application of Tvl. Madras Cements Ltd. (now The Ramco Cements Ltd.) - Grant of renewal – Orders - Issued.

INDUSTRIES (MMA.1) DEPARTMENT

G.O. (Ms.) No.168

Dated: 17.11.2014

திருவள்ளூர் ஆண்டு 2045

ஜய வரடும், கார்த்திகை திங்கள் 1

Read:

1. G.O. (Ms.) No. 1033, Industries Department, dated: 28.7.1982.
2. G.O. (Ms.) No. 497, Industries (DII) Department, dated: 23.3.1988.
3. From Tvl. Madras Cements Ltd., Renewal of Mining Lease application dated: 22.7.2002.
4. From the District Collector, Thoothukudi, Letter No.GM1/810/2002, dated: 4.6.2013.
5. From the Commissioner of Geology and Mining, Letter No.5216/MM4/2013, dated: 16.5.2014.

-0-

ORDER:

In the Government order first read above, orders were issued granting Mining Lease to Tvl. Madras Cements Limited for mining limestone over an extent of 255.85 acres (253.20 acres of patta and 2.65 acres of poramboke) land in Sennayampatti, Pudur and Nadukattur Villages, Tirunelveli District for a period of five years. Subsequently in the G.O. second read above, the above grant of lease was revised and orders were issued granting the mining lease for a period of 20 years from 29.07.1983 to 28.07.2003. The mining lease expired on 28.07.2003.

2. In the letter third read above, Tvl. Madras Cements Limited, Rajapalayam have applied for grant of renewal of Mining Lease for limestone on 22.07.2002 over an extent of 103.53.0 hectares (255.85 acres) in Sennayampatti, Pudur and Nadukattur Villages in Vilathikulam Taluk, Thoothukudi District for a period of 20 years commencing from 29.07.2003.

3. In the letter fourth read above, the District Collector, Thoothukudi has forwarded the renewal application of Tvl. Madras Cements Limited to Government through the Commissioner of Geology and Mining. In the letter fifth read above, the Commissioner of Geology and Mining has recommended for grant of renewal of mining lease in favour of Tvl. Madras Cements Limited, Rajapalayam (Now the Ramco Cements Limited) to mine the mineral limestone in (Patta land in the name of the Madras Cements Limited 95.51.5 hectares and patta land consent obtained through

agreement 2.31.0 hectares and poramboke land 0.79.5 hectares) over an extent of 98.62.0 hectares in Sennayamaptti, Pudur and Nadukattur Villages of Vilathikulam Taluk, Thoothukudi District for a period of twenty years subject to the conditions already imposed in the G.O. second read above and subject to the following conditions in addition to the other usual conditions in the prescribed Act and Rules:

- a. The applicant company should leave a safety distance of 7.5 mts. to the adjacent patta lands and there should not be any hindrance to the adjacent pattadars and public while quarrying and transportation of minerals from the subject area.
- b. The applicant company should submit latest mining due clearance certificate issued by the District collector concerned for the mining leases hold by the applicant company in the state of Tamil Nadu before execution of lease deed.
- c. As per the instructions of the Ministry of Mines, Government of India in letter F.No.10/75/2008-MV, dated 23.12.2010, the lessee should conduct prospecting work in their leasehold area and estimate the reserves in UNFC system in such a way that mining lease area to be equally demarcated for prospecting work such that all the prospecting work is completed in a period of 5 years from the date of registration of the lease deed and have to submit the report to the Indian Bureau of Mines.
- d. The grant of renewal of mining lease is liable to be cancelled if it is found that it was grossly inequitable or was made under a mistake of fact or owing to misinterpretation or fraud or in excess of authority.
- e. The royalty, dead rent, and surface rent payable shall be at the rates prescribed from time to time under second schedule of Mines and Minerals (Development and Regulation) Act, 1957.
- f. The Surface rent, annual compensation and water charges at such rates as the land revenue and other cess assessable on the land shall be paid.
- g. Mode of payment of royalty, dead rent, annual compensation and surface rent or any other levy that may be levied by the Government, from time to time and shall be paid without any deduction by the lessee. Belated payment of any levy to the Government will be charged with interest at the rate specified in the Mineral Concession Rules, 1960.

4. The Government after careful examination, have decided to accept the recommendation of the District Collector, Thoothukudi and Commissioner of Geology and Mining. Accordingly, sanction is accorded for grant of renewal of Mining Lease in favour of Tvl. Madras Cements Limited, Rajapalayam (Now the Ramco Cements Limited) to mine the mineral limestone in (Patta land in the name of the Madras Cements Limited 95.51.5 hectares and patta land consent obtained through agreement 2.31.0 hectares and poramboke land 0.79.5 hectares) over an extent of 98.62.0 hectares as detailed in Appendix-I to this order in Sennayamaptti, Pudur and Nadukattur Villages of Vilathikulam Taluk, Thoothukudi District for a period of twenty years with effect from 29.07.2003 subject to the conditions mentioned in the Appendix-II to this order and also the conditions mentioned in para 3 and subject to production of the latest Mining Due Clearance Certificate and Income Tax Clearance to the District Collector before execution of lease deed.

5. The rate of royalty, dead rent shall be as follows:-

- Royalty:- : Limestone shall be collected at the latest rate prescribed in the second schedule of Mines and Minerals (Development and Regulation) Act, 1957 fixed by the Ministry of Mines, Government of India, New Delhi.
- Dead Rent:- : Limestone shall be collected at the latest rate prescribed in the third schedule of Mines and Minerals (Development and Regulation) Act, 1957 fixed by the Ministry of Mines, Government of India, New Delhi.
- Surface rent and Water Rate:- : At such rate as the land revenue and other cesses assessable in the land are to be paid.

6. For Surface Right over the Government poramboke land the District Collector, Thoothukudi shall fix and collect the compensation amount annually under rule 72 of the Mineral Concession Rules, 1960.

7. The applicant shall pay a deposit of Rs.10,000/- (Rupees Ten Thousand only), as prescribed in rule 32 of Mineral Concession Rules, 1960 before the lease deed is actually executed.

8. The terms and conditions mentioned in the Appendix-II to this order are subject to such further modifications, additions and alterations as may be included in the lease deed when finalised.

9. The District Collector, Thoothukudi District is requested to take necessary further action for execution of the lease deed in the prescribed form and to ensure compliance by the applicant firm of the amended provisions of Mines and Minerals (Regulation and Development) Act, 1957 and Mineral Concession Rules, 1960 and other applicable Acts and Rules including Forest (Conservation) Act, 1980 before the lease deed is executed. A report may be sent to the Government through the Commissioner of Geology and Mining as soon as the lease deed is executed.

(BY ORDER OF THE GOVERNOR)

C.V. SANKAR
PRINCIPAL SECRETARY TO GOVERNMENT

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

The District Collector, Thoothukudi (w.e.) (By RPAD)

✓ M/s Ramco Cements Limited, Ramasamyraja Nagar-626 204,
Virudhunagar District, Tamil Nadu.

The Controller General, Indian Bureau of Mines,
2nd Floor, 'A' Block, Indira Bhavan, Civil Lines, Nagpur-440 001.

The Regional Controller of Mines, Indian Bureau of Mines,
No.29, Vijayara ghava Road, T.Nagar, Chennai-600 017.

Copy to:

The Senior Personal Assistant to Hon'ble Minister for Industries, Chennai-600 009.

Industries (OP.II) Department, Chennai-600 009.

SF/SCs.

// Forwarded / By order //

[Signature]
Section Officer
19.11.2014

APPENDIX – I

G.O. (Ms.) No. 168 Industries (MMA.1) Department, dated: 17.11.2014

Details of Lands recommended for renewal of Mining Lease

VILLAGES : SENNAYAMPATTI, PUDUR AND NADUKATTUR

TALUK : VILATHIKULAM,

DISTRICT : THOOTHUKUDI

VILLAGE: SENNAYAMPATTI			
Survey No.	Patta land (Extent in acres)	Extent in Hects.	Classification
24/1	1.14	0.460	Patta dry
2	0.45	0.180	Patta dry
26/1	2.04	0.825	Patta dry
2	1.82	0.735	Patta dry
3	3.50	1.450	Patta dry
4	3.20	1.295	Patta dry
27	8.44	3.415	Patta dry
29/1	3.25	1.315	Patta dry
2	1.60	0.650	Patta dry
3	0.24	0.095	Patta dry
5	0.32	0.130	Patta dry
7	0.24	0.095	Patta dry
8	0.46	0.185	Patta dry
9	3.65	1.480	Patta dry
31/1	0.84	0.340	Patta dry
2	0.27	0.110	Patta dry
3C	1.00	0.435	Patta dry
4	1.04	0.420	Patta dry
5	1.02	0.415	Patta dry
32/1	2.00	0.810	Patta dry
2	3.05	1.230	Patta dry
3	1.20	0.485	Patta dry
33/1	1.58	0.640	Patta dry
2	1.84	0.745	Patta dry
3	0.70	0.285	Patta dry
4	4.02	1.620	Patta dry
5	2.70	1.095	Patta dry
34/1	2.68	1.090	Patta dry
2	2.46	0.995	Patta dry
3	0.92	0.370	Patta dry
4	0.42	0.170	Patta dry
5	0.52	0.210	Patta dry
6	0.82	0.330	Patta dry
35/1	4.32	1.750	Patta dry
2	4.38	1.770	Patta dry
3	0.40	0.160	Patta dry
4	0.43	0.175	Patta dry
5	1.50	0.640	Patta dry
36/1	3.54	1.435	Patta dry
2	4.70	1.900	Patta dry

VILLAGE – PUDUR				
Survey No.	Patta land (Extent in acres)	Poramboke land Extent in hectares	Extent in Hectares	Classification
86/2	1.28		0.520	Patta dry
3	1.21		0.490	Patta dry
4	1.22		0.495	Patta dry
5	0.50		0.200	Patta dry
6	0.56		0.225	Patta dry
7	1.00		0.405	Patta dry
8	0.48		0.195	Patta dry
9		0.34	0.140	Poramboke Cart Track
10	0.14		0.055	Patta Dry
87/1	1.62		0.650	Patta Dry
2		0.42	0.170	Ourani
3	0.62		0.250	Patta Dry
4		0.22	0.090	Poramboke Cart Track
5	0.08		0.030	Patta Dry
6	3.16		1.285	Patta Dry
7	1.82		0.740	Patta Dry
8		0.03	0.010	Poramboke Cart Track
88/1	0.04		0.015	Patta Dry
2		0.05	0.020	Poramboke Cart Track
3	3.18		1.285	Patta Dry
5	2.00		0.805	Patta Dry
91/1		0.02	0.010	Poramboke Cart Track
2	7.56		3.060	Patta Dry
92/1	1.46		0.590	Patta Dry
2	5.14		2.080	Patta Dry
93/1	2.10		0.850	Patta Dry
2	0.95		0.385	Patta Dry
3	1.52		0.615	Patta Dry
4	4.15		1.680	Patta Dry
5		0.88	0.355	Oodai
94/1	0.62		0.250	Patta Dry
2	2.24		0.910	Patta Dry
3	0.94		0.380	Patta Dry
4	1.46		0.590	Patta Dry
Total	47.05	1.96	19.83	Patta Dry

VILLAGE: NADUKATTUR			
Survey No.	Patta land (Extent in acres)	Extent in Hects.	Classification
239/1	3.00	1.215	Patta Dry
2	1.90	0.770	Patta Dry
240/3	0.15	0.060	Patta Dry
4	1.00	0.405	Patta Dry
5	1.20	0.485	Patta Dry
6	1.01	0.410	Patta Dry
252/1	3.10	1.250	Patta Dry
Total	11.36	4.595	

ABSTRACT

Name of Village	Patta land in the name of Madras Cements Ltd. (Hectare)	Patta land – Consent obtained through Agreement (Hectare)	Poramboke land (Hectare)	Total (Hectare)
Sennayampatti	71.88.5	2.31.0	---	74.19.5
Pudur	19.03.5	---	0.79.5	19.83.0
Nadukattur	4.59.5	---	---	4.59.5
TOTAL	95.51.5	2.31.0	0.79.5	98.62.0

C.V. SANKAR
PRINCIPAL SECRETARY TO GOVERNMENT

// True copy //

M. Subash
Section Officer,
19.11.2014.

APPENDIX -II

G.O. (Ms.) No. 168 Industries (MMA.1) Department, dated: 17.11.2014

The transport permit (with dispatch slip, if necessary in the case of bulk permits) may be issued at the request of the lessee on collection of royalty for the quantity of mineral mined from the leasehold area and ready to be transported. No bulk permit for larger quantity in anticipation of mining of the minerals should be issued, as this may lead to advance collection of royalty which was objected to by the Government of India, unless the lessee is willing to pay in advance for his own convenience. The accounts relating to the collection of actual royalty or dead rent should be reconciled at the end of the year before 10th January of the succeeding year.

2. The lessee shall pay before the expiry of the lease or its sooner determination by either part of amount equal to the annual dead rent or such high amount as may be fixed by the Collector of the District in his discretion as compensation for damage to the land covered by the lease.

3. The lessee shall not fell trees, if any, without the previous permission of the Collector and if it is found that he has fell any trees without such permission, he shall pay the value of the trees together with a compounding fee subject to a maximum of ten times the value of the said trees.

4. The lessees shall not operate on the surface of any area prohibited by any authority by laying out roads, erecting building, machinery etc. without the previous permission of such authority of the State Government.

5. The lessee shall not use land for surface occupation without giving proper notice to the Collector.

6. The lessee shall provide and shall keep at all times at or near the pit head full equipment of weighing machines or modern types to the satisfaction of the Collector for weighing the minerals collected by him;

7. The lessee will exercise the liberties and powers hereby granted in such manner as to offer no unnecessary or reasonable avoidable obstruction or interruption to the development and working of any minerals not included in this lease and will at all times afford to the Governor and to the holder of prospecting licences or mining lease in respect of any such mineral or any minerals within any lands adjacent passage upon and across the said lands to such minerals for the purposes of getting, working, developing and carrying away the same.

8. The lessee shall take such precautions as are necessary to secure pits and shafts by putting up wire fencing or such other protection to the satisfaction of the Collector to prevent accidents.

9. That on the occurrence of any accident the lessee shall report such accident immediately to the nearest police station, the nearest factory Inspector and the Labour Commissioner.

10. The lessee shall execute an indemnity bond to Government against the claims of third parties.

11. The lessee will at the expiration or sooner determination of the said term deliver upto the Governor all mines pits, shafts including drifts, levels, waterways, airways and other work (now existing) thereafter to be sunk or made under the said lands (except such as may have been abandoned with the sanction of the Government or in any ordinary and fair course of working) and all (engine, machinery, plant buildings, structures and other work and conveniences which at the commencement of the said terms were upon or under the said lands and all) Engines, Machinery, Plant and Fixtures set by the lessee below ground level which cannot be removed without causing injury to any mines or works under the said lands (except such of the same as may with the sanction of the Governor have become discussed) and all buildings and structures of brick or stone executed by the lessee above ground level in good repair order and condition and fit in all respects for further working of the said minerals.

12. If after the determination of the lease there shall remain in or upon the said lands any engines, machinery, plant, buildings, structures, transways, railways and other works, erections and conveniences of minerals or mineral ores other property which the lessee is entitled to remove from the land the same shall, if not removed by the lessee within one calendar month after notice in writing requiring their removal is given to the lessee by the Collector be deemed to become the property of the Government of Tamil Nadu and maybe sold in such manner as they shall deem fit without ability to pay and compensation or to account to the lessee in respect thereof.

13. In the event of existence of state of war or of grave national emergency (of which the President of India shall be the sole judge and a notification to this effect in the Gazette of India shall be conclusive proof the Governor after notice in writing to the lessee under the hand of any Secretary to Government of his intention so to do may forthwith taken possession of assume control of the works, plant and machinery and premises of the lessee at or in connection with the said mines and may pre-empt at prices fixed by the Governor all the minerals and all products thereof extracted from or lying upon the said mines during such possession or control and the lessee shall confirm and obey all directions given by or on behalf of the Governor regarding the use or employment of such works, plans premises provided that a fair compensation which shall be determined by the Governor and shall be paid to the lessee for all loss or damage sustained by reasons or in consequences of the exercise of the powers shall not determined the said terms hereby granted or affect the terms and provisions of these presents further than may be necessary to give effect to the provisions of this clause.

14.(a) the lessee shall not enter upon or commence prospecting of mining operations in any reserve forest situate upon the said land without thirty days previous notice in writing to the District Forest Officer nor without obtaining any written sanction of that officer nor otherwise than in accordance with such conditions as that officer may in his absolute discretion prescribed.

(b) the area within the reserved forest limits must be demarcated by a declared fire line of 40 feet width which will be cut and kept cleared by the Forest Department at the expense of the lessee;

- (c) the lessee must at all times permit the Forest Department to enter upon the land for the purpose of maintaining or repairing existing boundary lines within the area, and must pay the cost of such maintenance or repair as determined by the District Forest Officer;
- (d) the lessee must take suitable precautions to prevent fire from spreading into the adjoining reserve forest from the land and if such fires accidentally occurs he must render all possible assistance in putting them out;
- (e) the lessee shall not cut any trees or growth on the area granted in excess of 20 percent of the number of trees on the whole area under the lease without the previous permission of the District Forest Officer and the value of such trees etc., shall be paid for by the lessee at rates to be fixed by the District Forest Officer, he must not deface or interfere with any boundary stone or marks, if any boundary mark is accidentally damaged, he must bring the matter immediately to the notice of the Range Officer.

15. The lessee shall keep the stock of beryl or any other prescribed substance under section 3 of the Atomic Energy Act No.XXIX of 1948, if they occur in the property covered by the lease with a view to making them available to the Government of India.

C.V. SANKAR
PRINCIPAL SECRETARY TO GOVERNMENT

// True copy //

M. Shihabudeen
17.11.14
Section Officer.

19.11.2014



COPY OF PRESENT MODIFIED MINING SCHEME
APPROVAL LETTER

Annexure - 2

SPEED POST

Registered Parcel

Government of India
Ministry of Mines
Indian Bureau of Mines
Office of the Regional Controller of Mines

Telefax no. 044-24911295
Email ID: rcomchennai@yahoo.co.in

C4A Rajaji Bhavan
Besant Nagar
Chennai – 600 090.

No. TN/TKD/MP/LST/149.MDS

Dated : 18/5/2015

✓ To :

20 MAY 2015

The Ramco Cements Ltd.
V- Floor, Auras Corporate Centre
98-A Dr. Radhakrishnan Road
Mylapore
Chennai – 600 004.

Sub. : Approval of Modified Mining Plan (including Progressive Mine Closure Plan) for Melvenkateswarapuram Limestone Mines over 98.62 Ha. (G.O.Ms.No.168) in Sennayampatti, Pudur & Nadukattur Villages, Vilathikulam Taluk, Thoothukudi District, Tamilnadu State submitted under rule 22(6) of MCDR, 1988.

Ref. : Your letter no. nil dated 11.05.2015.

Sir,

In exercise of the power conferred by the clause(b) of sub-section (2) of Section 5 of the Mines and Minerals (Development & Regulation) Act, 1957 read with Government of India Order No. S.O. 445(E) dated 28.04.1987, I hereby approve the aforesaid Modified Mining Plan (including Progressive Mine Closure Plan). This approval is subject to the following conditions.

- (1) That this mining plan (including Progressive Mine Closure Plan) is approved without prejudice to any other laws applicable to the mine/area from time to time whether made by the Central Government, State Government or any other authority.
- (2) That this approval of Mining Plan (including Progressive Mine Closure Plan) does not in any way imply the approval of the Government in terms of any other provision of the Mines & Mineral (Development & Regulation) Act, 1957 or the Mineral Concession Rules, 1960 and the rules made thereunder.
- (3) That this Mining Plan (including Progressive Mine Closure Plan) is approved without prejudice to any order or direction from any court of competent jurisdiction.
- (4) Provisions of Mines Act, 1957 and Rules & Regulations made thereunder including submission of notice of opening, appointment of manager and other statutory officials as required by the Mines Act, 1952 shall be complied with.
- (5) The contents of Circular No. 2/2010 issued by the Chief Controller of Mines, Indian Bureau of Mines, Nagpur vide his letter No. 11013/3/MP/90-CCOM.Vol.VII dated 06.04.2010 shall be complied with.

-2-

- (6) The execution of mining plan/ scheme of mining shall be subjected to vacation of prohibitory orders/ notices, if any.
- (7) This approval of mining operations and associated activities is restricted to the mining lease area only. The mining lease area is as shown on the statutory plans under rule 28 of Mineral Conservation and Development Rules, 1988, by the lessee/RQP/applicant and Indian Bureau of Mines does not take any responsibility regarding correctness of the boundaries of the lease shown on the ground with reference to the lease map and other plans furnished by the applicant/lessee.
- (8) This approval is given for the received proposals as applicable from this date.
- (9) If anything is found to be concealed as required by the Mines Act in the contents of Mining Plan and the proposal for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect.
- (10) The next scheme of mining will be due for submission on 01.12.2017.
- (11) The financial assurance submitted should be renewed before expiry of the same.

Yours faithfully,

Encl. Copy of approved Mining Plan.
(including Progressive Mine Closure Plan)



(T.K. Rath)

Regional Controller of Mines

Copy for information to :

- 1) Shri K.Shankar, RQP, 49/23, Umapathy Street, West Mambalam, Chennai – 600 033.
- 2) The Commissioner of Geology & Mining, Government of Tamilnadu, Guindy, Chennai – 600 032 along with copy of the approved Scheme of Mining.

Encl. As above.


(T.K. Rath)

Regional Controller of Mines

**ENVIRONMENTAL CLEARANCE FROM MOEF&CC FOR
EXPANSION OF M.V. PURAM LIMESTONE MINE**

No. J-11015/6/99 – 1A II (M)
Government of India
Ministry of Environment & Forests

Paryavaran Bhawan,
C.G.O. Complex, Lodi Road,
New Delhi – 110 003

November 22, 1999

To

Shri N. Shanmugham
Vice President (Manufacturing),
Madras Cements Limited,
Ramasamyraja Nagar - 626 204
Kamarajar District Tamil Nadu

Subject: Expansion of M. V. Puram opencast captive limestone mine (capacity from 1,01,500 tonnes per annum to 4,06,300 tonnes per annum) by M/s Madras cements Limited at villages Sivalarpatti, District Thoothkudi, Tamil Nadu- environmental clearance reg.

Sir,

This has reference to the Environment and Forest Department, Government of Tamil Nadu letter no. 31876/Ec.III/98-1 dated 01.04.99 and subsequent communications from you dated 16.06.99 and 17.08.99 regarding environmental clearance of expansion of M. V. Puram opencast limestone mine. The Ministry of Environment & Forests has examined the application. It has been noted that the existing mining lease area is 103.54 ha. Additional mining lease area of 150.10 ha. has been obtained by the company. Targetted annual production of limestone will be raised from existing 1,01,500 tonnes to 4,06,300 tonnes. No forest land is involved. However, there are 331 land oustees from whom the land has been purchased. NOC from the State Pollution Control Board has been obtained. Indian Bureau of Mines has approved the mining plan. Public hearing was held on 24.06.98, when the project authorities assured to adopt the environmental protection and social welfare measures.

2. The Ministry of Environment & Forests hereby accords environmental clearance to the expansion of M. V. Puram opencast limestone mine (capacity from 1,01,500 tonnes per annum to 4,06,300 tonnes per annum) involving lease area of 150.10 ha in addition to the existing ML area of 103.54 ha. under the provisions of the Environmental Impact Assessment Notification, 1994 as amended on 04.05.94 and 10.04.97 subject to strict compliance of the following specific and general terms and conditions:

-2-

Specific conditions

- (i) The OB dumps should be stacked in earmarked dump sites only and should not be kept active for a long period. Inactive OB dumps should be scientifically vegetated with the suitable species to prevent surface run-off.
- (ii) Top soil should be stacked properly with adequate measures at earmarked site. It should be used for reclamation and rehabilitation of mined out areas.
- (iii) Garland drains of appropriate size should be constructed, to collect surface run-off from the OB & waste dump sites. The collected run-off should be diverted to the sedimentation tank before final disposal.
- (iv) A greenbelt of 30m width around the ML area by planting the native plant species in an area of 10.0 ha. should be raised in consultation with the local DFO / agriculture department. The density of the trees should be around 2000 plants per ha.
- (v) A detailed mine decommissioning plan should be submitted to the MoEF 5 years in advance for approval.
- (vi) Water conservation scheme should include water harvesting and recharging of the ground water.
- (vii) Fresh vibration study should be carried out by the project authorities and report submitted to the Ministry within six months time.
- (viii) Regional Environmental Impact Assessment study should be commissioned by the Department of Environment and Forests, Government of Tamilnadu to assess the cumulative impact of mining activities on the environment and proper management of degraded land by involving the mine owners in the region.

General conditions

- (i) No change in mining technology and working plan should be made without prior approval of the Ministry of Environment & Forests.
- (ii) No change in the calendar plan including excavation, quantum of limestone and wastes / overburden dumps should be made.
- (iii) Four ambient air quality monitoring stations should be established in the core zone as well as buffer zone for SPM, RPM, SO₂, NO_x, and CO monitoring. Location of the ambient air quality stations should be decided based on the meteorological data, topographical features, and environmentally sensitive targets in the consultation with the Tamil Nadu Pollution Control Board.

-3-

- (iv) Data on ambient air quality should be regularly submitted to this Ministry including its Regional office at Bangalore and the State Pollution Control Board / Central Pollution Control Board once in six months.
- (v) Fugitive emissions should be controlled, regularly monitored and data recorded properly.
- (vi) Adequate measures should be taken for control of noise levels below 85 dB in the work environment.
- (vii) Personnel working in dusty areas should wear personal protective equipment devices. Adequate training and information on safety and health aspects should be provided.

Occupational health surveillance programme of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed.

- (viii) Funds earmarked for environmental protection measures should be kept in a separate account and should not be diverted for other purposes and year-wise expenditure should be reported to the Ministry.
- (ix) The project will be monitored by the Regional Office of this Ministry located at Bangalore. The project authorities should extend full co-operation to the officer(s) of the Regional Office by furnishing the requisite data / information / monitoring reports.
- (x) The project authorities should have valid "consent to operate" and mining plan approval.
- (xi) The project proponent should inform the Regional Office located at Bangalore as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of land development work.

3. The above conditions will be enforced, inter-alia, under the provisions of the water (Prevention and Control of Pollution) Act, 1974. The Air (Prevention and Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and rules.

-4-

4. Failure to comply with any of the conditions mentioned above would result in withdrawal of environmental clearance.


(DR. P. L. AHUJARAI)
JOINT DIRECTOR



TOR FOR MELAVENKATESWARAPURAM LIMESTONE MINE, Annexure - 4
LEASE AREA - 103.53 HA

By Speed Post

No. J-11015/136/2013-IA.II (M)

Government of India
Ministry of Environment and Forests
IA Division

Paryavaran Bhavan,
C.G.O. Complex, Lodi Road,
New Delhi-110 003
Telefax: 011-24364067

Dated: 09th September, 2013

To

M/s Madras Cements Ltd.
"Auras Corporate Centre"
Vth Floor, 98-A Radhakrishnan Road,
Mylapore, Chennai-600004.

Ph.: 044-28478666, 28478656, Fax: 044-28478676
Email: hrd@madrascements.co.in

**Sub.: Melavenkateswarapuram Limestone Mine of M/s Madras Cements Ltd.,
located at Villages-Pudur, Nadukattur, Tehsil-Sennayampatti, Taluk-
Vilathikulam, Distt-Thoothukudi, Tamil Nadu (103.53ha) – Prescribing
TORs regarding.**

This has reference to your letter no. MCL-Mines-MV/13/01 dated 02.05.2013 regarding the proposal for determining the Terms of Reference (TORs) for undertaking detailed EIA study for the purpose of obtaining environmental clearance in accordance with the provisions of the EIA Notification, 2006. For this purpose, the Proponent had submitted information in the prescribed format (Form-1) along with a Pre-feasibility Report. The proposal was considered by the Reconstituted Expert Appraisal Committee in its 8th meeting held during June 26th-28th, 2013.

2. The proposal is for expansion of production from 0.101 MTPA to 0.50 MTPA (0.71 MTPA ROM) for Melavenkateswarapuram Limestone Mine of M/s Madras Cements Ltd., located at Villages-Pudur, Nadukattur, Tehsil-Sennayampatti, Taluk-Vilathikulam, Distt-Thoothukudi, Tamil Nadu.

3. Mine lease area is 103.53ha. Mining scheme and progressive mine closure plan for the period 2008-13 was approved by the IBM vide letter dated 26.09.2008. The method of mining is open cast mechanized and proposed to produce 0.71 million TPA ROM limestone. Life of mine will be 10 years. The drilling and blasting will be done for mining. Water requirement is 50m³/day. It is reported that no forest land is involved and all the land is Private Patta land and owned by the Madras Cement Land.

4. Based on the information content in the documents submitted and the presentation made before the Committee for mining projects, the following TORs are prescribed for undertaking detailed EIA study:-

Page 1 of 7

- 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 and mining technology and should be in the name of the lessee.
- 4) All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/toposheet 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) Does the company have 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.
- 6) 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.
- 7) 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.
- 8) 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.
- 9) 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.
- 10) 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) 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.
- 12) 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.
- 13) The vegetation in the RF / PF areas in the study area, with necessary details, should be given.
- 14) 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.
- 15) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, 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 State Wildlife Department/Chief Wildlife Warden under the Wildlife (Protection) Act, 1972 and copy furnished.
- 16) 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, 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 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.
- 17) Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravalli 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.
- 18) 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).
- 19) 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 located in the mine lease area will be shifted or not. The issues relating to shifting of Village including their R&R and socio-economic aspects should be discussed in the report.
- 20) One season (non-monsoon) primary baseline data on ambient air quality (PM_{10} ,

Page 3 of 7

SO₂ and NO_x), 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.

- 21) 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.
- 22) 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.
- 23) Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.
- 24) 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.
- 25) 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.
- 26) 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. 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.
- 27) 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.
- 28) 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.
- 29) 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.
- 30) 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.
- 31) Details of the onsite shelter and facilities to be provided to the mine workers

- should be included in the EIA report.
- 32) 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.
 - 33) 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.
 - 34) 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.
 - 35) 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.
 - 36) 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.
 - 37) Detailed environmental management plan 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.
 - 38) Public hearing points raised and commitment of the project proponent on the same along with time bound action plan to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.
 - 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) The cost of the project (capital cost and recurring cost) as well as the cost towards implementation of EMP should clearly be spelt out.
 - 41) Details of Transportation of mined materials as per the Indian Road Congress for both the ways (loaded as well as unloaded trucks) and its impact on Environment be provided.
 - 42) Studies by any reputed Institute on Cumulative impacts due to simultaneous mining by all the operating Mines in the Study area be conducted and a Report submitted.
 - 43) Status of the required Compliance Report from the Regional Office of MoEF.
5. 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) Where the documents provided are in a language other than English, an English translation should be provided.
 - d) The Questionnaire for environmental appraisal of industrial projects as

Page 5 of 7

- devised earlier by the Ministry shall also be filled and submitted.
- e) 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 also be followed.
 - f) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the F.R for securing the TOR) should be brought to the attention of MoEF 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.
 - g) As per the circular no. J-11011/618/2010-IA.II(I) dated 30.5.2012, you are requested to submit certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project by the Regional Office of Ministry of Environment & Forests, if applicable.
6. 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.
 7. The prescribed TORs would be valid for a period of two years for submission of the EIA/EMP reports, as per the O.M. No. J-11013/41/2006-IA.II(I) dated 22.3.2010.
 8. After preparing the draft EIA (as per the generic structure prescribed in Appendix- III of the EIA Notification, 2006) covering the above mentioned issues, the proponent will get the public hearing conducted and take further necessary action for obtaining environmental clearance in accordance with the procedure prescribed under the EIA Notification, 2006.


(Dr. Saroj)
Director


Copy to:-

- 1). **The Secretary**, Ministry of Mines, Government of India Shastri Bhawan, New Delhi.
- 2). **The Secretary**, Department of Environment, Government of Tamil Nadu, Chennai.
- 3). **The Secretary**, Department of Forests, Government of Tamil Nadu, Chennai
- 4). **The Secretary**, Department of Mines and Geology, Government of Tamil Nadu, Chennai
- 5). **The Chief Conservator of Forests**, Regional Office (SZ), Kendriya Sadan, 4th Floor E&F, Wings 17th Main Road, 1 Block, Koramangala, Bangalore-560 034.
- 6). **The Chairman**, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai- 600 032, Tamil Nadu.

Page 6 of 7



- 7). **The Member Secretary**, Central Ground Water Authority, A2, W- 3 Curzon Road Barracks, K.G. Marg, New Delhi-110001.
- 8). **The Controller General**, Indian Bureau of Mines, Indira Bhavan, Civil Lines, Nagpur- 440 001.
- 9). **The District Collector**, Thoothukudi District, Government of Tamil Nadu.
- 10). **Guard File.**
- 11). **MoEF Website.**


(Dr. Saroj)
Director

**AMENDED TOR FOR MELAVENKATESWARAPURAM LIMESTONE
MINE, LEASE AREA – 98.62 HA**

Annexure - 5

By Speed Post

No. J-11015/136/2013-IA.II (M)
Government of India
Ministry of Environment, Forest & Climate Change
Impact Assessment Division

Indira Paryavaran Bhavan,
Vayu Wing, 3rd Floor, Aliganj,
Jor Bagh Road, New Delhi-110 003
Telefax: 24695304

Dated: 12th June, 2015

To,
M/s Madras Cements Ltd.
"Auras Corporate Centre"
Vth Floor, 98-A Radhakrishnan Road,
Mylapore, Chennai-600004.

Ph.: 044-28478666, 28478656, Fax: 044-28478676
Email: hrd@madrascements.co.in

**Sub.: Melavenkateswarapuram Limestone Mine of M/s Madras Cements Ltd.,
located at Villages-Pudur, Nadukattur, Tehsil-Sennayampatti, Taluk-
Vilathikulam, Distt-Thoothukudi, Tamil Nadu (98.62ha)- Amendments in
TOR regarding.**

Sir

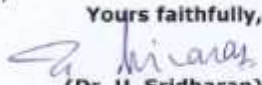
This has reference to your above mentioned proposal for M/s Madras Cements Ltd., for Melavenkateswarapuram Limestone Mine with enhancement of production capacity from 0.101 million TPA to 0.50 million TPA (ROM), located at Villages-Pudur, Nadukattur, Tehsil-Sennayampatti, Taluk-Vilathikulam, Distt-Thoothukudi, Tamil Nadu

2. The Proposal of amendments in TOR was appraised by the Reconstituted Expert Appraisal Committee in its 32nd meeting held during April 29-30, 2015. Based on the information furnished and presentation made by the Project Proponent and discussions held, the Committee recommended the amendments in TOR with respect to mine lease area from 103.53ha to 98.62ha as the mining lease has been renewed by State Govt. vide letter dated 17.11.2014 for a period of 20 years i.e. from 29.07.2003 to 28.07.2023 for an area of 98.62ha.

3. Your request for amendments to the Terms of References has been examined in the Ministry and the said **Terms of Reference letter of even no. dated 09.09. 2013 has been amended w.r.t. lease area that is from 103.53ha to 98.62ha.**

4. All other terms and conditions mentioned in this Ministry's letter of even no dated 09.09.2013 shall remain the same.


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

Yours faithfully,

(Dr. U. Sridharan)
Director(S)

Copy to:-

- 1). **The Secretary**, Ministry of Mines, Government of India Shastri Bhawan, New Delhi.
- 2). **The Secretary**, Department of Environment, Government of Tamil Nadu, Chennai.

- 3). **The Secretary**, Department of Forests, Government of Government of Tamilnadu, Chennai
- 4). **The Secretary**, Department of Mines and Geology, Government of Tamilnadu, Chennai
- 5). **The Additional Principal Chief Conservator of Forests**, Ministry of Environment, Forest and Climate Change, Regional Office (SEZ), Ist and IInd Floor, Handloom Export Promotion Council, 34, Cathedral Garden Road, Nungambakkam, Chennai – 34
- 6). **The Chairman**, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai- 600 032, Tamil Nadu.
- 7). **The Member Secretary**, Central Ground Water Authority, A2, W- 3 Curzon Road Barracks, K.G. Marg, New Delhi-110001.
- 8). **The Controller General**, Indian Bureau of Mines, Indira Bhavan, Civil Lines, Nagpur- 440 001.
- 9). **The District Collector**, Thoothukudi District, State of Tamil Nadu.
- 10). **Guard File.**
- 11). **MOEFCC Website.**


(Dr. U. Sridharan)
Director(S)



**EXTENSION FOR VALIDITY OF TOR FOR MELAVENKATESWARAPURAM
LIMESTONE MINE, LEASE AREA – 98.62 HA**

By Speed Post

No. J-11015/136/2013-IA.II (M)

Government of India
Ministry of Environment, Forest & Climate Change
Impact Assessment Division

Indira Paryavaran Bhavan,
3rd Floor, Vayu Wing, Aliganj,
Jor Bagh Road, New Delhi-110 003

Dated: 17th September, 2015

To,

M/s Ramco Cements Ltd.,
Auras Corporate Centre, V Floor
98-A, Dr. Radhakrishnan Salai,
Mylapore, Chennai – 600004

Tel. 044-28478666; Fax: 044-28478676

**Sub.: Melavenkateswarapuram Limestone Mine withenhancement of
production capacity from 0.101 million TPA to 0.50 million TPA
(0.72 million TPA (ROM) by M/s Ramco Cements Ltd., located at
Village(s)-Pudur, Nadukattur, Tehsil-Sennayampatti, Taluk-
Vilathikulam, Distt-Thoothukudi, Tamil Nadu (98.62ha)- Extension
of validity of TOR and corrigendum**

Sir,


This has reference to your letter dated 15.07.2015, requesting for
corrigendum w.r.t. ROM to 0.72 million TPA (ROM) and extension of validity of
TOR, as the submission of final EIA report was delayed due to delay in
conducting the Public Hearing. The Ministry prescribed TOR vide letter of even
No., dated 09.09.2013,

2. The proposal was considered by the Reconstituted Expert Appraisal
Committee in its 37th meeting held during August 25-27, 2015. Based on the
information furnished and discussions held, the Committee **recommended**
extension of the validity of TOR for one year i.e. **from 09.09.2015 to
08.09.2016** for submission of Final EIA/EMP reports and also the proposed
enhancement of production capacity from **0.101 million TPA to 0.50 million
TPA (0.72 million TPA (ROM)) of limestone** for consideration of
environmental clearance.

3. All other terms and conditions mentioned in the TOR letter of even No.
dated 09.09.2013 shall remain the same.

4. This issues with the approval of Competent Authority.

Yours faithfully,


(Dr. U. Sridharan)
Director (S)

Copy to:

1). **The Secretary**, Ministry of Mines, Government of India Shastri Bhawan,
New Delhi.

Page 1 of 2

- 2). **The Secretary**, Department of Environment, Government of Tamil Nadu, Chennai.
- 3). **The Secretary**, Department of Forests, Government of Government of Tamil Nadu, Chennai
- 4). **The Secretary**, Department of Mines and Geology, Government of Tamil Nadu, Chennai
- 5). **The Additional Principal Chief Conservator of Forests**, Ministry of Environment, Forest and Climate Change, Regional Office (SEZ), Ist and IInd Floor, Handloom Export Promotion Council, 34, Cathedral Garden Road, Nungambakkam, Chennai – 34 Tamil Nadu
- 6). **The Chairman**, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai- 600 032, Tamil Nadu.
- 7). **The Member Secretary**, Central Ground Water Authority, A2, W- 3 Curzon Road Barracks, K.G. Marg, New Delhi-110001.
- 8). **The Controller General**, Indian Bureau of Mines, Indira Bhavan, Civil Lines, Nagpur- 440 001.
- 9). **The District Collector**, Thoothukudi District, State of Tamil Nadu.
- 10). **Guard File.**
- 11). **MOEFCC Website.**


(Dr. U. Sridharan)
Director (S)

CONSENT ORDER FROM TNPCB

Annexure - 6



TAMILNADU POLLUTION CONTROL BOARD

CONSENT ORDER NO. 160815175580 DATED: 25/08/2016.

PROCEEDINGS NO.F.0162TTN/RS/DEE/TNPCB/TTN/W/2016 DATED: 25/08/2016

SUB: Tamil Nadu Pollution Control Board - RENEWAL OF CONSENT – M/s. THE RAMCO CEMENTS LIMITED , S.F.No. 24/1,2,26/1-4 Etc In Sennaiyampatti,86/2-10,87/1-8,88/1-3 Etc In Pudur,239/1,2,240/3-6,250/1 Etc In Naddukattur Village., Pudur Village, Vilathikulam Taluk and Thoothukudi District - Renewal of Consent for the operation of the plant and discharge of sewage and/or trade effluent under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 as amended in 1988 (Central Act 6 of 1974) – Issued- Reg.

REF: 1. Proceedings. No. T6/TNPCB/F-19497/RS/TTN/W&A/2008 dated 22.08.2008.
2. Proceedings. No. F.0162TTN/RS/DEE/TNPCB/TTN/W&A/2015 dated 23.09.2015.
3. IR.No : F.0162TTN/RS/AE/TTN/2016 dated 25/08/2016

RENEWAL OF CONSENT is hereby granted under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 as amended in 1988 (Central Act, 6 of 1974) (hereinafter referred to as "The Act") and the rules and orders made there under to

VICE CHAIRMAN

M/s. THE RAMCO CEMENTS LIMITED,

S.F.No. 24/1,2,26/1-4 ETC in SENNAIYAMPATTI,86/2-10,87/1-8,88/1-3 ETC in PUDUR,239/1,2,240/3-6,250/1 ETC in Naddukattur Village.,

Pudur Village ,

Vilathikulam Taluk ,

Thoothukudi District .

Authorising the occupier to make discharge of sewage and /or trade effluent.

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

This RENEWAL OF CONSENT is valid for the period ending March 31, 2017

R/hy 30/8/16
**District Environmental Engineer,
Tamil Nadu Pollution Control Board,
Thoothukudi**



TAMILNADU POLLUTION CONTROL BOARD

SPECIAL CONDITIONS

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

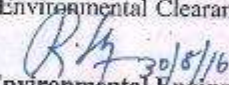
Sl. No.	Description	Quantity	Unit
Product Details			
1.	LIMESTONE- CLEAN (USABLE LIMESTONE)	0.101	MTPA

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

Outlet No.	Description of Outlet	Maximum daily discharge in KLD	Point of disposal
Effluent Type : Sewage			
1.	Septic Tank followed by Dispersion Trench	0.2	On Industrys own land
Effluent Type : Trade Effluent			

Additional Conditions:

- The unit shall not generate trade effluent at any stage of its manufacturing process under operation.
- The unit has to develop green belt around its boundary as per the Environment Management Plan and EC issued earlier.
- The unit shall not expand its mining capacity without obtaining valid Environmental Clearance and Consent of TNPC Board.


 District Environmental Engineer,
 Tamil Nadu Pollution Control Board,
 Thoothukudi

To
 VICE CHAIRMAN,
 M/s. THE RAMCO CEMENTS LIMITED,
 M.V.PURAM LIMESTONE MINES,
 Pin: 626204

Copy to:

- The Commissioner, Pudur-Panchayat Union, Vilathikulam Taluk, Thoothukudi District .
- Copy submitted to the Member Secretary, Tamil Nadu Pollution Control Board, Chennai for favour of kind information.
- Copy submitted to the JCEE-Monitoring, Tamil Nadu Pollution Control Board, Madurai for favour of kind information.
- File



TAMILNADU POLLUTION CONTROL BOARD

CONSENT ORDER NO. 160825175580

DATED: 25/08/2016.

PROCEEDINGS NO.F.0162TTN/RS/DEE/TNPCCB/TTN/A/2016 DATED: 25/08/2016

SUB: Tamil Nadu Pollution Control Board - RENEWAL OF CONSENT -M/s. THE RAMCO CEMENTS LIMITED , S.F.No. 24/1,2,26/1-4 ETC in Sennaiyampatti,86/2-10,87/1-8,88/1-3 Etc In Pudur,239/1,2,240/3-6,250/1 Etc In Naddukattur Village., Pudur Village, Vilathikulam Taluk and Thoothukudi District - Renewal of Consent for the operation of the plant and discharge of emissions under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 as amended in 1987 (Central Act 14 of 1981) -Issued- Reg.

REF: 1. Proceedings. No. T6/TNPCCB/F-19497/RS/TTN/W&A/2008 dated 22.08.2008.
2. Proceedings. No. F.0162TTN/RS/DEE/TNPCCB/TTN/W&A/2015 dated 23.09.2015.
3. IR.No : F.0162TTN/RS/AE/TTN/2016 dated 25/08/2016

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

VICE CHAIRMAN

M/s. THE RAMCO CEMENTS LIMITED,

S.F.No. 24/1,2,26/1-4 Etc In Sennaiyampatti,86/2-10,87/1-8,88/1-3 Etc In Pudur,239/1,2,240/3-6,250/1 Etc In Naddukattur Village.,

Pudur Village,

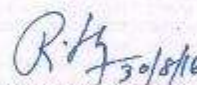
Vilathikulam Taluk,

Thoothukudi District.

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

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

This RENEWAL OF CONSENT is valid for the period ending March 31, 2017


District Environmental Engineer,
Tamil Nadu Pollution Control Board,
Thoothukudi


30/8/16



TAMILNADU POLLUTION CONTROL BOARD

SPECIAL CONDITIONS

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

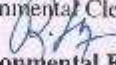
Sl. No.	Description	Quantity	Unit
Product Details			
1.	LIMESTONE- CLEAN (USABLE LIMESTONE)	0.101	MTPA

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

I Point source emission with stack :				
Stack No.	Point Emission Source	Air pollution Control measures	Stack height from Ground Level in m	Gaseous Discharge in Nm3/hr
II Fugitive/Noise emission :				
Sl. No.	Fugitive or Noise Emission sources	Type of emission	Control measures	
1.	Drilling & Blasting	Fugitive	Water sprinkler system	

Additional Conditions:

1. The unit shall carryout dust suppression activity efficiently and continuously so as to achieve the AAQ standards prescribed by the Board.
2. The unit has to ensure that operation of the unit shall not cause any damage to the surroundings.
3. The unit shall not expand its mining capacity without obtaining valid Environmental Clearance and Consent of TNPC Board.


District Environmental Engineer,
Tamil Nadu Pollution Control Board,
Thoothukudi


To
 VICE CHAIRMAN,
 M/s. THE RAMCO CEMENTS LIMITED,
 M.V.PURAM LIMESTONE MINES- Pin: 626204

Copy to:

1. The Commissioner, Pudur-Panchayat Union, Vilathikulam Taluk, Thoothukudi District.
2. Copy submitted to the Member Secretary, Tamil Nadu Pollution Control Board, Chennai for favour of kind information.
3. Copy submitted to the JCEE-Monitoring, Tamil Nadu Pollution Control Board, Madurai for favour of kind information.
4. File

COPY OF EXPLOSIVE LICENSE

Annexure - 7


GOVERNMENT OF INDIA
MINISTRY OF COMMERCE & INDUSTRY
PETROLEUM AND EXPLOSIVES SAFETY ORGANISATION (PESO)
(Formerly Department of Explosives)
A & D - Wing, Block 1-8, Hind Floor, Shastri Bhavan
26 Haddous Road, Nungambakkam, Chennai 600006
Tels: 28281023 Fax: 28284848
Email: jcccechennai@explosives.gov.in

No.: A/SC/TN/P3/9(A1136) Dated: 07/06/2016

To: **THE RAMCO CEMENTS LIMITED,**
Ramanasamy Raja Nagar, Virudhunagar, Tirunelveli - Ramanasamy Raja Nagar
District-VIRUDHUNAGAR, State-Tamil Nadu, Pincode - 626704

Subject: Licence to Possess for use of Ammonium Nitrate from a store house exceeding 30MT or in tanks situated at 367/8 Pandalgudi, Pandalgudi, Dist. VIRUDHUNAGAR, Tamil Nadu - Licence No.: A/SC/TN/P3/9(A1136) granted in Form P-3 of Ammonium Nitrate, 2012 - Change in Authorized Signatory/Occupier/Director

Sir(s),

Please refer to your letter No. dated 12/05/2016 on the subject cited above.

The Licence No.: A/SC/TN/P3/9(A1136) is duly amended in respect of:

Change in Authorized Signatory/Occupier/Director

and forwarded herewith:

The following are the names of the Authorized Signatory/Occupier/Director in the licence records.

No	Name
1)	S. Ramalingam (Occupier)
2)	P. Jagadish Babu (Authorized Signatory)
3)	S. Ramalingam (Director)


The Licence stands issued for the Licence to Possess for use of Ammonium Nitrate from a store house exceeding 30MT or in tanks of the following kinds and quantities of Ammonium Nitrate:

No	Explosive(s)	Capacity Per Month	Unit
1	Ammonium Nitrate (Solid)	40000	Kg

This Licence shall remain valid till 31st day of March 2019.

For further removal of licence, please follow the procedure under Rule 35(F) of Ammonium Nitrate, 2012. Receipt of this letter may please be acknowledged.

Enclosures:

Yours faithfully,

(PKumar)
Deputy Chief Controller of Explosives
For Joint Chief Controller of Explosives
South Circle, Chennai

Copy Forwarded to:

1. The Dy. Chief Controller of Explosives, Sivakasi.
2. District Magistrate, VIRUDHUNAGAR, Tamil Nadu with reference to his No: R.Ds(c)44463-2013 Dated: 26/12/2013.
3. Superintendent of Police, VIRUDHUNAGAR, Tamil Nadu



For Joint Chief Controller of Explosives
South Circle, Chennai

[For more information regarding status, fees and other details, please visit our web site <http://pan.peso.in>]

LICENCE FORM P-3
(See Sr.No.-3 of Schedule 1 and rule 35 of Ammonium Nitrate Rules, 2012.)

Licence to Possess for use of Ammonium Nitrate from a store house exceeding 30MT or

Licence No. : A/SC/TN/P3/HA1136
Annual Fee Rs. 1000/-


- Licence is hereby granted to : **M/s. THE RAMCO CEMENTS LIMITED (Occupier : S. Ramalingam)**
Ramassamy Raja Nagar, Virudhunagar, Town/Village - Ramassamy Raja Nagar
District-VIRUDHUNAGAR, State-Tamil Nadu, Pincode - 626204
Phone -04562 256201, Email-admin@ramcocements.co.in, Fax-04562 256268
- Status of licence holder: **Company**
- Licence is valid only for the following purpose : **Licence to Possess for use of Ammonium Nitrate from a store house exceeding 30MT or in tanks**
- Licence is valid for the following quantity of Ammonium Nitrate:

Name and Description	Quantity at a time (Kg.)	Quantity of Ammonium Nitrate to be purchased in a financial Year (Kg.)
Ammonium Nitrate (Solid)	40000	480000

- The licensed premises shall conform to the following drawing(s):
Drawing No : A/SC/TN/P3/HA1136 dated : 03/01/2014
- The Licensed premises are situated at following address:
Survey No. 367/8 Pandalgudi, Town/Village : Pandalgudi
Police Station : Vachakurapatti District : VIRUDHUNAGAR State : Tamil Nadu
Pin/Code : 626204 Phone : 256268 E-Mail : Fax : 256268
- The licensed premises consist of following facilities :
One store house for Ammonium Nitrate
- The licence is granted subject to the provision of Explosives Act 1884 as amended from time to time and the Ammonium Nitrate Rules, 2012 framed there under and the conditions, additional conditions and Annexures.
(i) Drawings (showing site, constructional and other details) as stated in serial No. 5 above.
(ii) Conditions and Additional Conditions of this licence signed by the licence issuing authority.
- This licence shall remain valid till **31st day of March 2015**

This licence is liable to be suspended or revoked for any violation of the Explosives Act 1884 or Ammonium Nitrate Rules, 2012 framed there under or the conditions of this licence, if the licensed premises are not found conforming to the description shown in the plans and annexure attached hereto.

The Date: 03/01/2014


Joint Chief Controller of Explosives
 South Circle, Chennai

Amendments :

- Change in Authorized Signatory/Occupier/Partner/Directory dated : 04/08/2014
- Amendment of Quantity of Ammonium Nitrate dated : 04/08/2014
- Change in Authorized Signatory/Occupier/Partner/Directory dated : 07/06/2015

Transfers :

- Change in Licensee Name/Address/Status dated : 04/08/2014

Endorsement for renewal of licence:

Date of Renewal	Date of Expiry	Signature of licensing authority
04/05/2015	31/03/2019	Sd/- B. Chief Controller of Explosives, South Circle, Chennai

Statutory Warning : Misuse of Ammonium Nitrate shall constitute serious criminal offence under the law.

Conditions

The following are the conditions of licence number A/SC/TN/P3/9(A1136) to Licence to Possess for use of Ammonium Nitrate from a store house exceeding 30MT or in tanks in Form P-3 [Sr. No. -3] granted by the Chief Controller or Controller of Explosives.

1. The Ammonium Nitrate shall be possessed only in the licensed storehouse or melt storage tank shown in the approved plan attached with the License.
2. The quantity of Ammonium Nitrate in the premises or any part thereof shall not exceed at any one time the quantity for which License has been issued.
3. Spilled or sweepings of Ammonium Nitrate the waste Ammonium Nitrate collected from sweeping or spilled shall be destroyed by the License holder and account thereof shall be maintained indicating the quantity of the Ammonium Nitrate destroyed.
4. The License holder and every person employed shall take all due precautions for prevention of accidents by fire or explosion in the licensed premises and for preventing unauthorized person from having access to licensed premises and shall abstain from any act from whatsoever which tends to cause or explosion and is not reasonably necessary for the purpose of works related thereto.
5. No additions and alterations shall be carried out in the licensed premises without a previous sanction in writing of the Licensing Authority. Such additions and alterations so sanctioned shall be shown in the amended plan attached to the License.
6. The License holder shall appoint a competent person to supervise the operations shall be conducted under the supervision of the competent person.
7. Free access to the licensed premises shall be given at all reasonable times to any inspecting or sampling officer and all facilities shall be offered to the officer for ascertaining that the provisions of the Act and these rules and the safety conditions are duly observed.
8. If the License issuing authority or the inspecting officer informs in writing, the holder of the License to execute any repairs or to make any additions or alterations to the licensed premises or carry out recommendations, which are in the opinion of such authority may pose unacceptable risk and therefore the same is necessary for the safety or security of the premises or persons, the holder of the License shall execute the recommendations and report compliance within the period specified by such authority.
9. Accidents by fire or explosion and losses, shortage or theft of Ammonium Nitrate shall be immediately reported to the nearest police station and the District Authority.
10. License holder shall maintain records in the prescribed forms specified in Schedule II Part 3 to ensure accountability, identification and traceability of Ammonium Nitrate and shall produce such records on demand to authority specified in rule 50.
11. The License holder shall submit monthly returns of AN received, sold /used/stolen or short received and destroyed in the form prescribed in Form R-9 of Part 3 of Schedule II so as to reach Licensing Authority and District Authority within 10th day of every succeeding month.


 For Joint Chief Controller of Explosives
 South Circle, Chennai

Renewal Covering Letter

Page 1 of 2



भारत सरकार | Government of India
वाणिज्य और उद्योग मंत्रालय | Ministry of Commerce & Industry
पेट्रोलियम तथा विस्फोटक सुरक्षा संगठन (पेसो) | Petroleum & Explosives Safety Organisation (PESO)
पूर्व नाम: विस्फोटक विभाग | Formerly: Department of Explosives
A और D - विंग, ब्लॉक 1-8, दूसरा तल, शांति भवन | A & D - Wing, Block 1-8, 2nd Floor, Shanti Bhavan
26 इंदिरा पार्क रोड, मंगलबक्का चेन्नई | 26 Indira Park Road, Mangalbakam Chennai-600066
फोन | (Phone): 28281023 | फैक्स | (Fax): 28284848
ई-मेल | Email: jnc@chemexplosives.gov.in

संदर्भ (No.): E/HQ/TN/22/123(E35889)

दिनांक (Date): 07/06/2016

सेवा में | To,

M/s. The Ramco Cements Limited,
Ramanathapuram Nagar, PS Pachahattham, Town Village - Ramanathapuram Nagar
Distric-3 BRUDHUNAGAR, State-Tamil Nadu, Pincode - 626204

विषय: Survey No(s) 8/2, वार्ड THUMMOKUNDU, जिला RAMANATHAPURAM, राज्य Tamil Nadu में विस्फोटक के मैगजीन में उपयोग के लिए बकाया हेतु विस्फोटक नियम, 2008 के अंतर्गत LE-3 में जारी अनुमति से E/HQ/TN/22/123(E35889) के नवीनीकरण संबंध में।

Subject: Possession for Use of of Explosives from magazine situated at Survey No(s) 8/2, THUMMOKUNDU, Dist. RAMANATHAPURAM, Tamil Nadu - Licence No.: E/HQ/TN/22/123(E35889) granted in Form LE-3 of Explosives Rules, 2008 - Renewal regarding

महोदय | Sir,

आपका उपरोक्त विषय पर सब्सक्रिप्शन दिनांक 22/12/2015 का संदर्भ ग्रहण करें। विस्फोटक नियम, 2008 के अंतर्गत प्रारूप LE-3 में जारी अनुमति दिनांक 31/03/2020 तक नवीनीकरण कर इस पर के समय भेजी जा रही है।
Reference to your letter No.: x dated: 22/12/2015, the subject licence duly renewed upto 31/3/2020 and issued in Form LE-3 of Explosives Rules, 2008 is forwarded herewith.

अनुमति के आगामी नवीकरण हेतु कृपया निम्नलिखित दस्तावेज दिनांक 31/03/2020 से पहले उप मुख्य विस्फोटक निबंधक निवासी को भेजे जाएं।
For further renewal of licence, please submit the following documents so as to reach The Dy. Chief Controller of Explosives, Sivakasi on or before 31/3/2020

- प्रारूप आरई-1 में विधिवत पूरी एवं हस्ताक्षरित आवेदन।
Application in Form RE-1 duly filled in and signed.
- एक से पांच वर्ष के अनुमति शुल्क का बैंक ड्राफ्ट बैंक ऑफ इंडिया की राष्ट्रीयकृत बैंक के नाम आहरित, संयुक्त मुख्य विस्फोटक निबंधक, चेन्नई के पक्ष में चेन्नई में देय हो।
Licence fees for one to five years in the form of demand draft drawn on any Nationalized Bank in favour of Jt. Chief Controller of Explosives, Chennai payable at Chennai.
- अनुमति पत्राज के साथ मूल अनुमति।
Original licence with approved plan.
- कृपया इस संबंध में विस्फोटक नियम, 2008 के नियम 112 का भी संदर्भ ग्रहण करें।
In this connection, please also refer to Rule 112 of Explosives Rules, 2008.
- विस्फोटक के क्रय हेतु आरई-11 में मांगपत्र (ड्राफ्ट) आवेदनकर्ता को दिया जाए और उसी की एक प्रति इस कार्यालय को भेजी जाए (आतिथ्यावसी मांगपत्र के लिए लागू नहीं)।
Indem for purchase of explosives shall be placed in RE-11 with the supplier and copy of the same shall be sent to this office. (Not applicable for fireworks store house)
- कृपया विस्फोटक की वार्षिक विवरण हर दोमाही के अंत में आरई-7 में प्रस्तुत की जाए। विवरणों उप मुख्य विस्फोटक निबंधक निवासी के कार्यालय में आगामी तिमाही के 10 तारीख से पहले पहुंच जानी चाहिए (आतिथ्यावसी मांगपत्र के लिए लागू नहीं)। Please submit quarterly returns of explosives in RE-7 at the end of every quarter so as to reach The Dy. Chief Controller of Explosives, Sivakasi by 10th of the succeeding quarter. (Not applicable for fireworks store house)
- सभी ब्लॉकिंग ऑपरेशन एक सक्षम इंसान की जांचगी जो उपरोक्त नियमों के तहत एक डीप शॉट कायर प्रमाणपत्र धारक हो।
होजरिंग, ब्लॉकिंग ऑपरेशन 1952 के अधिन आने वाले सभी ने ब्लॉकिंग ऑपरेशन करने वाले ऑपरेटर की योग्यता उसी अधिनियम से निर्धारित हो।
All blasting operations shall be carried out by a competent person holding a valid shot firer's permit granted under above rules. However, blasting operations in mines coming under the purview of the Mines Act 1952, the blaster shall have qualifications prescribed in the regulations framed under the said Act.

<http://10.0.1.13/IntExp/RNcoveringLetterHindi.asp>

6/7/2016

Renewal Covering Letter

Page 2 of 2

आपके खाते में रुपय 17100/- की राशि शेष है जो इस तदर्थ को उद्घृत करते हुए भविष्य के संव्यवहार में समायोजित की जा सकती है।
An amount of Rs. 17100/- balance is in your credit, which may be utilized for future transaction by quoting this reference.

भवदीय | Your's faithfully

(पी.कुमार | P.Kumar)

उप मुख्य विस्फोटक नियंत्रक | Deputy Chief Controller of Explosives
कृते संयुक्त मुख्य विस्फोटक नियंत्रक | For Joint Chief Controller of Explosives
दक्षिणार्चल, चेन्नई | South Circle, Chennai

प्रतिलिपि भेजित | Copy Forwarded to:

1. जिला मजिस्ट्रेट (District Magistrate), RAMANATHAPURAM (Tamil Nadu)- सूचना के लिए (for information.)
कृते संयुक्त मुख्य विस्फोटक नियंत्रक | For Joint Chief Controller of Explosives
दक्षिणार्चल, चेन्नई | South Circle, Chennai

(अधिक जानकारी जैसे आवेदन की स्थिति, शुल्क आदि के लिए हमारी वेबसाइट <http://peso.gov.in> देखें।)
(For more information regarding status, fees and other details please visit our website <http://peso.gov.in>)

<http://10.0.1.13/IntExp/RNCoveringLetterHindi.asp>

6/7/2016

अनुमति प्रारूप एल. ई.-3 | LICENCE FORM LE-3

(विस्फोटक नियम, 2008 की अनुसूची 4 के भाग 1 के अनुच्छेद 3(क) में (क) देखिए।)
(See article 3(a) to (d) of Part 1 of Schedule IV of Explosives Rules, 2008)

(ग) उपयोग के लिए एक समय पर वर्ग 1, 2, 3, 4, 5 या वर्ग 7 के विस्फोटक या किसी संयोजन में वर्ग 6 के

अनुमति

Licence to possess : (c) for use, explosives of class 1, 2, 3, 4, 5, 6 or 7 in a magazine

अनुमति नं. (Licence No.) : E/HQ/TN/22/133(E35889)

वार्षिक फीस रुपये (Annual Fee Rs): 22000/-



1. Licence is hereby granted to:

M/s. The Ramco Cements Limited (अभिधीयी / Occupier : S. Ramalingam), Ramasamy Raju Nagar, PS Vachakurupatti, Town/Village : Ramasamy Raju Nagar, District-VIRUDHUNAGAR, State-Tamil Nadu, Pincode - 626204

को अनुमति अनुमति की जाती है।

2. अनुमतिधारी की पंजीकृत स्थिति : Status of licensee : Company

3. अनुमति निम्नलिखित प्रयोजनों के लिए विधिवत है।

Licence is valid only for the following purpose:

possession for use of Nitrate Mixture, Safety Fuse, Detonating Cord, Detonators, Cord Relay, के उपयोग के लिए

4. अनुमति विस्फोटकों के निम्नलिखित प्रकार, प्रकार और मात्रा के लिए विधिवत है।

Licence is valid for the following kinds and quantity of explosives: - (क) (a)

क्र. सं.	नाम और विवरण	कक्षा और विभाग	उप-विभाग	मात्रा (किसी एक समय में)
Sr. No.	Name and Description	Class & Division	Sub-division	Quantity at any one time
1.	Nitrate Mixture	2, 0	0	25000 Kg.
2.	Safety Fuse	6, 1	0	10000 Mtrs.
3.	Detonating Cord	6, 2	0	20000 Mtrs.
4.	Detonators	6, 3	0	15000 Nos.
5.	Cord Relay	6, 4	0	2500 Nos.

(क) किसी एक बार में मात्रा से अधिक मात्रा में विस्फोटक की मात्रा (अनुच्छेद 3(ख) और (ग) के अधीन अनुमति के लिए)

(b) Quantity of explosives to be purchased in a calendar month (applicable for license under article 3(b) and (g))

3 times as above.

5. निम्नलिखित रेखाचित्र (रेखाचित्र) से अनुमति परिसर की पुष्टि होती है।

रेखाचित्र नं. (Drawing No.) : E/HQ/TN/22/133(E35889)

The licensed premises shall conform to the following drawing(s):

दिनांक (Dated): 18/07/1979

6. अनुमति परिसर निम्नलिखित पते पर स्थित है। The licensed premises are situated at following address:

Survey No(s): 8/2, ग्राम (Town/Village): THE MMOKUNDU

जिला (District): RAMANATHAPURAM

राज्य (State): Tamil Nadu

पुलिस थाना (Police Station): Pandalkudi

पिनकोड (Pincode):

फोन (Fax):

7. अनुमति परिसर में निम्नलिखित सुविधाएं उपलब्ध हैं।

The licensed premises consist of following facilities:

: a main magazine room, a lobby and a detonator storage room

8. अनुमति समग्र - समग्र पर ब्याप्तविधि विस्फोटक अधिनियम, 1884 और उसके अधीन विरचित विस्फोटक नियम, 2008 के उपबन्धों, शर्तों और अतिरिक्त शर्तों और निम्नलिखित अपाच्छेदों के अधीन रहते हुए अनुमति की जाती है।

The licence is granted subject to the provision of Explosives Act 1884 as amended from time to time and the Explosives Rules, 2008 framed there under and the conditions, additional conditions and the following Annexures.

1. उपर्युक्त क्रम सं 5 में दत्त अधिलेखित रेखाचित्र (स्थान, संरचनात्मक संस्था और अन्य विवरण दर्शाते हुए)।

Drawings (showing site, constructional and other details) as stated in serial No. 5 above.

2. अनुमति अधिकारी द्वारा हस्ताक्षरित इस अनुमति की शर्तों और अतिरिक्त शर्तों।

Conditions and Additional Conditions of this licence signed by the licensing authority.

3. दूरी प्रारूप DE-2 (Distance Form DE-2).

9. यह अनुमति तारीख 31 मार्च 2008 तक विधिवत रहेगी। This licence shall remain valid till 31st day of March 2008.

यह अनुमति अधिनियम या उसके अधीन विरचित नियमों या अनुसूची V के भाग 2 के प्रति निर्दिष्ट सेट-VII के अधीन तथा

उपबन्धित इस अनुमति की शर्तों का अभिज्ञान करने या यदि अनुमति परिसर योजना या इससे सम्बन्धित अपाच्छेदों में दत्त विवरण के अनुसार नहीं पाए जाते या निरूपित या प्रतिलिखित की जा सकते हैं, जहां यह लागू हो।

This licence is liable to be suspended or revoked for any violation of the Act or Rules framed there under or the conditions of this licence as set forth under Set VII, wherever applicable, referred to in Part 4 of Schedule V or if the licensed premises are not found conforming to the description shown in the plans and Annexure attached hereto.

तारीख : The Date - 18/07/1979

SE-

Page 2 of 2

मुख्य विस्फोटक नियंत्रक | Chief Controller of Explosives

Amendments :

- Change in Authorized Signatory/Occupier/Partners/Directors dated : 10/11/2015

Transfers :

- Change in Licensee Name/Address/Status dated : 22/08/2014

नवीनीकरण के पृष्ठोपकरण के लिए स्थान
Space for Endorsement of Renewal

नवीनीकरण की तारीख Date of Renewal	समाप्ति की तारीख Date of Expiry	अनुमोदन प्राधिकारी के हस्ताक्षर और स्टाम्प Signature of licensing authority and stamp
07/06/2016	31/03/2020	R. Chief Controller of Explosives, South Circle, Chennai

कानूनी चेतावनी : विस्फोटकों को गलत ढंग से चलाते या उनका दुरुल्लेख विधि के अधीन गंभीर दण्डित अपराध होगा।
Statutory Warning : Mishandling and misuse of explosives shall constitute serious criminal offence under the law.

<http://10.0.1.13/IntExp/ExplosivesLicenceLE3Hindi.asp> 6/7/2016



**GOVERNMENT OF INDIA
MINISTRY OF COMMERCE & INDUSTRY
PETROLEUM AND EXPLOSIVES SAFETY ORGANISATION (PESO)
(Formerly Department of Explosives)
No.140, Rokmini Laxmipati Road,
Marshalls Road, Egmore, Chennai 600008
Tele: 28514848 Fax: 28514848
Email: jtccechennai@explosives.gov.in**

No.: E/SC/TN/38/7(E22194)

Dated: 04/08/2014

To,
M/s. The Ramco Cements Limited,
Ramasamy Raja Nagar Post, Town/Village - Ramasamy Rajanagar
District-VIRUDHUNAGAR, State-Tamil Nadu, Pincode - 626113

Subject: Manufacturing of ANFO situated at Survey No(s): NO.367, PANDALGUDI, Dist.
VIRUDHUNAGAR, Tamil Nadu - Licence No.: E/SC/TN/38/7(E22194) granted in Form LE-1 of
Explosives Rules, 2008 -
Change in Licensee Name/Address/Status
Change in Authorized Signatory/Occupier.

Sir(s),

Please refer to your letter No. x dated 31/01/2014 on the subject cited above.

The following changes are effected in licence No.: E/SC/TN/38/7(E22194) with respect to the subject below.
Change in Licensee Name/Address/Status
Change in Authorized Signatory/Occupier.

The subject license is transferred from M/S MADRAS CEMENTS LTD. to M/s. The Ramco Cements Limited.

The names of the Authorized Signatory/Occupier in Licence records are noted below:

No. Name

- 1) S. Ramalingam (Authorized Signatory) ✓
- 2) S. Ramalingam (Occupier) ✓

The licence capacity at any one time shall not exceed the kinds and quantities mentioned below :

No.	Explosive(s)	Class	Div	Sub Div	Capacity	Unit
1	ANFO	2	0	0	100	Kg.

This Licence shall remain valid till 31st day of March 2018.

An amount of Rs. 501/- balance is in your credit, which may be utilized for future transaction by quoting this reference.

For further renewal of licence, please follow the procedure under Rule 112 of Explosives Rules, 2008.
Receipt of this letter may please be acknowledged.

Enclosures :

Yours faithfully,

(C Shanmugam)
Controller of Explosives
For Joint Chief Controller of Explosives

Transferred from M/S MADRAS CEMENTS LTD.

LICENCE FORM LE-1

(See article 1(d) of Schedule IV of Explosives Rules, 2008)

Licence to manufacture : (d) ANFO explosives not exceeding 200 kilogrammes at a

Licence No. : E/SC/TN/38/7(E22194)
Annual Fee Rs:1000/-



1. Licence is hereby granted to : **M/s.The Ramco Cements Limited (Occupier : S.Ramalingam)
RamaSamy Raja Nagar Post, Town/Village - RamasamyRajanagar
District-VIRUDHUNAGAR, State-Tamil Nadu, Pincode - 626113**

2. Status of licensee : **Company**
3. Licence is valid only for the following purpose : **manufacture of ANFO**
4. Licence is valid for the following kinds and quantity of explosives:

Sr. No.	Name and Description	Class & Division	sub-division(If any)	Quantity at any one time
1.	ANFO	2,0	0	100 Kg.

5. The licensed premises shall conform to the following drawing(s):
Drawing No : E/SC/TN/38/7(E22194) dated : 04/08/2014
6. The licensed premises are situated at following address:
**Survey No(s). NO.367 , Town/Village : PANDALGUDI
Police Station : PANDALGUDI District : VIRUDHUNAGAR State : Tamil Nadu
PinCode : Phone : E-Mail : Fax :**
7. The licensed premises consist of following facilities : **ANFO shed.**
8. The licence is granted subject to the provision of Explosives Act 1884 as amended from time to time and the Explosives Rules, 2008 framed there under and the conditions, additional conditions and Annexures.
(1) Drawings (showing site, constructional and other details) as stated in serial No. 5 above,
(2) Conditions and Additional Conditions of this licence signed by the licensing authority,
(3) Annexure
9. This licence shall remain valid till **31st day of March 1989**.

This licence is liable to be suspended or revoked for any violation of the Act or Rules framed there under or the conditions of this licence as set forth under Set III, wherever applicable, referred to in Part 4 of Schedule V or if the licensed premises are not found conforming to the description shown in the plans and Annexure attached hereto.

The Date: 14/07/1987


Joint Chief Controller of Explosives
South Circle, Chennai

Transfers :

- Change in Licensee Name/Address/Status dated : 04/08/2014
- Change in Authorized Signatory/Occupier/Partners/Directors dated : 04/08/2014

Endorsement for renewal of licence:

Date of Renewal	Date of Expiry	Signature of licensing authority
11/06/2013	31/03/2018	Sd/- Dy. Chief Controller of Explosives, Sivakasi

(Set III)

The following are the conditions of licence number E/SC/TN/38/7(E22194) for manufacture of ANFO explosives in Form LE-1 [article 1(d)] granted by Controller or Controller of Explosives.




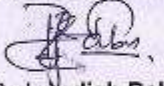
1. The quantity of ANFO explosives in the premises or any part thereof shall not exceed at any one time the quantity for which licence has been issued.
2. The ANFO manufacturing shed shall be protected by a fencing at a distance of 15 metres and it shall maintain safety distance from protected works as specified in table 1 of Schedule VIII.
3. Work in the shed shall be carried out strictly in accordance with the laid down safe working procedures and instructions.
4. The ANFO explosives shall be manufactured under the immediate supervision of a qualified responsible person appointed by the licensee.
5. The licensee and every person employed shall take all due precautions for the prevention of accidents by fire or explosion, in the place or places where the ANFO explosives is manufactured, handled or used.
6. All spillage of ANFO explosive shall be collected and destroyed at a safe place away from the licensed premises under the supervision of experienced person.
7. All containers and mixers used for manufacturing the ANFO explosive shall after use, be thoroughly cleaned with suitable detergent solution and washed with water.
8. The licensee and the employee shall be conversant with procedure to be taken during the emergency within the premises.
9. Free access to the licensed premises shall be given at all reasonable times to any inspecting or sampling officer and every facility shall be afforded to the officer for ascertaining that the provisions of the Act and these rules and the safety conditions are duly observed.
10. If the licensing authority or a Controller of Explosives informs in writing, the holder of the licence to execute any repairs or to make any additions or alterations to the licensed premises or machinery, tools or apparatus or carry out recommendations, which are in the opinion of such authority may pose unacceptable risk and so necessary for the safety of either on-site or off-site of the premises or persons, the holder of the license shall execute the recommendations and report compliance within the period specified by such authority.
11. Accidents by fire or explosion and losses, shortage or theft of explosives shall be immediately reported to the nearest police station and the licensing authority and local office of the licensing authority.


For Joint Chief Controller of Explosives
South Circle, Chennai



ENVIRONMENTAL STATEMENT FORM

Annexure- 8

 THE RAMCO CEMENTS LIMITED (formerly known as Madras Cements Ltd.,)	 ISO 9001 Certified Company	 ISO 14001 Certified Company	<p>Ramasamyraja Nagar Veedhuhager (Dist) Tamil Nadu – 625 204 Phone: STD 04562 256201, 02, 03 & 256241 Fax: 04562-256268 Email: admin@ramcocements.co.in</p>
12.09.2016			
<p>To The District Environmental Engineer, Tamilnadu Pollution Control Board, C7,C9 Sipcot Industrial Estate, Meelavittan, Thoothukudi District.</p>			
<p>Sub: Submission of Environmental Statement of (Form V) for Sivalarpatti Mines and Melavenkateswarapuram Mines for the year 2015 -2016 – Reg.</p>			
<p>Sir</p>			
<p>Here with we are submitting the Environmental statement for the year 2015 – 2016 in respect of our Sivalarpatti and Melavenkateswarapuram Mines, Vilathikulam Taluk, Thoothukudi District.</p>			
<p>This is for your kind perusal.</p>			
<p>.Thanking you,</p>			
<p>M/s The Ramco Cements Ltd.,</p>			
			
<p>P. Jagadish Babu Sr.DGM (Mines)</p>			
<p>Encl: Environmental Statement (Form V) for Sivalarpatti & M.V.Puram for the year 2015 – 2016.</p>			
<p>CC:</p> <ol style="list-style-type: none">1. The Member Secretary, Tamil Nadu Pollution Control Board, 100, Anna Salai, Chennai.2. The Addl. Principal Chief Conservator of Forests (C) Ministry of Environment & Forests Regional office (Southern Zone) No.34, Cathedral Garden Road, Nungambakkam, Chennai – 600034.			

[FORM – V]

(See rule 14)

Environmental Statement for the financial year ending the 31st March'2016

PART – A

- (i)** Name and address of the owner/
occupier of the industry
operation or process
- THE RAMCO CEMENTS LIMITED
M.V.PURAM LIMESTONE MINES-
GO.NO-168
VILATHIKULAM TALUK
THOOTHUKUDI DISTRICT
- (ii)** Industry category
- Mining of Limestone for Cement Industry
- Primary ----(STC code)
- 1049
- Secondary.----- (SIC Code)
- (iii)** Production capacity,----Units
- 0.101 MTPA
- (iv)** Year of establishment
- 23.03.1988
- (v)** Date of the last environmental
statement submitted
- 25.06.2015

PART – B

Water and River Material Consumption

(1) Water consumption m3/d:

Process	NIL
Cooling	NIL
Domestic	1.0

Name of Products	Process water consumption per unit of product output.	
	During the previous financial Year	During the Current financial Year
	(1)	(2)
(1) Process	NIL	NIL
(2) Cooling	NIL	NIL
(3) Domestic	1.0	1.0

ii) Raw Material Consumption

*Name of raw materials	Name of products	Consumption of raw material per Unit of output	
		during the previous financial year [2014-15]	during the current financial year [2015-16]
Limestone	Limestone	92300.11 TPA	99782.05 TPA

PART – C

Pollution discharged to environment/unit of output
(Parameter as specified in the consent issued)

1) Pollutants	Quantity of pollutants discharged (mass/day)	Concentrations of pollutants in discharges (mass/volume)	Percentage of variation from prescribed standards with reasons
(a) Water	Furnished as ANX-1		
b) Air	Furnished as ANX-1		

PART – D

Hazardous Wastes

(as specified under Hazardous Waste Management and Handling Rules, 1989)

Hazardous Waster	Total Quantity (Kg.)	
	During the previous Financial Year	During the current Financial year
a) From process	Nil	Nil
b) From pollution control facilities	Nil	Nil

**PART – E
Solid Wastes**

	Total Quantity	
	during the previous financial year	during the current financial year
(a) From process	Not Applicable	Not Applicable
(b) From pollution control facility	Not Applicable	Not Applicable
(c) (1) Quantity recycled or re-utilized within the unit		Not Applicable
(2) Sold		
(3) Disposed		

PART – F

Please specify the characterizations (in terms of composition of quantum) of hazardous as well as solid wastes and indicate disposal practice adopted for both these categories of wastes.

Not Applicable

PART – G

Impact of the pollution abatement measures taken on conservation of natural resources and on the cost of production.

We have planted 1000 trees in and around the Mine this year so that we can maintain the Green belt

PART – H

Additional measures/investment proposal for environmental protection including abatement of pollution, prevention of pollution.

Nil

PART – I

Any other particulars for improving the quality of the environment

1. We have laid Bitumen Top roads for quarry roads to avoid fugitive emissions caused by the transportation
2. We have develop adequate Greenbelt all along the boundary.
3. Water Spraying being carried out regularly by water tankers in Mine Haul Roads.
4. Controlled Blasting techniques being practiced in this mine.

ANNEXURE - 1

WATER

Sl.No.	CONCENTRATION OF POLLUTANTS MASS/VOLUME (P.P.M)	NORMS (P.P.M)	% OF VARIATION
1	TOTAL SUSPENDED SOLIDS 5	30.00	83.00% Less
2	pH VALUE 7.39	5.5 - 9.00	-
3	BIO OXYGEN DEMAND D.L-2.0	20.00	90.00% Less

AIR

Sl.No.	QUANTITY OF POLLUTENT	CONCENTRATION OF POLLUTENT	NORMS	% OF VARIATION FROM PRESCRIBED STANDARD
1	PM 2.5	23.81	60	60.32 % less
2	SO ₂	4.57	80	94.29% less
3	CO	BDL(DL-1144)	4000	---
4	NO ₂	8.77	80	89.04% less

CERTIFIED COMPLIANCE FOR THE EC OBTAINED FROM MOEF&CC

Annexure- 9



भारत सरकार
GOVERNMENT OF INDIA
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
MINISTRY OF ENVIRONMENT, FORESTS & CLIMATE
CHANGE
Regional Office (South Eastern Zone),
1st & 2nd floor, HEPC Building, No.34, Cathedral Garden Road,
Nungambakkam, Chennai - 600034



F.No. EP/12.1/173/TN/0590
12.04.2017

To,
The Vice President
M/s. The Ramco Cements Limited "Auras Corporate Centre"
V Floor, 98-A Radhakrishnan Road,
Mylapore,
Chennai – 600 004.

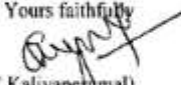
Subject: Expansion of M.V. Puram opencast captive limestone mine (capacity from 1,01,500 tonnes per annum to 4,06,300 tonnes per annum) by M/s. Madras Cements Limited at villages Sivalarpatti, District Thoothukudi, Tamil Nadu-Environmental Clearance-Certified Copy of the Compliance Report-Reg.

Reference: 1) No- J-111015/6/99-IA.II (M) dated 22.11.1999.
2) Your letter dated 09.12.2016

Sir/Madam,

With reference to 2nd cited above, please find enclosed herewith a certified copy of the compliance report. This has been approved by the Addl.PCCF(C) vide diary no.362 dt 14.03.2017.

Yours faithfully


(Dr.C.Kaliyaperumal)
Director (S)

Encl: As above.

Dr. C. KALIYAPERUMAL, M.E., PhD
Director (S)
Government of India
Ministry of Environment, Forests & Climate Change
Regional Office (South Eastern Zone)
HEPC Building, No.34, Cathedral Garden Road,
Nungambakkam, Chennai-600 034.

Certified copy of the compliance report

Sub: Expansion of M.V. Puram opencast captive limestone mine (capacity from 1,01,500 tonnes per annum to 4,06,300 tonnes per annum) by M/s. Madras Cements Limited at villages Sivalarpatti, District Thoothukudi, Tamil Nadu-Environmental Clearance-Reg.

Ref: MoEF Clearance Letter No- J-11015/6/99-IA.II (M) dated 22.11.1999.

Present status of the project

The total area of the Mining Lease is 98.62 ha. Of this the broken up area is 20.35Ha. The depth of the mine is 45 m. There are two OB dumps. The project was visited by this office last year on 13.4.2016. During that visit there were some non-compliance and the Project authorities were directed to rectify those non compliances mainly treating their OB dumps. During this visit it was observed that the work was awarded to M/s. Auroville, Pondicherry and they have started the engineering works i.e. creation of benches and leveling the slopes etc for taking up plantation. The dust suppression during the earlier visit was inadequate and now the dust suppression is adequate and for this the PA have a dedicated water tanker. The mine is under operation.

Date of Monitoring: 10.03.2017

A. Specific Conditions

S.No	Conditions	Compliance
(i)	The OB dumps should be stacked in earmarked dump sites only and should not be kept active for a long period. Inactive OB dumps should be scientifically vegetated with the suitable species to prevent surface run off.	Refer below. The OB is stacked in earmarked dump sites only. There are two dumps. So far about 22,93,140 cu.m of OB has been removed. The PA have awarded the work of dump stabilization to M/S Auroville, Pondicherry recently and they have already started their engineering works such as making different benches, slopes etc. in one dump. For the other OB dump the PA informed that they may start OB dumping and because of this plantation will not be taken up now. The PA have awarded totally six dumps to rehabilitate to M/S Auroville, Pondicherry including this

Page 2 of 7

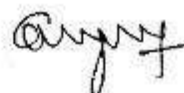


		mine.
(ii)	Top soil should be stacked properly with adequate measures at earmarked site it should be used for reclamation and rehabilitation of mined out areas.	Complied. About 1,74,000 cu.m of top soil has been removed from the inception of the mine and the PA is taking the top soil from here and using for taking up plantation. Further the PA have also agreed to use the top soil for the same purposes.
(iii)	Garland drains of appropriate size should be constructed, to collect surface run-off from the OB & waste dump sites. The collected run-off should be diverted to the sedimentation tank before final disposal.	Garland drains around the periphery of dumps (1200m (L) X 2m (W) X 2m (D)) have already been formed and maintained to arrest the silt and sediments flow from the OB dumps. De-siltation is being done regularly before onset of monsoon every year. The collected run-off is diverted to the sedimentation tank and allowed for percolation.
(iv)	A greenbelt of 30m width around the ML area by planting the native plant species in an area of 10.0ha should be raised in consultation with the local DFO / agriculture department. The density of the trees should be around 2000 plants per ha.	Refer below. The PA have taken up green belt of 30 m width at some places around the M.L area covering about 6.50 Ha. By planting 5125 numbers of native species selected in consultation with State Forest and agriculture department. The plantation works and survival are good. The PA agreed to cover the entire M.L area in a phased manner. In addition to this, about 7.00Ha. just outside of the lease area is also afforested with 6650 Nos. of saplings.
(v)	A detailed mine decommissioning plan should be submitted to the MoEF 5 years in advance for approval.	Agreed to comply. The mine is being operated and has another about 12.0 years life. The PA have agreed to submit a detailed mine decommissioning plan to the MoEF 5 years in advance for approval.
(vi)	Water conservation scheme should include water harvesting and recharging of the ground water.	Complied. All around the mine pit and dumps are provided with Garland drains and finally it is connected into the settling pond. No water is pumped out from this pond and it is allowed only to recharge the ground water. 2 No's of

		siltation pond/recharge pits to the size of (90m(L) x 50m(W) x 3m (D) and 60m(L) x 40m (W) x 3m(D)) are existing. Besides two check dams are also available in the mine. Further the mine pit itself is helping to collect the rain water and it is directly helping to recharge the ground water.
(vii)	Fresh vibration study should be carried out by the project authorities and report submitted to the Ministry within six months time.	Complied. The vibration study was carried out by the Department of Mining Engineering, Anna University, Chennai during July'2000 and report was submitted to the MoEF. Additionally, the PA have engaged Department of Mining Engineering, Anna University, Chennai during December'2012 to assess the blast induced Ground vibration study at this mine.

B. General Conditions

S.No	Conditions	Compliance																								
i	No change in mining technology and working plan should be made without prior approval of the Ministry of Environment & Forests.	Complied. There is no change in the mining technology. The PA have agreed to obtain prior approval from the Ministry in case of any changes..																								
ii	No change in the calendar plan including excavation, quantum of limestone and wastes / overburden dumps should be made.	Complied. The actual quantity mined are within the approved quantity. The details of approved quantity Vs. actually mined is furnished in the below table. <table border="1"> <thead> <tr> <th>Year</th><th colspan="2">Quantity in tonnes</th></tr> <tr> <th></th><th>Approved</th><th>Produced</th></tr> </thead> <tbody> <tr> <td>2012-13</td><td>1,01,500</td><td>52,253</td></tr> <tr> <td>2013-14</td><td>1,01,500</td><td>84,329</td></tr> <tr> <td>2014-15</td><td>1,01,500</td><td>92,300</td></tr> <tr> <td>2015-16</td><td>1,01,500</td><td>99,782</td></tr> <tr> <td>2016-17</td><td>1,01,500</td><td>92,385</td></tr> <tr> <td>up to Feb</td><td></td><td></td></tr> </tbody> </table> Now they are going for an expansion	Year	Quantity in tonnes			Approved	Produced	2012-13	1,01,500	52,253	2013-14	1,01,500	84,329	2014-15	1,01,500	92,300	2015-16	1,01,500	99,782	2016-17	1,01,500	92,385	up to Feb		
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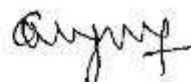


		i.e., 0.72 MTPA (ROM).
iii	Four ambient air quality monitoring stations should be established in the core zone as well as buffer zone for SPM, RPM, SO ₂ , Nox and CO monitoring. Location of the ambient air quality stations should be decided based on the meteorological data, topographical features and environmentally sensitive targets in the consultation with the Tamil Nadu Pollution Control Board.	Complied. Ten number of ambient air quality monitoring stations have been set up in both core and buffer zone based on meteorological data, topographical features and environmentally and ecologically sensitive considerations in consultation with PCB and regular monitoring is carried out through external agency. Monitoring reports shows that the parameters are well within the prescribed limits. The Half yearly monitoring reports are being submitted to the Ministry's RO regularly.
iv	Data on ambient air quality should be regularly submitted to this Ministry including its Regional office and the State Pollution Control Board / Central Pollution Control Board once in six months.	Complied. The PA submitting Ambient Air Quality monitored data regularly to the Regional Office of MoEF, once in six months and State Pollution Control Board once in a month.
v	Fugitive emissions should be controlled, regularly monitored and data recorded properly.	Complied. Road from Mine to the crushing plant which at Pandalgudi is black topped. Water spraying on mine haul roads is being carried out to control fugitive dusts and for that they have deployed a dedicated water tanker. The water tanker is having a capacity of 10 KL and makes 8 to 10 trips in day. Plantation on either side of the road is also developed.
vi	Adequate measures should be taken for control of noise levels below 85 dBA in the work environment	Complied. The PA stated that noise generation due to HEMM is controlled by adopting effective periodical and preventive maintenance system. Acoustic enclosures are provided at the operator cabin in all the equipment. Noise levels are being monitored periodically at 7 locations and as per the reports the noise levels are well within the limits.
vii	Personnel working in dusty areas should wear protective equipment	Complied. Personal protective equipments (PPE)

Page 5 of 7

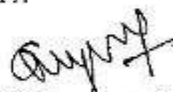


	<p>devices. Adequate training and information on safety and health aspects should be provided.</p> <p>Occupational health surveillance programme of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed</p>	<p>are provided to all employees and they are using. Training on safety and health aspects are given in the group vocational training centre.</p> <p>The occupational health surveillance program is being conducted for the workers as per Mines Act and records are maintained.</p>
viii	<p>Funds earmarked for environmental protection measures should be kept in a separate account and should not be diverted for other purposes and Year-wise expenditure should be reported to the Ministry.</p>	<p>Complied.</p> <p>Annual budget of Rs. 30 lakhs per annum has been allocated for environmental protection measures and being utilized for the said purpose only. The year-wise expenditure being reported to the Ministry along with their six monthly compliance reports.</p>
ix	<p>The project will be monitored by the Regional Office of this Ministry located at Bangalore. The project authorities should extend full cooperation to the officer(s) of the Regional Office by furnishing the requisite data / information / monitoring reports.</p>	<p>Complied.</p> <p>The PA have extended full co operation during the visit and also necessary documents / information were provided.</p>
x	<p>The project authorities should have valid "Consent to operate" and mining plan approval.</p>	<p>Complied.</p> <p><u>Consent to Operate by TNPCB</u> The PA have valid "Consent to operate". The consents are valid up to 31.3.2017. Applied for renewal.</p> <p><u>Mining Plan approval</u> The PA have obtained approval from Indian Bureau of Mines vide their approval No. TN/TKD/MP/LST-1949-MDS dated 18.05.2015 and the approval is valid up to March'2018.</p>
xi	<p>The project proponent should inform the Regional Office located at Bangalore as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of land development work.</p>	<p>Refer below.</p> <p>The PA informed that the company have used only internal capital for this mine. Hence, separate financial closure details are not maintained for this mine.</p>
xii	<p>The above conditions will be enforced,</p>	<p>Being Complied.</p>






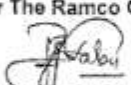
	inter-alia, under the provisions of the water (Prevention and Control of Pollution) Act.1974, The Air (Prevention and Control and Pollution) Act. 1981, the Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and rules.	
xiii	Failure to comply with any of the conditions mentioned above would result in withdrawal of environmental clearance.	Agreed to comply.

This has the approval of the Addl.PCCF(C) vide diary no.362 dt 14.03.2017.


(Dr.C.Kaliyaperumal)
Director(S)

Dr. C. KALIYAPERUMAL, M.E., PhD
Director (S)
Government of India
Ministry of Environment, Forests & Climate Change
Regional Office (South Eastern Zone)
HEPC Building, No.34, Cathedral Garden Road,
Nungambakkam, Chennai-600 034.

**APPLICATION TO PWD FOR GROUND WATER
CLEARANCE**

 <p>THE RAMCO CEMENTS LIMITED (formerly known as Madras Cements Ltd.,)</p>	 <p>ISO 9001 Certified Company</p>  <p>ISO 14001 Certified Company</p>	<p>Ramavarmam Nagar Vendharur (Dist.) Tamil Nadu - 626 204 Phone: 570 84562 256201, 02, 03 & 256241 Fax: 04562-256368 Email: jdmr@ramcocements.co.in</p>
06/04/2015		
<p>To The Chief Engineer PWD, WRO State Ground & Surface Water resources Data Centre Taramani Chennai – 600 113</p>		
<p>Sir, Sub: The Ramco Cements Ltd, Melvenkateswarapuram Limestone Mine in Sennayampatti, Pudur and Nadukattur villages of Vilathikulam Taluk, Thoothukudi District, Tamil Nadu - Abstraction of ground water Permission / NOC requested for mine pit dewatering for 90 m³/day – Regarding.</p>		
<p>Ref: TOR No.J-11015/136/2013-1A.II (M) dated 09.09.2013</p>		
<p>We wish to bring to your kind attention the above cited subject and reference. We are in the process of obtaining Environmental Clearance from Ministry of Environmental and Forest (MOEF) for expansion of Melvenkateswarapuram Limestone Mine. In this regard, we have already obtained TOR from MOEF. In the TOR, a condition is stipulated to obtain Permission / NOC for abstraction of mine pit water from the competent authority.</p>		
<p>In this context, we are herewith submitting "Application for seeking Permission to pump out 90 m³/day ground water", as a part of our mine dewatering along with a detailed hydro-geological report and necessary enclosures.</p>		
<p>Hence, we request your good office to accord permission / NOC for abstraction of ground water from our Melvenkateswarapuram limestone mine.</p>		
<p>Thanking you,</p>		
<p>Yours sincerely,</p>		
<p>For The Ramco Cements Limited.,</p>		
		
<p>P.JAGADISH BABU Sr.DGM (Mines)</p>		
<p>Enclosures: 1. Application format with Hydrogeological report (2 sets) 2. TOR No.J-11015/136/2013-1A.II (M) dated 09.09.2013</p>		



THE RAMCO CEMENTS LIMITED

(formerly known as Madras Cements Ltd.,)

Ramasamy Raja Nagar
Virudhunagar (Dist)
Tamil Nadu – 625 204
Phone: STD 04562
256201, 02, 03 & 256241
Fax: 04562-256268
Email: admin@ramcocements.co.in

MINING ACTIVITY: EXPANSION

APPLICATION FOR PERMISSION TO DEWATER GROUNDWATER FOR MINING

1	General Information	
2	Name of the Mine/Project	The Ramco Cements Limited
3	Location details: (attach site plan, approved mining plan, toposketch of the surroundings 10 Km radius of outside)	Melvenkateswarapuram Limestone Mine
	Village/Town:	Sennayampatti, Pudur and Nadukattur - Villages
	Block/Mandal:	Pudur - Block
	Tehsil/Taluk:	Vilathikulam - Taluk
	District:	Thoothukudi - District
	State:	Tamil Nadu
4	Communication address:	
	i. Complete Postal address	The Ramco Cements Limited, Ramasamy Raja Nagar, Virudhunagar District.
	ii. Phone/Mobile No.	04562-256201,02,03
	iii. E-Mail address	admin@ramcocements.co.in
	iv. Fax No.	04562-256268
5	Salient features of the activity:	Limestone Mining
6	Required groundwater Pumping	90 m ³ /day
7	Land Use details of the project area	
	Total land area (Sq.m)	9,86,200
	Rooftop area of buildings/shed(Sq.m)	2,500
	Green belt area (Sq.m)	97,250
	Open land (Sq.m)	6,81,450
	Mining Area (Sq.m)	2,05,000
8	Topography of the area	
	(a) Regional	Moderately undulating topography
	(b) Project area	Slopping towards NW to SE
9	Drainage in the area(River / nala, etc)	There is no major or minor river flowing in the area
10	Average Annual rainfall in the area:	460 mm
11	Township/ Village within 10 Km radius of the project	Vilathikulam (around 30 km)

2



ISO 9001
Certified Company



ISO 14001
Certified Company

THE RAMCO CEMENTS LIMITED

(formerly known as Madras Cements Ltd..)

Ramasamyraja Nagar
Virudhunagar (Dist)
Tamil Nadu - 626 264
Phone: STD 04562
256203, 02, 03 & 256241
Fax: 04562-256268
Email: adminrm@ramcocements.co.in

12	Comprehensive Hydrogeological report and Quantity of water for mine pit dewatering.	Report is attached, prepared by M/s. Hydro – Soil Engineering Consultants, Chennai. The quantity of water for mine pit dewatering estimation is around 90 Cu.M/day.
13	Attach copy of referral letter seeking NOC from authorized Central/ State Agencies	TOR copy is attached

Undertaking

It is to certify that the date and information furnished above are true to the best of my knowledge and belief and I am aware that if any part of the date/information submitted is found to be false or misleading at any stage the application will be rejected out rightly.

Date: 06.04.2015
Place: Pandalgudi

Name & Signature of the applicant
(with official seal)

Sr.Dy. General Manager(Mines)
The Ramco Cements Limited
Pandalgudi(Po), Aruppukkottai(Tq)
Virudhunagar(Dt)-626 113.

GOVERNMENT OF TAMILNADU
WATER RESOURCES DEPARTMENT
PUBLIC WORKS DEPARTMENT

From	To
Er.B. Rajeswari, B.E., Chief Engineer, PWD. WRD. State Ground and Surface Water Resources Data Centre, Tharamani, Chennai-113.	1. The India Cements Ltd, Ramayanpatti Village, Manur Block, Sankarnagar, Tirunelveli – 627 357 2. Krishna Mines, P.o.No: 8, No: 2 3 Sripuram, Tirunelveli – 627 001. 3. The Ramco Cements Ltd., Manak Udayan, Sendurai, Ariyalur – 621 730. 4. The Ramco Cements Ltd., Ramasamy Raja Nagar, Virudhunagar District.

Lr.No. OT7/AG – IV / F4A / 2015 / dt: 13.05.15

Sir,

Sub: Submission of NOC Application for Ground Water Clearance – Status
reported – Reg.

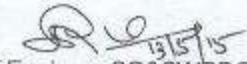
Ref: 1. Your Application a) The India Cements Ltd., dt: 22.01.15 b) Krishna
Mines dt: 07.01.15 c) The Ramco Cements Ltd., Ariyalur, dt:
01.04.15 d) The Ramco Cements Ltd., Virudhunagar, dt: 15.04.15.

2. Chief Engineer's Office Lr.No: OT9/AG3/NOC mining / 2015/dt:;
04.05.15.

Your Application for issue of NOC was received in this office in the
reference 1st cited.

In the reference 2nd cited certain clarification is requested from the
Government towards your application. After receiving the reply, your
application will be processed.

Sd/Er.B.Rajeswari/13.05.15
Chief Engineer, SG&SWRDC,
Chennai – 113.


For Chief Engineer, SG&SWRDC,
Tharamani, Chennai-113.


G.H. WORKS / Tharamani
13/5/15

GOVERNMENT OF TAMILNADU
WATER RESOURCES DEPARTMENT
PUBLIC WORKS DEPARTMENT

From:
Er. S. Thinakaran, B.E., (Hons.), M.E., (Struc.),
Chief Engineer, WRD/PWD,
State Ground & Surface Water
Resources Data Centre
Tharamani, Chennai 600 113.

To:
The Ramco Cements Ltd,
Auras corporate Centre,
5th Floor, 98A, Dr. Radhakrishnan Road,
Mylapore, Chennai-600 004.

Lr.No. OT9/ AG 3 /Mining Project / 2016 Dt :08.12.2016

Sir,

Sub: Mining Project-Ground Water Clearance-NOC- M/s.The Ramco Cements
Ltd- Ariyalur and Virudhunagar District – reg.

Ref: 1. The Ramco Cement Ltd application Lr.No: TRCL-CO/PWD/501
dt: 25.11.2016.
2. This Office Lr.No: OT9/AG3/NOC Mining/2015 dt: 04.05.2015.

With reference to your letter 1st cited, I wish to state the following.

As per the Government Order (G.O. (Ms) No.52 dt: 02.03.2012 & G.O. (Ms)
No.113 dt: 09.06.2016), the chief Engineer, State Ground & Surface Water Resources
Data Centre, Chennai is the competent Authority to issue NOC/Ground water
clearance to the state of Tamil Nadu by imposing conditions and also empowered to
reject or decline any of the requests on technical grounds after scrutiny.

In this regard, in the reference 2nd cited, certain clarification/ technical opinion has
been requested from the Government towards the processing of NOC for dewatering
of Ground Water during Mining. As soon as the reply received from the Government,
necessary action will be taken by this department towards your application.

Sd/- Er. S. Thinakaran/08.12.2016
Chief Engineer (SG&SWRDC)
PWD, Tharamani, Chennai-11

Sd/- Er. S. Thinakaran
For Chief Engineer (SG&SWRDC)
PWD, Tharamani, Chennai-113

08/12/16

COMPLIANCE STATUS FOR CONSENT TO OPERATE ORDER OF TNPCB

**Compliance status of Consent to Operate vide Consent order
No.150811530423 dated 23.09.2015 issued under section 25 of the Water
(Prevention and Control of Pollution) Act, 1974.**

Proceedings No.F.0162TTN/RS/DEE/TNPCB/W/2015 dated 23.09.2015

Sl. No	Condition imposed	Compliance status
1	The unit shall not generate trade effluent at any stage of its manufacturing process under operation.	No trade effluent has generated for our Manufacturing Process.
2	The unit has to develop Green Cover around its boundary as per the Environment Management Plan and EC issued earlier.	Green belt development done in and around mining premises.
3	The unit shall not expand its mining capacity without obtaining valid Environmental Clearance and Consent of TNPCB.	Complied as per Norms.

**Compliance status of Renewal of Consent to Operate vide Consent
order No.150821530423 dated 23.09.2015 issued under section 21 of the
Air (Prevention and Control of Pollution) Act, 1981.
Proceedings No. F.0162TTN/RS/DEE/TNPCB/A/2015 dated 23.09.2015**

Sl. No	Condition imposed	Compliance status
1	The unit shall carryout dust suppression activity efficiently and Continuously so as to achieve the AAQ standards prescribed by the Board.	The dedicated water tankers with sprinklers system to minimize the dust suppression effectively as per the AAQ standards.
2	The unit has to ensure that operation of the unit shall not cause any damage to the surroundings.	The unit will not cause any damage or hindrance to the environment surroundings.
3	The unit shall not expand its mining capacity without obtaining valid Environmental Clearance and consent of TNPCB.	Complied as per Norms.

MICRO- METEOROLOGICAL DATA

Annexure - 12



CREATIVE ENGINEERS & CONSULTANTS

(ISO 9001:2008 CERTIFIED COMPANY)
GOVT. REG. DEPARTMENT OF INDUSTRIES AND COMMERCE - GOIN - 91661
NABL ACCREDITED TESTING LABORATORY

MICRO-METEROLOGICAL DATA								
PROJECT : MELVENKATESWARAPURAM LIMESTONE MINE - EXTENT – 98.62 HA								
NAME OF LOCATION : NEAR PUTHUR VILLAGE					LOCATION CODE : MVM1			
December - 2013								
Date	Temperature in °c		Humidity in (%)		Wind Speed in Kmph		Pre-dominant Wind Direction From	Rainfall (mm)
	MIN	MAX	MIN	MAX	MIN	MAX		
1/12/2013	24.0	34.0	56	79	0.5	6.1	NE	-
2/12/2013	24.0	35.0	43	75	0.7	6.1	NE	-
3/12/2013	22.5	33.0	51	78	0.4	6.2	NE	-
4/12/2013	22.5	33.0	46	78	0.3	11.2	NE	-
5/12/2013	23.5	34.0	44	71	0.5	5.2	NE	-
6/12/2013	22.0	32.0	50	75	0.2	4.1	NE	-
7/12/2013	21.0	34.5	43	74	0.1	4.8	NE	-
8/12/2013	25.0	38.0	40	88	0	3.8	SW	-
9/12/2013	23.5	37.0	45	84	0.3	6.4	SE	-
10/12/2013	23.5	37.5	40	84	0.3	7.2	SE	-
11/12/2013	22.5	38.5	36	83	0.3	4.8	SE	-
12/12/2013	24.0	32.5	39	91	0	6.5	N	-
13/12/2013	23.0	29.0	71	91	0.1	5.6	N	-
14/12/2013	21.5	32.0	55	91	0.1	7.5	NE	-
15/12/2013	22.0	35.5	48	91	0.7	12	NE	-
16/12/2013	21.0	34.0	36	82	0	15	NE	-
17/12/2013	19.5	32.0	42	85	0.3	11.8	NE	-
18/12/2013	20.0	33.5	36	86	1.2	9.6	NE	-
19/12/2013	22.0	34.0	41	79	0.2	14.9	NE	-
20/12/2013	22.0	37.0	40	82	0.3	14.8	NE	-
21/12/2013	22.0	33.5	43	82	0	12.5	NE	-
22/12/2013	20.5	32.0	46	82	0.9	13	NE	-
23/12/2013	20.5	35.5	30	86	0.3	11	NE	-
24/12/2013	21.5	31.0	52	87	0.1	11.1	NE	-
25/12/2013	22.0	30.0	53	78	1.2	9.6	NE	-
26/12/2013	21.0	35.0	43	86	0.5	9.9	NE	-
27/12/2013	19.5	36.0	34	85	0	12.9	NE	-
28/12/2013	20.5	33.0	39	82	0.3	15.6	NW	-
29/12/2013	19.0	33.0	41	88	0.3	7.3	NE	-
30/12/2013	19.5	40.0	28	85	0.4	9.8	NE	-
31/12/2013	20.5	34.5	36	86	0.6	11.2	NE	-
	19	40	28	91	0	15.6	NE	NIL

Prepared by

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(ISO 9001:2008 CERTIFIED COMPANY
GOVT. REG. DEPARTMENT OF INDUSTRIES AND COMMERCE - GOIN - 01861
NABL ACCREDITED TESTING LABORATORY)

MICRO-METEROLOGICAL DATA								
PROJECT : MELVENKATESWARAPURAM LIMESTONE MINE - EXTENT – 98.62 HA								
NAME OF LOCATION : NEAR PUTHUR VILLAGE					LOCATION CODE : MVM1			
JANUARY - 2014								
Date	Temperature in °c		Humidity in (%)		Wind Speed in Kmph		Pre-dominant Wind Direction From	Rainfall (mm)
	MIN	MAX	MIN	MAX	MIN	MAX		
1/1/2014	23.0	33.5	43	75	0	13.7	NE	-
2/1/2014	21.0	34.5	41	91	0.6	9.5	NE	-
3/1/2014	20.5	32.0	44	82	0.6	13	NE	-
4/1/2014	21.5	33.0	48	87	0.6	13.4	NE	-
5/1/2014	21.0	35.0	38	82	0.4	20.4	NE	-
6/1/2014	21.0	35.0	41	78	0.7	11.2	NE	-
7/1/2014	23.0	29.5	55	75	0.8	12.5	NE	-
8/1/2014	20.0	25.0	63	96	1.7	10.4	NE	-
9/1/2014	21.5	30.0	62	91	1.5	11.3	NE	-
10/1/2014	21.0	33.0	51	91	0.8	8.4	NE	-
11/1/2014	21.0	40.0	38	91	0.3	7.8	NE	-
12/1/2014	20.5	38.0	36	95	0.4	5.6	NE	-
13/1/2014	22.0	34.5	46	83	0.9	11.2	NE	-
14/1/2014	23.0	33.0	55	84	0.9	12.1	NE	-
15/1/2014	21.5	35.0	45	83	1.1	9.5	NE	-
16/1/2014	21.5	35.5	38	83	0.4	7.4	NE	-
17/1/2014	22.0	32.5	46	91	0.8	12.9	NE	-
18/1/2014	20.5	35.0	43	91	0.7	9.5	NE	-
19/1/2014	21.0	35.0	46	91	1.3	9.3	NE	-
20/1/2014	21.0	33.5	46	91	0.5	11.8	NE	-
21/1/2014	19.5	34.0	41	91	1.2	9.3	NE	-
22/1/2014	21.0	32.5	42	87	1.9	8.6	NE	-
23/1/2014	21.0	35.0	38	86	1.8	9.7	NE	-
24/1/2014	21.5	34.0	34	91	0.5	15.3	NE	-
25/1/2014	21.0	36.0	38	91	0	9.9	NE	-
26/1/2014	21.0	37.0	36	87	0.8	8.7	NE	-
27/1/2014	21.0	34.0	41	91	1.1	8.7	NE	-
28/1/2014	21.5	38.0	36	82	1.7	9.7	NE	-
29/1/2014	21.0	36.0	32	82	1	11.5	NE	-
30/1/2014	21.0	36.0	34	82	0.3	11.6	NE	-
31/1/2014	20.0	36.5	34	95	0	13.7	NE	-
	19.5	40	32	96	0	20.4	NE	NIL

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(ISO 9001:2008 CERTIFIED COMPANY
GOVT. REG. DEPARTMENT OF INDUSTRIES AND COMMERCE - 80TN - 01661
NABL ACCREDITED TESTING LABORATORY)

MICRO-METEROLOGICAL DATA								
PROJECT : MELVENKATESWARAPURAM LIMESTONE MINE - EXTENT – 98.62 HA								
NAME OF LOCATION : NEAR PUTHUR VILLAGE					LOCATION CODE : MVM1			
FEBRUARY- 2014								
Date	Temperature in °c		Humidity in (%)		Wind Speed in Km/h		Pre-dominant Wind Direction From	Rainfall (mm)
	MIN	MAX	MIN	MAX	MIN	MAX		
1/2/2014	20.5	35.5	38	91	0.9	9.1	NE	-
2/2/2014	21.0	34.5	41	91	2.3	10	NE	-
3/2/2014	21.0	42.0	32	91	0.5	8.7	NE	-
4/2/2014	21.5	39.0	61	96	0.1	7.1	NE	-
5/2/2014	20.0	38.5	45	95	0.1	11.2	NE	-
6/2/2014	21.0	37.5	32	96	0.2	7.2	NE	-
7/2/2014	21.0	36.0	30	86	0.3	19.5	NE	-
8/2/2014	20.5	36.0	34	86	0.2	7.9	NE	-
9/2/2014	21.0	42.0	28	86	0.4	9.2	NE	-
10/2/2014	19.5	36.0	34	95	0.2	8.7	NE	-
11/2/2014	20.5	39.5	28	81	0.2	19	NE	-
12/2/2014	21.0	39.5	28	91	0.2	10.7	NE	-
13/2/2014	22.0	40.0	36	82	0.1	7.7	NE	-
14/2/2014	22.5	39.0	38	78	0.2	11.2	NE	-
15/2/2014	25.5	34.5	46	78	0.2	6.4	NE	-
16/2/2014	24.0	34.0	48	96	0.1	10.8	SE	-
17/2/2014	25.5	35.0	53	81	0.1	7.4	NE	-
18/2/2014	26.0	36.0	50	85	0	4.9	NE	-
19/2/2014	25.0	35.5	53	92	0.6	6.4	NE	-
20/2/2014	24.5	35.5	49	71	0.4	14.8	NE	-
21/2/2014	25.0	36.5	43	84	1.1	8.5	NE	-
22/2/2014	25.5	34.0	51	74	0.2	8.2	NE	-
23/2/2014	24.0	35.5	48	83	0.6	7.3	NE	-
24/2/2014	25.5	36.0	48	77	0.4	7.2	NE	-
25/2/2014	24.5	34.0	48	85	0.1	12.9	NE	-
26/2/2014	23.0	32.5	55	92	2.1	11.3	NE	-
27/2/2014	24.5	35.0	48	88	0.5	8.5	NE	-
28/2/2014	24.0	35.0	45	88	0.9	9.2	NE	-
	19.5	42	28	96	0	19.5	NE	NIL

[Signature]

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AMBIENT AIR QUALITY DATA

Annexure - 13



CREATIVE ENGINEERS & CONSULTANTS

(ISO 9001:2008 CERTIFIED COMPANY
GOVT. REG. DEPARTMENT OF INDUSTRIES AND COMMERCE - GOTH - 01661
NABL ACCREDITED TESTING LABORATORY)

AMBIENT AIR QUALITY

Project : MELVENKATESWARAPURAM LIMESTONE MINE - EXTENT – 98.62 HA

Name of the Location : MINE LEASE AREA MV PURAM


Station Code : MVA1

SL.NO	DATE	PM 10	PM 2.5	SO ₂	NO ₂
1	09.12.13	67.6	26.2	4.1	8.9
2	10.12.13	70.2	29.7	4.5	9.4
3	20.12.13	66.3	25.8	3.8	8.3
4	21.12.13	69.5	27.4	4.3	8.8
5	23.12.13	74.6	28.9	4.8	10.8
6	24.12.13	70.5	27.6	4.1	9.4
7	03.01.14	71.8	28.8	4.5	10.3
8	04.01.14	68.3	26.6	4.9	10.8
9	06.01.14	73.1	28.2	5.4	11.1
10	07.01.14	65.6	26.3	3.7	8.1
11	17.01.14	70.8	27.2	4.3	9.5
12	18.01.14	75.4	30.1	3.6	8.3
13	20.01.14	72.9	28.2	5.1	10.5
14	21.01.14	78.6	31.6	5.7	12.8
15	31.01.14	73.2	29.7	5.4	11.0
16	01.02.14	84.4	33.1	6.2	13.4
17	03.02.14	77.6	30.8	5.6	11.7
18	04.02.14	86.6	34.7	6.0	12.4
19	14.02.14	79.4	31.2	5.4	10.6
20	15.02.14	82.5	32.3	5.9	11.4
21	17.02.14	76.2	29.1	5.6	10.8
22	18.02.14	69.4	26.9	4.9	10.6
23	28.02.14	72.5	28.8	4.3	9.9
24	01.03.14	70.3	27.7	4.6	10.4
	MIN	65.6	25.8	3.6	8.1
	AVG	73.6	29.0	4.9	10.4
	MAX	86.6	34.7	6.2	13.4

Note: BDL – Below Detectable Limit, DL: Detectable Limit.

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[Signature]



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NABL ACCREDITED TESTING LABORATORY

AMBIENT AIR QUALITY

Project : MELVENKATESWARAPURAM LIMESTONE MINE - EXTENT – 98.62 HA
Name of the Location : KAMBATTUPATTI
Station Code : MVA2

SL.NO	DATE	PM10	PM2.5	SO2	NO2
1	09.12.13	52.7	20.6	3.1	7.1
2	10.12.13	56.2	21.5	BDL(D.L-3.0)	6.7
3	20.12.13	60.2	23.7	3.4	7.7
4	21.12.13	55.6	22.1	3.7	9.3
5	23.12.13	54.4	21.6	3.3	8.2
6	24.12.13	51.8	20.4	BDL(D.L-3.0)	6.8
7	03.01.14	58.5	22.7	3.5	8.6
8	04.01.14	62.3	24.6	3.8	9.5
9	06.01.14	57.8	22.1	3.4	8.4
10	07.01.14	54.2	21.6	BDL(D.L-3.0)	7.1
11	17.01.14	59.4	23.4	3.2	8.3
12	18.01.14	55.1	22.5	4.6	10.6
13	20.01.14	50.9	20.0	3.6	9.3
14	21.01.14	56.2	22.3	3.2	7.6
15	31.01.14	53.3	21.4	BDL(D.L-3.0)	7.0
16	01.02.14	57.6	23.1	3.6	8.7
17	03.02.14	66.3	26.0	4.3	10.2
18	04.02.14	63.5	24.7	4.5	10.8
19	14.02.14	59.3	23.5	3.7	9.5
20	15.02.14	65.5	24.2	4.2	9.8
21	17.02.14	68.2	26.4	4.6	10.5
22	18.02.14	63.4	23.5	3.7	9.1
23	28.02.14	57.9	22.7	3.3	7.8
24	01.03.14	61.2	23.3	4.1	9.9
	MIN	50.9	20.0	BDL(D.L-3.0)	6.7
	AVG	58.4	22.8	3.7	8.7
	MAX	68.2	26.4	4.6	10.8

Note: BDL – Below Detectable Limit, DL: Detectable Limit.

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NABL ACCREDITED TESTING LABORATORY)

AMBIENT AIR QUALITY

Project : MELVENKATESWARAPURAM LIMESTONE MINE - EXTENT – 98.62 HA
Name of the Location : MELVENKATESWARAPURAM
Station Code : MVA3

SL.NO	DATE	PM10	PM2.5	SO2	NO2
1	11.12.13	52.2	20.3	3.5	9.8
2	12.12.13	55.7	22.7	3.2	8.1
3	18.12.13	49.5	19.4	BDL(D.L-3.0)	7.2
4	19.12.13	51.4	21.2	3.7	10.1
5	25.12.13	53.8	22.1	3.4	9.1
6	26.12.13	48.7	18.9	BDL(D.L-3.0)	7.5
7	01.01.14	50.4	19.6	3.3	8.0
8	02.01.14	56.6	22.5	3.7	9.2
9	08.01.14	61.8	24.2	4.3	10.6
10	09.01.14	59.3	23.1	3.6	9.5
11	15.01.14	64.2	25.7	4.5	11.0
12	16.01.14	58.8	20.5	3.7	9.6
13	22.01.14	60.6	23.4	4.1	10.1
14	23.01.14	69.2	26.8	3.9	8.7
15	29.01.14	62.5	24.7	4.6	11.4
16	30.01.14	59.7	22.8	3.5	8.2
17	05.02.14	53.6	20.2	BDL(D.L-3.0)	7.5
18	06.02.14	57.4	21.7	3.3	8.3
19	12.02.14	68.2	26.1	3.9	9.5
20	13.02.14	63.4	24.8	3.4	8.8
21	19.02.14	56.3	20.6	BDL(D.L-3.0)	7.5
22	20.02.14	51.8	19.6	BDL(D.L-3.0)	7.3
23	26.02.14	58.5	21.2	3.5	8.9
24	27.02.14	64.7	24	4.0	9.6
	MIN	48.7	18.9	BDL(D.L-3.0)	7.2
	AVG	57.8	22.3	3.7	9.0
	MAX	69.2	26.8	4.6	11.4

Note: BDL – Below Detectable Limit, DL: Detectable Limit.

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NABL ACCREDITED TESTING LABORATORY

AMBIENT AIR QUALITY

Project : MELVENKATESWARAPURAM LIMESTONE MINE - EXTENT – 98.62 HA
Name of the Location : PUDUR
Station Code : MVA4

SL.NO	DATE	PM10	PM2.5	SO2	NO2
1	11.12.13	61.4	24.2	3.7	8.6
2	12.12.13	63.5	27.5	4.1	9.7
3	18.12.13	59.1	23.0	3.4	7.8
4	19.12.13	65.7	28.4	3.8	9.4
5	25.12.13	62.3	27.3	4.5	10.6
6	26.12.13	66.5	28.2	4.9	12.0
7	01.01.14	61.2	24.7	4.1	9.5
8	02.01.14	58.5	23.8	3.7	8.4
9	08.01.14	57.3	22.5	4.6	10.4
10	09.01.14	63.7	28.8	4.1	8.0
11	15.01.14	67.1	29.7	4.8	11.5
12	16.01.14	63.2	27.1	4.3	8.7
13	22.01.14	72.3	30.4	4.6	10.0
14	23.01.14	64.4	27.6	4.8	11.3
15	29.01.14	68.8	30.0	5.2	12.3
16	30.01.14	61.5	25.6	4.5	10.6
17	05.02.14	58.3	24.2	3.8	9.3
18	06.02.14	57.6	23.8	3.2	7.7
19	12.02.14	55.7	22.4	3.5	8.8
20	13.02.14	59.3	24.6	4.1	10.2
21	19.02.14	62.9	26.2	5.0	12.6
22	20.02.14	68.2	28.4	4.3	9.4
23	26.02.14	60.4	25.2	4.6	10.8
24	27.02.14	59.5	24.8	3.9	9.7
	MIN	55.7	22.4	3.2	7.7
	AVG	62.4	26.2	4.2	9.9
	MAX	72.3	30.4	5.2	12.6

Note: BDL – Below Detectable Limit, DL: Detectable Limit.

Prepared by



9B/4, Bharathwajar Street, East Tambaram, Chennai 600 059.

Ph : 22395170, 9444133619, Fax : 91-44-22396643.

e-mail : cecgiri@yahoo.com, web : www.creativeengineers.co.in



CREATIVE ENGINEERS & CONSULTANTS

(ISO 9001:2008 CERTIFIED COMPANY)
GOVT. REG. DEPARTMENT OF INDUSTRIES AND COMMERCE - GOIN - 01661
NABL ACCREDITED TESTING LABORATORY

AMBIENT AIR QUALITY

Project : MELVENKATESWARAPURAM LIMESTONE MINE - EXTENT – 98.62 HA
Name of the Location : SIVALARPATTI
Station Code : MVA5

SL.NO	DATE	PM10	PM2.5	SO2	NO2
1	13.12.13	63.4	24.1	4.2	9.8
2	14.12.13	60.2	23.0	4.7	10.7
3	16.12.13	65.8	25.9	3.8	8.3
4	17.12.13	62.4	23.4	4.1	9.2
5	27.12.13	69.0	27.4	3.6	8.0
6	28.12.13	64.5	25.2	3.3	7.7
7	30.12.13	66.1	26.3	3.9	9.3
8	31.12.13	59.6	23.8	3.7	8.5
9	10.01.14	61.8	24.2	4.4	10.3
10	11.01.14	63.4	25.5	5.2	12.3
11	13.01.14	59.0	23.3	4.6	10.4
12	14.01.14	60.8	24.1	4.0	9.6
13	24.01.14	64.5	25.3	3.7	8.2
14	25.01.14	68.3	27.0	4.5	9.4
15	27.01.14	72.8	28.5	5.6	12.8
16	28.01.14	67.4	26.6	4.9	11.4
17	07.02.14	69.1	28.8	4.3	9.5
18	08.02.14	76.2	31.5	5.5	12.1
19	10.02.14	72.2	30.3	5.1	11.8
20	11.02.14	67.5	28.2	4.7	10.1
21	21.02.14	61.5	25.6	4.3	9.0
22	22.02.14	73.2	31.1	4.9	10.5
23	24.02.14	67.7	28.6	4.5	9.8
24	25.02.14	62.3	26.4	4.1	9.3
	MIN	59	23.0	3.3	7.7
	AVG	65.8	26.4	4.4	9.9
	MAX	76.2	31.5	5.6	12.8

Note: BDL – Below Detectable Limit, DL: Detectable Limit.

Prepared by



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CREATIVE ENGINEERS & CONSULTANTS

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GOVT. REG. DEPARTMENT OF INDUSTRIES AND COMMERCE - G.O.T.N - 01661
NABL ACCREDITED TESTING LABORATORY

AMBIENT AIR QUALITY

Project : MELVENKATESWARAPURAM LIMESTONE MINE - EXTENT – 98.62 HA
Name of the Location : MUTHUPATTI
Station Code : MVA6

SL.NO	DATE	PM10	PM2.5	SO2	NO2
1	13.12.13	48.2	19.3	BDL(D.L-3.0)	6.8
2	14.12.13	51.8	20.2	3.3	7.4
3	16.12.13	47.6	18.9	3.1	7.0
4	17.12.13	53.2	21.2	BDL(D.L-3.0)	6.4
5	27.12.13	46.7	19.2	3.5	8.4
6	28.12.13	50.3	19.7	3.2	7.7
7	30.12.13	45.4	18.3	BDL(D.L-3.0)	7.0
8	31.12.13	49.5	20.2	3.3	8.2
9	10.01.14	56.3	22.6	4.0	9.9
10	11.01.14	53.5	21.9	3.8	9.1
11	13.01.14	59.2	23.6	4.5	10.7
12	14.01.14	51.9	20.7	3.4	8.8
13	24.01.14	49.5	19.4	BDL(D.L-3.0)	6.5
14	25.01.14	47.9	18.8	3.1	7.4
15	27.01.14	56.2	21.6	3.6	8.6
16	28.01.14	60.8	24.5	4.3	10.3
17	07.02.14	58.3	23.7	3.7	9.6
18	08.02.14	49.5	19.6	3.4	7.8
19	10.02.14	57.8	21.3	BDL(D.L-3.0)	7.0
20	11.02.14	61.3	23.8	3.2	7.3
21	21.02.14	59.7	23.0	3.8	9.4
22	22.02.14	53.2	21.8	4.2	10.2
23	24.02.14	47.7	19.6	3.4	9.0
24	25.02.14	55.2	20.5	3.6	9.5
	MIN	45.4	18.3	BDL(D.L-3.0)	6.4
	AVG	52.9	21.0	3.6	8.3
	MAX	61.3	24.5	4.5	10.7

Note: BDL – Below Detectable Limit, DL: Detectable Limit.

Prepared by



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Ph : 22395170, 9444133619, Fax : 91-44-22396643.

e-mail : cecgiri@yahoo.com, web : www.creativeengineers.co.in

REPORT OF MEDICAL EXAMINATION IN “FORM O”

Annexure - 14

THE RAMCO CEMENTS LTD.,
PANDALGUDI MINES.
FORM O

(See Rule 29 F(2) and 29 L)
Report of Medical Examination Under Rule 29 B
(To be issued in Triplicate)


Certificate No. 0928

Certified that Shri/Shrimathi* S. SANKARA NARAYANAN employed as Driver in THE RAMCO CEMENTS LTD. mine, Form B No. 65 has been examined for a Initial / Periodical medical examination. He / She appears to be 30 years of age. The findings of the examining authority are given in the attached sheet. It is considered that Shri / Shrimathi* S. SANKARA NARAYANAN

*(a) Is medically fit for any employment in mines. ☒

*(b) Is suffering from _____ and is medically unfit for
(i) any employment in mine ; or
(ii) any employment below ground ; or
(iii) any employment or work _____

(c) Is suffering from _____ and should get this disability cured / controlled and should be given examined within a period of _____ month*. He / She will appear for re-examination with result of test of _____ ** and the opinion of _____ specialist from _____. He / She* may be permitted / not permitted to carry on his / her* duties during this period.



Size
date

Signature of Examining Authority
Name and Designation in Block Letters

Dr. Major P. VIJAY ANAND, MBBS, AFMC,
Regd. No: 66538
Occupational Health Centre
RCL, Ramasamyraja Nagar-626 204.

Place : Pandalgudi
Date : 01/07/15

* Delete whatever not applicable
** One copy of the certificate shall be handed over to the person concerned and another copy shall be sent to manager of the mine concerned by registered post; and the examining authority shall retain the third copy.

REPORT OF THE EXAMINING AUTHORITY

(To be filled in for every medical examination whether initial or Periodical or re-examination or after cure / control of disability)

Annexure to Certificate No. _____ as result of Medical Examination on _____

Identification of mark: ① Mole near left Eye
② Irregular Scar on (R) Thumb.

Left Thumb Impression of the Candidate

1. General Development : Good / Fair / Poor ✓
2. Height 163 Cms
3. Weight 60 Kgs
4. Eyes : (i) Visual acuity – Distant vision (with or without glasses)
Right eye 6/6 Left eye 6/6 cont glass
(ii) any organic disease of eye / Nil
(iii) *night blindness
(iv) *colour blindness
(v) *squint
(* To be tested in special cases)
5. Ears: (i) Hearing : Right ear Normal Hearing Left ear Normal Hearing.
(ii) Any organic disease Nil
6. Respiratory system : Chest measurement :- (i) after full inspiration 89 cms.
(ii) after full expiration 84 cms.
7. Circulatory system : Blood Pressure 120/80 mm Hg Pulse 76/min
8. Abdomen : Tenderness Nil Liver Not palpable
: Spleen Not palpable Tumour Nil
9. Nervous system : History of fits or epilepsy Nil
Partysis Nil
Mental Health Normal
10. Loco motor system Normal
11. Skin NAD
12. Hernia Nil
13. Hydrocele Nil
14. Any other abnormality Nil
15. Urine : Reaction Acidic Albumin Nil Sugar Nil
16. Skiagram of chest NAD
17. Any other 'c' test considered by examining authority NO
18. Any opinion of specialist necessary NO

Place : Pandalgudi

Date : 01/07/2015

Signature of Examining Authority
D. MADHUKAR, M.B.B.S., AFMC
Regd. No: 66539
Occupational Health Centre
RCL, Ramasamyaraja Nagar-625 263

*Report of Medical Examination as per the recommendations of
National Safety Conferences in Mines
(To be used in continuation with Form O)*

Certificate No. 0928

Name: S. SANKARA NARAYANAN

Identification Marks: ① Mole near Left Eye.
② Irregular Scar on (R) Thumb.

1. Cardiological Assessment

Auscultation	S ₁	
	S ₂	N
Additional Sound		
Electrocardiograph (12 leads) findings:		Normal/ Abnormal

Enclosed ECG ✓

2. Neurological Assessment

Findings	Normal/Abnormal
Superficial Reflexes	Normal
Deep Reflexes	Normal
Peripheral Circulation	Normal
Vibrational Syndromes	Normal

3. ILO Classification of Chest Radiograph:

Profusion of Pneumoconiotic opacities	Grades	Types
Present/Absent		

Enclosed Chest Radiograph ✓

4. Audiometry Findings: *WNL*

Conduction Type	Left Ear	Right Ear
Ear Conduction	Normal/Abnormal	Normal/Abnormal
Bone Conduction	Normal/Abnormal	Normal/Abnormal

Enclosed Audiometry Report. ✓

5. Pathological/Microbiological Investigations:

S.No	Tests	Findings
1.	Blood - Tc, Dc, Hb, ESR, Platelets	WNL/Abnormal
2.	Blood Sugar- Fasting & PP	WNL/Abnormal
3.	Lipid profile	WNL/Abnormal
4.	Blood Urea, Creatinine	WNL/Abnormal
5.	Urine Routine	WNL/Abnormal
6.	Stool Routine	WNL/Abnormal

Enclosed Investigation Reports. ✓

6. Special Tests for Mn exposure

Behavioral Disturbances		Present/ Not Present
Neurological Disturbances	Speech Defect	Present/ Not Present
	Tremor	Present/ Not Present
	Adiadocokinesia	Present/ Not Present
	Emotional Changes	Present/ Not Present

7. Any other Special Test Required: *Nil*

Signature of the Examination Authority

[Signature]
Dr. Major R. VIJAY ANAD, M.B.B.S. AFM
Regd. No: 66538
Occupational Health Centre
RCL, Ramasamyraja Nagar-636 254

Report of Medical Examination under Mines Rule 29B
(To be used in continuation with Form O)


Certificate No. 0928.
Name: S. SANHARA NARAYANAN.
Identification Marks: ① Mole near (R) Eye.
② Irregular Scar on (R) Thumb.

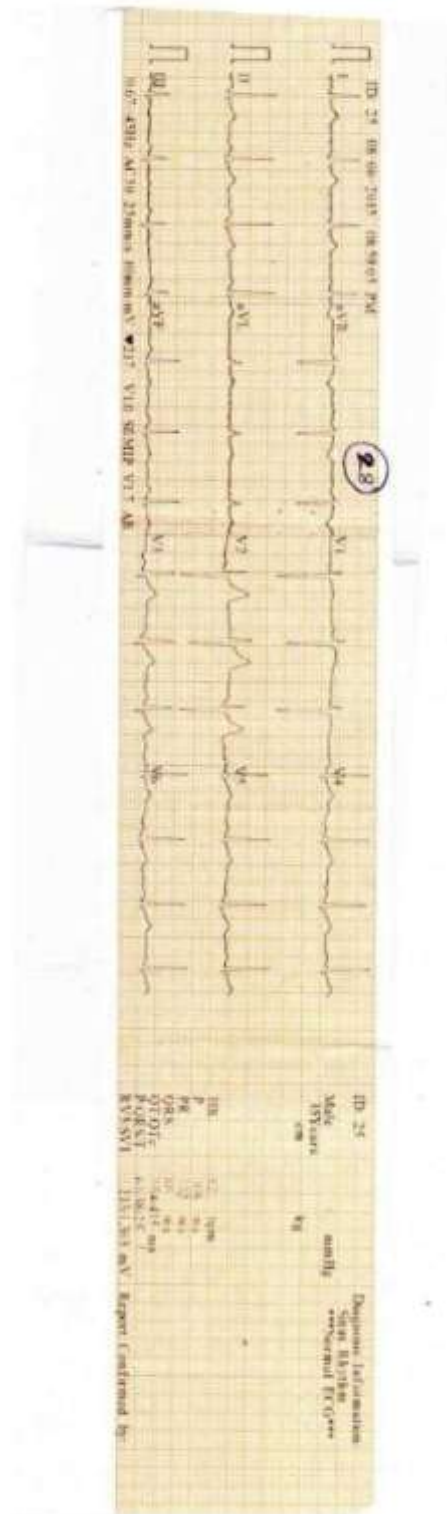
Result of Lung Function Test (Spirometry)

Parameters	Predicted Value	Performed Value	% of Predicted
Forced Vital Capacity (FEV)	3.81	3.22	85
Forced Vital Capacity 1 FEV1	3.26	2.86	87
FEV1/FVC	82.2	88.5	108
Peak Expiratory Flow	9.02	7.37	82

Spirometry Report enclosed ✓

Signature of the Examination Authority

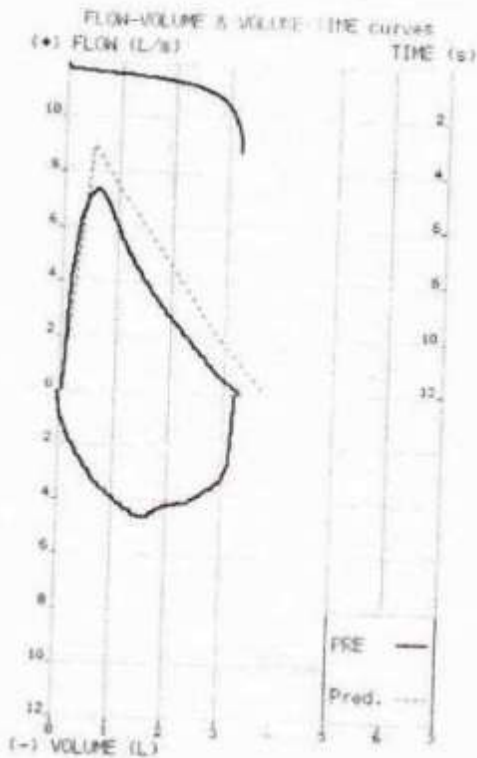

Dr. Major R. V. ANAD, M.B.B.S. (P) 1963
Regd. No: 66538
Occupational Health Centre
RCL, Ramasamyraja Nagar-626 264



Progress Notes	
Name : <u>Sankaranarayanan</u>	Age : <u>30</u> Gender : <u>M/P</u>
M.R.No : <u>1509</u>	Date: <u>9/6/15</u>
<p>Alpax 29m 30mm</p> <p>BR ++50 +1.50</p> <p>Scs</p> <p>BR 616m</p> <p>BR 204m</p> <p>Co/ounn. normal</p>	
<p>அரவிந்த் கண் மருத்துவமனை அருள்முகம் கண் பரிசோதனை மையம் Door No: 176/1, அழகப்பேட்டை சேது அரசு மேல்நிலைப்பள்ளி அருகில் சென்னை - 600 013, கேள்வி: 04566-261166</p> <p>ARAVIND EYE HOSPITALS - FREE SECTION</p>	

Dr. Bharathibabu, Plumb ...

TEST DATE: 08/06/15, 08/06/15, 10/06/15, 11/06/15, 12/06/15
NAME: Sankaranarayanan S
BIRTH DATE: 23/07/1961, 01/11/1960, 02/02/62
AGE: 28 HEIGHT: cm 164 WEIGHT: kg 64 SEX: M
PRE File N° 405 PREDICTED ERS




PARAMETER	Predicted	PRE #1	SPred.
FVC	L	3.81	3.22
FEV1	L	3.28	2.85
FEV1/FVC	%	82.2	88.5
FEV6	L	3.81	3.22
PEF	L/s	9.82	7.07

SPIROMETRY INTERPRETATION:
Normal Spirometry

QUALITY CONTROL GRADE: D

REPEATABILITY: None

Made by spirolab III Ver. 1.1 SN 080205

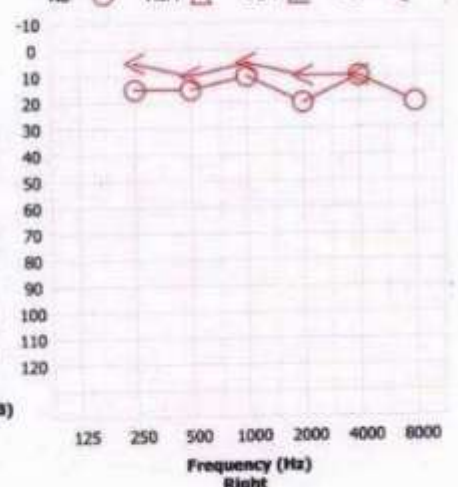


CRESCENT HOSPITALS

37/1, Sivagangai Road, (Opp. to Avain Milk Project),
K.K. Nagar, MADURAI - 625 020.
Ph. : 0452 - 2585803, 2585804 Fax No. : 0452 - 4393803

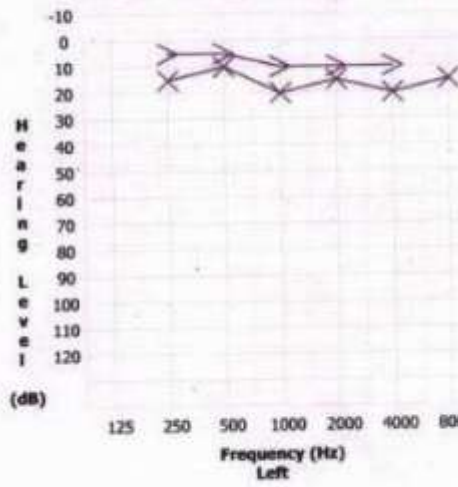
Name: Mr.S.Sangaranarayanan		Address: Address1: 28	
Phone No.	Age: 30 Sex: Male	Address2: R.R.Nagar	
Mobile No.	Email:	Address3:	

AC ○ ACM △ BOM □ BC <



Frequency (Hz)
Right

AC × ACM □ BOM □ BC >



Frequency (Hz)
Left

Doctor/Audiologist: DR SYED BASHUTHEEN		Address:
Phone No.:		

Date: 09-06-15	Case#:	Audiometer: Graphix DIGI-15
----------------	--------	-----------------------------

Remarks: *Heavy with in nasal cavity*

Filename: _____

Dr. M. SYED BASHUTHEEN, M.S.D.
 SENIOR ENT SPECIALIST
 CRESCENT E.N.T. HOSPITAL &
 RESEARCH CENTRE
 37/1, SIVAGANGAI ROAD
 OPP. TO AVAIN MILK PROJECT
 K.K. NAGAR, MADURAI - 625 020



AR Diagnostics

(Franchisee of DiaGno Labs NABL Certified)
F29, Bishop Aruldas Complex (upstair)
Near Arul Muthu Residency, Arasaradi,
Madurai - 625 016, TAMILNADU, INDIA
Phone : 0452 - 4353685 Mobile : 9025597299, 98421 73885, 98421 73614
email : apot1714@gmail.com, ardiagnostic2012@gmail.com

PATIENT NAME : MR.S.Sankaranarayanan (1506/0928) (C) **AGE :** 30 Years **SEX :** Male
LAB REF NO : 0928 **ACCESSION NO :** 1506/0928
COLLECTED ON : 09/06/2015 **REGISTERED ON :** 09/06/2015 **REPORTED ON :** 09/06/2015
Report Status: Final **REFERRED BY :** MADRAS CEMENTS Ltd.,

TEST	RESULT	UNITS	BIOLOGICAL Ref RANGE
------	--------	-------	----------------------

HAEMATOLOGY

BLOOD GROUPING * O*

Rh TYPING POSITIVE

BIO CHEMISTRY

BLOOD GLUCOSE (RANDOM) 91 mg/dl 80 - 120

BLOOD UREA 23 mg/dl 15 - 40

SERUM CREATININE 0.72 mg/dl 0.4 - 1.4

TOTAL CHOLESTEROL 210 mg/dl 150 - 250

LIVER ENZYMES

TOTAL BILIRUBIN 0.8 mg/dl 0.5 - 1.0

DIRECT BILIRUBIN 0.5 mg/dl 0.0 - 0.6

INDIRECT BILIRUBIN 0.3 mg/dl 0.0 - 0.4

End Of Report



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Chief of Lab Services

Minutes of Public Hearing

DHINAMANI – 21.01.2016

தமிழ்நாடு மாசு கட்டுப்பாடு வாரியம்

பொது அறிவிப்பு

14.09.2006 அன்று திருத்தப்பட்ட 1994-ம் ஆண்டு சுற்றுச்சூழல் தாக்க மதிப்பீடு அறிவிக்கையின்படி, பொது மக்கள் கேட்புறையானது சொல்லப்பட்ட அறிவிக்கையின் 1-ஆம் அட்டவணைப்பில் உள்ளடக்கப்பட்ட தொழிற்சாலைகள் அமைத்திறதும் அவசியமானதாக செய்ப்பட்டுள்ளபடியால்.

மேற்படி அறிவிக்கையின் 4-ஆம் அட்டவணைப்பின் (1) மற்றும் (2) பகுதிகளின் (1), (1) ஆகிய துணைப்பகுதிகளின்படி, பொதுமக்கள் கேட்புறையானது, மாநில மாசு கட்டுப்பாடு வாரியத்தால் நடத்தப்படுதல் வேண்டும் என்கிறபடியால்.

14.09.2006 அன்று திருத்தப்பட்ட 1994-ஆம் ஆண்டு சுற்றுச்சூழல் தாக்க மதிப்பீடு அறிவிக்கையின் 4-ஆம் அட்டவணைப்பின் (2)-ஆம் பகுதியின் (1) ஆம் துணைப்பகுதியின்படி வேண்டுகோள்கள்படி, பின்வரும் தொழில் திட்டங்களுக்காக உருத்து கேட்டுணையும் கூடும். கீழே குறிப்பிட்ட தேதியன்றும், நேரத்திலும், இடத்திலும், தமிழ்நாடு மாசு கட்டுப்பாடு வாரியத்தால் நடத்தப்பட உத்தேசிக்கப்பட்டுள்ளது.

தொழிற்சாலை அமைவிடம்	தேதி	நேரம்	நடக்கவிடுக்கும் இடம்
திரு. தி. ராமசேகர் சிவசென்டர் மின்விடம், தமிழ்நாடு, தூத்துக்குடி மாவட்டம், வினாத்திசைம் வட்டத்தில், புதூர், சென்னையம்பட்டி மற்றும் நடுகாட்டுர் கிராமங்களில் உள்ள கண்ணாம்புகல் குவாரியிலிருந்து எடுக்கப்படும் கண்ணாம்புகல் (ROM) வறுத்திற்து 0.101 மில்லியன் டன்சென்றிருந்து 0.50 மில்லியன் டன்சென்றாக அதிகரித்தல்.	25.02.2016	மாலை 03.15 மணி	T.R. சுப்பராவ் கல்யாண மண்டபம், பரமசி ரோடு, புதூர்-628 905, வினாத்திசைம் தாலுகா, தூத்துக்குடி மாவட்டம்

இதன் தொடர்பாக மேற்படி திட்டத்தின் செயலாணைபை கருக்க செயல் விளக்கம் பின்வரும் இடங்களில் கிடைக்கக்கூடியவாறு வகை செய்யப்படுகிறது என்று இதன் மூலம் தெரிவிக்கப்படுகிறது.

1. அரசு செயலர், சுற்றுச் சூழல் மற்றும் வனத்துறை, புலித் தாங்க கோட்டை, தலைமை செயலகம், சென்னை-600 009.
2. மாவட்ட ஆட்சித் தலைவர் அலுவலகம், தூத்துக்குடி மாவட்டம், பாண்டையர்கோட்டை, ரோடு, கோரம்பள்ளம், தூத்துக்குடி
3. மாவட்ட தொழில் ஸெய்ம், தூத்துக்குடி மாவட்டம், ஸபலா ரோடு சந்திப்பு, தூத்துக்குடி
4. வட்டார வளர்ச்சி அலுவலர், புதூர் மஞ்சளாறு சூரியன், புதூர், வினாத்திசைம் வட்டம், தூத்துக்குடி மாவட்டம்.
5. உறுப்பினர் செயலர், தமிழ்நாடு மாசு கட்டுப்பாடு வாரியம், 76, மவுண்ட் சாலை, சென்னை-600 032.
6. மாவட்ட சுற்றுச்சூழல் மற்றும் பொறியாளர் அலுவலகம், தமிழ்நாடு மாசு கட்டுப்பாடு வாரியம், 77 மற்றும் 79, சிப்காட் தொழிற்சாலை வளாகம், பின்னிடிகள், தூத்துக்குடி-8.
7. மண்டல அலுவலகம், சுற்றுச்சூழல் வனத்துறை மற்றும் காவலகம் மாற்ற அமைச்சகம், தொன்மிகு மண்டலம், முதல் மற்றும் கிரண்டாவது தளம், கைத்தறி ஏற்றுமதி கைத்தறிபு ஸை கட்டிடம், 34, கத்திரை களிடன், நுங்கம்பாக்கம், சென்னை-600 034.

தமிழ்நாடு மாசு கட்டுப்பாடு வாரியத்தின் தூத்துக்குடி மாவட்ட சுற்றுச்சூழல் சூழல் பொறியாளரால், இந்த அறிவிப்பு வெளியிடப்பட்ட தேதியிலிருந்து 30 நாட்களுக்குள் இது தொடர்பாக பொதுமக்களின் கருத்துக்கள், மதிப்புரைகள், மற்றும்புரைகள் வரவேற்கப்படுகின்றன.

ஆகவே அமைந்தள்ள இடம் / இத்திட்டத்தால் இயல்புசெய்ய வேண்டிய செயல்கள் மற்றும் இத்திட்டத்தால் வரும்பாணம் பாதிக்கப்படுகிற இடங்களில் வாழும் உண்மையான குடிமக்கள், சுற்றுச்சூழல் குழுக்கள் மற்றும் பிரேர் உள்ளடங்கலாக அனைவரும் பொதுமக்கள் கருத்து கேட்டுணையும் கூடத்தில் பங்கேற்று மேற்கண்ட தொழிற்சாலைக்கெனப் புற்றி அவசியமான கருத்துக்களை வாய்மையானவோ / எழுத்து வடிவிலோ, தமிழ்நாடு மாசு கட்டுப்பாடு வாரியத்தின் தூத்துக்குடி மாவட்ட சுற்றுச்சூழல் சூழல் பொறியாளரிடம் அளக்கலாம்.

உறுப்பினர் செயலர்,
தமிழ்நாடு மாசு கட்டுப்பாடு வாரியம்,
76, மவுண்ட் சாலை, சென்னை-600 032.

செ.ம.தொ.தி.105/வரு.செ.2016

INDIAN EXPRESS – 21.01.2016

TAMILNADU POLLUTION CONTROL BOARD

PUBLIC NOTICE

Whereas as per Environmental Impact Assessment Notification, 1994, as amended on 14.09.2006, Public Hearing has been made as mandatory for all the projects covered in Schedule -1 of the said Notification.

Whereas Public Hearing has to be conducted by State Pollution Control Board as per Sub Para (i),(ii) of paras (1) and (2) of Schedule - IV of Environmental Impact Assessment Notification, 1994 as amended on 14.09.2006.

Whereas as required under Sub-Para (1) of Para (2) of Schedule - IV of Environmental Impact Assessment Notification, 1994, as amended on 14.09.2006, public hearing is to be conducted by Tamil Nadu Pollution Control Board for the following project:

Location of the Project	Date	Time	Place
M/s. THE RAMCO CEMENTS LIMITED. To increase the Limestone mining from 0.101 Million TPA to 0.50 Million TPA (ROM) in the mines located in Pudur, Sennaiyampatti and Nadukattur Villages, Vilathikulam Taluk, Thoothukudi District of Tamilnadu.	25.02.2016	03.15 p.m	T.R.Subbaraj Kalyana Mahal Paralachi Road, Pudur - 628905 Vilathikulam Taluk Thoothukudi District

In this connection, it is informed that executive summary of the project is made available in the following places.

1. Secretary to Government, Environment & Forest Department, St. George Fort, Secretariat, Chennai - 600 009.
2. Office of the District Collector, Thoothukudi District, Palayamkottai Road, Korampallam, Thoothukudi.
3. District Industries Centre, By-pass road junction, Thoothukudi - 628 101.
4. Block Development Officer, Pudur Panchayat Union, Pudur, Vilathikulam Taluk, Thoothukudi District.
5. The Member Secretary, Tamil Nadu Pollution Control Board, No.76, Mount Salai, Guindy, Chennai - 600 032.
6. Office of the District Environmental Engineer, Tamil Nadu Pollution Control Board, C7 & C9, SIPCOT Industrial Complex, Meelavittan, Thoothukudj -628 008.
7. Regional Office, Ministry of Environment, Forest and Climate Change, South Eastern Zone, 1st and 2nd Floor, Handloom Export Promotion Council Building, 34 Cathedral garden, Nungambakkam, Chennai-600 034.

Suggestions, views, comments and objection from the public are invited within 30 days from the date of publication of this notice by the District Environmental Engineer, Tamil Nadu Pollution Control Board, Thoothukudi.

All persons including bonafide resident, Environmental groups and others located in the mines site / sites of displacement / sites likely to be affected can participate in the public hearing and they can also make Oral / Written suggestions to the District Environmental Engineer, Tamil Nadu Pollution Control Board, Thoothukudi on the above subject.

**Member Secretary,
Tamilnadu Pollution Control Board,
76, Mount Salai,
Guindy, Chennai - 600 032.**

DIPR/108/DISPLAY/2016



தமிழ்நாடு மாசு கட்டுப்பாடு வாரியம்

திருத்தம்

தூத்துக்குடி மாவட்டம், விளாத்திக்குளம் வட்டம், புதூர், சென்னையம்பட்டி, நடுக்காட்டுர் கிராமங்களில் உள்ள தி/ள் தீ ராங்கோ சிமெண்ட்ஸ் லிமிடெட், நிறுவனத்தாரின் சுண்ணாம்புக்கல் குவாரியிலிருந்து சுண்ணாம்புக்கல் எடுக்கும் அளவின் அதிகரிப்பிற்காக ஒரு பொதுமக்கள் கருத்து கேட்டுணரும் கூட்டம் தொடர்பாக பொது அறிவிப்பு 21.01.2016 அன்று நாளிதழில் வெளியிடப்பட்டது. அதில் குறிப்பிடப்பட்டுள்ள தொழிற்சாலைத் தின் விவரம் இதன் மூலம் கீழ்க்கண்டவாறு திருத்தம் செய்யப்படுகிறது.

“தி/ள் தீ ராங்கோ சிமெண்ட்ஸ் லிமிடெட், தமிழ்நாடு, தூத்துக்குடி மாவட்டம், விளாத்திக்குளம் வட்டம், புதூர், சென்னையம்பட்டி, நடுக்காட்டுர் கிராமங்களில் உள்ள சுண்ணாம்புக்கல் குவாரியிலிருந்து (98.62 hectare) எடுக்கப்படும் சுண்ணாம்புக்கல் வருடத்திற்கு 0.101 மில்லியன் டன்களிலிருந்து 0.50 மில்லியன் டன்களாக (0.72 மில்லியன் டன் (ROM) அதிகரித்தல்”

பொதுமக்கள் கருத்து கேட்புரைக் கூட்ட நாள், நேரம் மற்றும் நடக்கவிருக்கும் இடம் ஆகியவற்றில் மாற்றம் இல்லை.

உறுப்பினர் செயலர்,
தமிழ்நாடு மாசு கட்டுப்பாடு வாரியம்,
76, மவுண்ட் சாலை, கிண்டி,
சென்னை -32

செ.ம.தொ.இ/119/வரைகலை/2016



TAMILNADU POLLUTION CONTROL BOARD

Chennai - 32.

CORRIGENDUM

A Public Notice about the Public Hearing to be conducted on 25.02.2016 at 3.15 P.M at T.R. Subbaraj Kalyana Mahal, Paralachi Road, Pudur - 628 905, Villathikulam Taluk, Thoothukudi District, regarding the proposed enhanced production activity of the mines located at Pudur, Sennaiyampatti and Nadukattur Villages of M/s. The Ramco Cements Limited, was issued on 21.01.2016. In the Notice, the details of the proposed project is hereby altered to read as:

“M/s. THE RAMCO CEMENTS LIMITED, To increase the Limestone mining from 0.101 Million TPA to 0.50 Million TPA (0.72 Million TPA (ROM) in the mines located in Pudur, Sennaiyampatti and Nadukattur Villages (98.62 hectares), Vilathikulam Taluk, Thoothukudi District of Tamilnadu”.

There is no change in the date, time & venue of the Public Hearing.

**Member Secretary,
Tamilnadu Pollution Control Board
76, Mount Salai, Guindy,
Chennai-600 032.**

DIPR/119/Display/2016

தூத்துக்குடி மாவட்டம், வினாத்திருளம் தாலுகா புதூர் கிராமத்தில், 25.02.2016
அன்று மாலை 3.15 மணியளவில் நடைபெற்ற பொதுமக்கள் கருத்துக்கேள்புணர்வு
கூட்டத்தின் நடவடிக்கைக் குறிப்புகள்

திட்டம் :

இடம் :

தி இராம்கோ சிமெண்ட்ஸ் லிமிடெட்
மேல்வெங்கடேஸ்வரபுரம்
கண்ணம்புக்கல் சுரங்க உற்பத்தி
திறன் விரிவாக்கம் 0.101 மில்லியன்
டன்னிலிருந்து 0.50 மில்லியன் டன்
வரை ஆண்டு ஒன்றுக்கு (0.72மில்லியன்
டன் ஆண்டு ஒன்றுக்கு - ROM) புதூர்,
சென்னியம்பட்டி மற்றும் நடுக்காட்டுர்
கிராமங்கள், வினாத்திருளம் வட்டம்,
தூத்துக்குடி மாவட்டம்.

டி. ஆர். சுப்பராஜ் கல்யாண மகால்
பரளச்சி ரோடு
புதூர் – 628905
வினாத்திருளம் வட்டம்
தூத்துக்குடி மாவட்டம்.

முன்னிலை :

1. திரு. ம. ரவிநகுமார் இ.ஆ.ப. மாவட்ட ஆட்சியர், தூத்துக்குடி மாவட்டம் -
தலைவர்.
2. திரு. ஆர். சேலாதன், M.E., மாவட்ட சுற்றுச்சூழல் பொறியாளர், துடிநாடு
மாகக்கட்டுப்பாட்டு வாரியம், தூத்துக்குடி மாவட்டம் - நிகழ்ச்சி ஒருங்கிணைப்பாளர்.

பங்கேற்பாளர்கள் :

1. திரு. எம்.சீனிவாசன், தலைவர் (உற்பத்தி) தி ராம்கோ சிமெண்ட் லிமிடெட்,
சென்னை.
2. திரு. என். இரவீந்தர், முத்த உபதலைவர் (உற்பத்தி) தி ராம்கோ சிமெண்ட்
லிமிடெட், ஆர்.ஆர்.நகர், விருதுநகர் மாவட்டம்.
3. திரு. விலாஸ் தெவி, முத்த உபதலைவர் (சுரங்கம்), தி ராம்கோ சிமெண்ட்
லிமிடெட், சென்னை.
4. திரு. பி.ஜெகதீஸ்வரபு, முத்த துணை பொது மேலாளர் (சுரங்கம்) தி ராம்கோ
சிமெண்ட் லிமிடெட், பந்தல்குடி.
5. திரு. ஸௌகந்திரம் சுப்பிரமணியன், உதவி பொது மேலாளர் (நிலத்தியல்) தி
ராம்கோ சிமெண்ட் லிமிடெட், பந்தல்குடி.
6. திரு. சி.விஜயகுமார், துணை மேலாளர் (நிலத்தியல்) தி ராம்கோ சிமெண்ட்
லிமிடெட், பந்தல்குடி.
7. திரு. பி.கோதண்டபாணி, துணை மேலாளர் (சுற்றுச்சூழல்) தி ராம்கோ
சிமெண்ட் லிமிடெட், சென்னை.
8. திரு. தேவராஜா, உதவி பொது மேலாளர், தி ராம்கோ சிமெண்ட் லிமிடெட்,
பந்தல்குடி.
9. திரு. சீரி, கிரியேட்டிவ் என்ஜினியர், சென்னை.

2

பொதுமக்கள்

சுற்றுப்புற கிராம பொது மக்கள் 228 பேர்கள்.

தமிழ்நாடு மாகாண கட்டுப்பாடு வாரிய தூத்துக்குடி மாவட்ட சுற்றுச் சூழல் பொறியாளர் அவர்கள் பொதுமக்களின் கருத்துக்கேட்பு கூட்டத்தில் கலந்து கொள்ளவுள்ள பொதுமக்களை வரவேற்றார், இக்கூட்டத்தின் தலைவர் மற்றும் மற்றும் மாவட்ட ஆட்சியர் அவர்களையும் வரவேற்று பேசினார். மாவட்ட சுற்றுச்சூழல் பொறியாளர், சுற்றுச்சூழல் (பாதுகாப்பு) சட்டம் 1986-ன் கீழ் வெளியிடப்பட்ட சுற்றுச்சூழல் ஒப்புகின்ற தாக்கல் அறிவிக்கை SO.1533, நாள்: 14.09.2006 பற்றி விளக்கினார். மேற்கண்ட அறிவிக்கையில் சுரங்க விரிவாக்கத்திட்டம் உள்ளதாகவும், அதுகுறித்து மாவட்ட ஆட்சியர் முன்னிலையில் பொது மக்களின் கருத்துக்களைக் கேட்க, கருத்துக் கேட்புறை கூட்டம் நடத்தப்பட வேண்டுமென்றும் கூறினார்.

மாவட்ட ஆட்சியர் அவர்கள், சுரங்க விரிவாக்கத்திட்டம் பற்றிய பொதுமக்கள் கருத்துக் கேட்புறவு கூட்டம் பற்றிய விளம்பரங்கள் ஒரு மாதத்திற்கு முன்பு தமிழ் மற்றும் ஆங்கில பத்திரிகையில் விளம்பரப் படுத்தப்பட்டதை கூறினார். இதுபோன்ற திட்டங்களை செயல்படுத்தும் பொழுது சுற்றியுள்ள பகுதிகளில் சுற்றுப்புறச்சூழல் தரம் அதாவது, நீரின் தரம், காற்றின் தரம், மக்கள்தொகை மற்றும் தொழில், விவசாயம் குறித்த விவரங்களை அறிந்தும் மற்றும் எதிர்காலத்தில் ஒப்புகின்ற விளைவுகள் குறித்தும் சுற்றுப்புறச்சூழல் தாக்க கணிப்பு அறிக்கையில் பதிவு செய்துள்ளார்கள் என்பதையும் கூறினார். தூத்துக்குடி மாவட்டமானது நெடுஞ்சாலை, இரயில்வே, துறைமுகம் மற்றும் விமான போக்குவரத்து வசதிகளால் இணைக்கப்பட்டுள்ளதால் தொழில் வளர்ச்சி ஏற்படவும் வாய்ப்புள்ளது எனவே, நிறைய முதலீட்டாளர்கள் தூத்துக்குடி மாவட்டத்தில் முதலீடு செய்யவும் முன் வருகிறார்கள்.

பொதுமக்கள் திட்டம் குறித்து தங்களது கருத்துக்களை இக்கூட்டத்தில் நேரடியாக பேசலாம் அல்லது மனுவாகவும் தங்களது கருத்துகளைத் தெரிவிக்கலாம். பொதுமக்களின் கருத்துகள் அனைத்தும் பதிவு செய்யப்பட்டு அரசுக்கு அனுப்பி வைக்கப்படும் என்பதை மாவட்ட ஆட்சியர் தெரிப்படுத்தினார்.

மாவட்ட சுற்றுச்சூழல் பொறியாளர், தி ராம்கோ சிமென்ட்ஸ் நிறுவனத்தின் அனுமதிக்களை, தற்போதய சுரங்கத்தின் விரிவாக்கத் திட்டம் குறித்த விளக்கங்களை விளக்கிக்கூறுமாறு அழைத்தார்.

தி ராம்கோ சிமென்ட்ஸ் உதவி பொது மேலாளர், பந்தல்குடி, திரு.தெய்வராஜா அவர்கள் தமிழ்நாட்டில் இயங்கும் ராம்கோ நிறுவனத்தின் சிமென்ட் ஆலைகள் பற்றிய விவரங்கள் குறித்தும் இந்த புதுர் கிராம கண்ணாம்புக்கல் சுரங்க விரிவாக்கத்திட்டம் குறித்த தேவைகள் பற்றியும் அறிமுகப்படுத்தினார். பீன்பு நிறுவனத்தின் சார்பாக ஆலோசகரான சென்னை கிரியேட்டிவ் என்ஜினியர் திரு. கிரி அவர்களை விரிவாக்கம் செய்யப்போகும் திட்டம் குறித்தும், சுற்றுப்புறக்கிராமங்களில் நடத்தப்பட்ட சுற்றுச்சூழல் தாக்க விவரங்களை விவரிக்குமாறு கேட்டுக்கொண்டார்.

சென்னை கிரீயேட்டிவ் என்ஜினியரான திரு.கிரி அவர்கள் திட்டம் நடைபெறவுள்ள இடத்தை சுற்றி 10 கி.மீ சுற்றளவில் சுற்றுப்புறச்சூழல் தாக்கம் குறித்த விபரங்களை பதிவு செய்துள்ளதாக தெரிவித்தார். மேலும் சின்னத்திரையில் சுரங்க திட்ட வரையும் மற்றும் தற்பொழுது நடைபெறுகக்கொண்டு இருக்கின்ற சுரங்க செயல்முறைகள் குறித்தும் உத்தேசிக்கப்பட்ட சுரங்க செயல்முறைகள் குறித்தும், வரைபடங்கள் மற்றும் செயற்கைக்கோள் படங்கள் மூலமாக விரிவாக விளக்கினார். மேலும் வனவிலங்கு செயல்பாடுகள், வனம் மற்றும் ஊரில் பாதிப்படைபக்கடிய பகுதிகள் எதுவும் இப்பகுதியில் இல்லை என்பதை கூறினார். மேலும் நீரின் தரம், காற்றின் தரம், தாவர வகைகள், விவசாய செயல்பாடுகள், சமூக மேம்பாட்டு ஆய்வு ஆகியவை குறித்த தற்சமய சுற்றுச்சூழல் தன்மைகள் மற்றும் நிலைமைகள் குறித்து விளக்கினார்.

புதூர், சென்னையிலிருந்து மற்றும் நடுக்காட்டுச் கிராமங்களில் அமைந்துள்ள சுரங்கத்தின் கண்ணாம்புகல் உற்பத்தித்திறன் விரிவாக்கமானது 0.10 மில்லியன் டன்ஸிலிருந்து 0.50 மில்லியன் டன்கள் வரை ஆண்டு ஒன்றுக்கு (0.72 மில்லியன் டன் ஆண்டு ஒன்றுக்கு - ROM) அதிகரிக்க உத்தேசிக்கப்பட்டுள்ளது பற்றி விரிவாக எடுத்துரைத்தார். திட்ட விரிவாக்கம் செய்யும்பொழுது ஏற்படுகின்ற சுற்றுச்சூழல் விளைவுகள் கணிக்கப்பட்டு, அதனால் ஏற்படுகின்ற விளைவுகளை கட்டுப்படுத்த தேவையான மாசுக்கட்டுப்பாட்டு முறைகளான தூசுகளை மெல்லும்பாதாவாறு தண்ணீர் தெளித்து கட்டுப்படுத்தும் முறை, மேல்மண் போடப்படும் இடங்கள் மற்றும் சுரங்கம் இல்லாத பகுதிகளிலும் மரம், செடிகளை நட்டு அதை பராமரித்து வளர்த்தல் போன்ற முறைகளை கையாள்வதன் மூலம் மாசு கட்டுப்படுத்தப்படும் என்பதை விளக்கினார். மேலும் பாதுகாப்பான வழிமுறைகளில் அநாவசிய நவீன தொழில்நுட்ப முறையில் வெடி வைத்தல், மற்றும் நவீன போக்குவரத்து வசதிகள் போன்ற முறைகள் தற்சமயம் நடைமுறைப்படுத்தப்படும் என்றார். இது குறித்து, வெடிவைக்கும் ஒரு மாற்றி செயல்முறையானது கிராம மக்கள் மற்றும் பஞ்சாயத்துத் தலைவர்கள் முன்னிலையில் வெடித்தாக்கப்பட்டிருக்கிறது. அதன் விளைவாக ஏற்படுகின்ற அதிர்வலைகளின் அளவுகளானது நிர்ணயிக்கப்பட்ட 10 வரையறைக்குள் இருந்ததை விளக்கினார். சுற்றுப்புற கிராமங்களில் நடைபெற்ற சமூக நலத்திட்டங்களின் செயல்பாடுகள் குறித்தும் விளக்கினார். இறுதியாக, வருடத்திற்கு ரூபாய் 20 இலட்சம் அளவில் சுற்றுப்புற கிராமங்களுக்கு சமூகநலத்திட்டத்தின்கீழ் தனியாக செலவளிக்கப்படும் என்றும் கூறினார்.

பின்னர், மாவட்ட சுற்றுச்சூழல் பொறியாளர், உத்தேசிக்கப்பட்ட திட்டத்தைப் பற்றி பொதுமக்கள் தங்கள் கருத்துகளை தெரிவிக்குமாறு கேட்டுக்கொண்டார்.

1. திரு. ஜெயவேலு (முன்னால் உராட்சி மன்றத்தலைவர், புதூர்)

தி ராமகே சிமெண்ட்ஸ் நிறுவனத்தினர் சுற்றுப்புற கிராமங்களில் மருத்துவ மருகங்கள், சாலை வசதி மற்றும் 20க்கும் மேற்பட்ட அடிப்படை அமைத்து குடிதண்ணீர் வசதி போன்ற தேவைகளை பூர்த்திசெய்துள்ளார்கள். ராமகே நிறுவனத்தாரின் சுரங்க செயல்பாட்டினால் பொதுமக்கள் மற்றும் விவசாயிகளுக்கு எவ்வித பாதிப்பும் இல்லை. இருத்தபொழுதும் நிறுவனத்தார் கால்நடைகளுக்கு குடிநீர் பருகுவதற்கு தடுப்பணைகள் கட்ட வேண்டுமென்றும், இப்பகுதியின் இளைஞர்களுக்கு வேலைவாய்ப்பு வழங்கவேண்டுமென்று கேட்டுக்கொள்கிறேன்.

④

2. திரு. கனகராஜ் (மேலவெங்கடேஸ்வரபுரம்)

தி ராம்கோ சிமென்ட்ஸ் நிறுவனத்தின் பல் அடிப்படை வசதிகளை எங்கள் கிராமத்திற்கு செய்துள்ளனர். நாங்கள் இத்தத்திட்டத்தை வரவேற்கிறோம்.

3. திரு. கட்டராஜ் (கீழ் அருணாச்சலபுரம்)

தி ராம்கோ சிமென்ட்ஸ் நிறுவனத்தின் பல்வேறு நலத்திட்டப்பணிகளை எங்கள் கிராமங்களுக்கு செய்துள்ளார்கள்.

4. திரு. பெருமாள்சாமி (மணியக்காரன்பட்டி)

தி ராம்கோ சிமென்ட்ஸ் நிறுவனத்தின் சுற்றுப்புள்ள கிராமப்பகுதிகளுக்கு 24 மணிநேர தண்ணீர் விநியோகம், சாலை வசதி, மருத்துவமுகாமங்கள் மற்றும், ஆழ்க்னறு அடிப்புகள் போன்ற உதவிகளை செய்துள்ளனர். எதிர்காலத்திலும் இதுபோன்ற நலப்பணிகள் தொடரும் என நம்புகிறோம்.

5. திரு. எஸ்.இராமன் (நெடுங்கரைபட்டி, பந்தல்குடி)

தி ராம்கோ சிமென்ட்ஸ் நிறுவனத்தின் எங்கள் கிராமப்பகுதிகளில் பல்வேறு நலத்திட்டங்கள் மற்றும் மருத்துவ முகாமங்கள் நடத்தியுள்ளனர். ஏதிர்காலத்திலும் இதுபோன்ற நலப்பணிகள் தொடரவேண்டும் என்று வேண்டுகோள் விடுக்கிறேன்.

6. திரு. சுந்தரவேல் (கம்பத்துப்பட்டி)

எங்கள் கிராமத்தில் 2015ம் ஆண்டில் சில மாதங்களில் கிராமங்களுக்கான தண்ணீர் தேவையானது பற்றாக்குறையாக இருந்தது. இது தொடர்பாக தி ராம்கோ நிறுவனத்தாருக்கு வேண்டுகோள் விடுத்த உடனே நிர்வாகம் தலையிட்டு எங்களுக்கு தேவையான தண்ணீர் வசதி செய்து உதவினார்கள். இதுபோல பல நலத்திட்டப்பணிகளையும் நிர்வாகம் எங்களுக்கு செய்து கொடுக்கிறார்கள்.

7. திருமதி. சங்கரேஸ்வரி (தலைமை ஆசிரியை, உடஒதுதினலப்பள்ளி, கீழ் அருணாச்சலபுரம்)

தி ராம்கோ சிமென்ட்ஸ் நிறுவனத்தார் எங்கள் பள்ளிக்கூடத்திற்கு சைக்கிள் எட்டாண்ட் கட்டி, கிராவல் கொடுத்து நாழ்வான பகுதியை மேம்படுத்தியது போன்ற பல உதவிகளை செய்துள்ளனர். மேலும் நிர்வாகம் எங்கள் பள்ளிக்கு காம்பவுண்ட் சுவர் கட்டத்தருமாறு வேண்டுகிறோம்.

8. திரு. பீர்த்தபதி (கம்பத்துப்பட்டி)

ராம்கோ நிறுவனத்தின் சுற்றுப்புற கிராமங்களுக்கு தேவையான உதவிகளை செய்துகொடுத்துள்ளனர். பந்தல்குடியில் 5-ம் வகுப்புவரை இயங்கிவரும் ராம்கோ வீதியாலயா பள்ளியை 8-ஆம் வகுப்பு வரை தரம் உயர்த்தினால் எங்கள் குழந்தைகள் உயர்கல்வி பயில் வசதியாக இருக்கும். மேலும் எங்கள் கிராமத்திற்கு ஒரு தண்ணீர் தொடடி அமைத்து தந்தால் அது எங்கள் கிராமத்தின் குடிநீர் தேவையை பூர்த்தி செய்யும்.

9. திரு. இராஜேந்திரன் (சென்னியம்பட்டி பஞ்சாயத்துத் தலைவர்)

ராம்கோ நிறுவனத்தார் எங்கள் கிராமத்திற்கு பல்வேறு நலத்திட்ட உதவிகளை செய்துள்ளனர். இறுப்பினும் சுரங்கத்திற்கு அருகாமையில் அமைந்துள்ள கிராமங்களில் வெடிவைக்கும்பொழுது அதிர்வுகள் ஏற்படுவதாக புகார்கள் தெரிவித்துள்ளனர். ஆகையால் நினாகம் வெடிவைக்கும் முறைகளில் அதிர்வின் தொழில்நுட்பத்தை பயன்படுத்துமாறு கேட்டுக்கொள்கிறோம். இது தவிர நிறுவனத்தினர் எங்கள் கிராம பகுதிகளுக்கு .பொர்வெல், மரக்கன்றுகள் மற்றும் இளைஞர்களுக்கு வேலைவாய்ப்பு வசதிகள் செய்துகொடுத்துள்ளனர்.

10. திரு. மனோகரன் (கம்பந்லுபட்டி)

ராம்கோ நிறுவனமானது எங்கள் கிராமத்திற்குத் தேவையான உதவிகளை கேட்கும் போதெல்லாம் செய்து கொடுத்துள்ளனர். மக்களின் வேண்டுகோளுக்கிணங்க அவர்கள் சில பகுதிகளில் வேலி அமைத்துள்ளனர்.

11. திரு. பால்சாமி செட்டியா (பந்தல்குடி)

கடந்த 18 வருடங்களுக்கு முன்பாக நாங்கள் எங்கள் நிலத்தை ராம்கோ நிறுவனத்திற்கு கொடுத்தோம். இராம்கோ நிறுவனமானது எங்கள் கோவில் நிலங்களுக்கு பல லோடுகிராவல் உதவி மற்றும் தண்ணீர் வினியோக வசதி போன்ற உதவிகளை எங்களுக்கு செய்துகொடுத்துள்ளார்கள்.

12. திரு. சீனிவாசன் (தெடுக்கரைப்பட்டி, பந்தல்குடி)

ராம்கோ நிறுவனமானது எங்கள் கிராம பொதுமக்களுக்கு கல்வி வசதி, கூடார வசதி போன்ற பல உதவிகளை செய்துகொடுத்துள்ளனர். அண்மையில் ஒரு குழந்தையின் இருதய அறுவைச்சிகிச்சைக்கு உதவி செய்துள்ளனர்.

13. திரு. லிங்கையா (புதூர்)

எங்கள் கிராமப்பகுதியில் உள்ள பள்ளிக்குழந்தைகளுக்கு வெளியூர் சென்று உயர்கல்வி படிப்பதற்கு போதுமான பஸ் வசதி இல்லை. புதூர் பகுதியில் எந்தவிதமான தேசிய வங்கியும் இல்லை. புதூர் பகுதியில் உயர்கல்வி வசதிகளை மேம்படுத்தவேண்டும்.

14. திரு. எஸ்.இராமகிருஷ்ணன் (முன்னாள் புதூர் பேரூராட்சித்தலைவர்)

ராம்கோ நிறுவனமானது பல்வேறு நலத்திட்ட உதவிகளை சுற்றுப்புற கிராமப்பகுதிகளுக்கு செய்துகொண்டிருக்கிறார்கள். இந்தப்பகுதியில் பெண்கள் கல்லூரி இல்லை. ஆகையால் பெண்கள் நாத்துக்குடி அல்லது வீரகுநன் செல்ல வேண்டியுள்ளது. எனவே ஒரு பெண்கள் கல்லூரியை புதூர் அல்லது பந்தல்குடி பகுதிகளில் அமைத்தால் உதவியாக இருக்கும். இத்திவாகம் அதிர்வுகள் உருவாகாதபடி வெடிவைக்குமாறு சுரங்கப்பணியை மேற்கொள்ளவேண்டும்.

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15. திரு. பெரியபூசு (புதுர் டவுன் பஞ்சாயத்துத் தலைவர்)

ராம்கோ நிறுவனத்தால் சுற்றுப்புற கிராம மக்களுக்கு வேலைவாய்ப்பு கிடைத்துள்ளது. மேலும் இத்தப்பகுதியில் மாணவர்களின் நலன்கருதி உயர்கல்வி பள்ளி அமைக்க வேண்டும்.

16. திரு. அண்ணக்கொடி (கீழ் அருணாச்சலபுரம்)

ராம்கோ நிறுவனமானது எங்கள் கிராமப்பகுதிகளுக்கு தேவையான பல்வேறு உதவிகளான கல்வி, சுகாதாரம் மற்றும் பிற நலத்திட்ட உதவிகளை நன்றாக செய்து கொடுத்துக் கொண்டிருக்கிறார்கள். சுரங்கப்பணிகள் முடிவடைந்த ஆழமான சுரங்கப்பகுதியினை கிராவல் நிரப்பி மூடவேண்டும். சுரங்கப்பணிகளால் விவசாய நிலங்கள் பாதிப்படையக்கூடாது. இந்நிலங்களில் உள்ள மூட்செடிகள் அகற்றப்படவேண்டும். வெயில் காலங்களில் உருவாகும் தண்ணீர் பற்றாக்குறையை நீக்குவதற்கு நிர்வாகம் தடையல்லாத தண்ணீர் விலியோகத்தை கிராமப்பகுதிகளுக்கு செலுத்தக்கொடுக்க வேண்டும். கிவிலி டிபன்மோ படித்த இளைஞர்களுக்கு வேலைவாய்ப்பு வழங்கிட வேண்டும். கடந்த நூற்பது வருடங்களாக ராம்கோ நிறுவனமானது விவசாயிகளுக்கு எவ்வித இடையூறும் இல்லாமலும் மற்றும் பல்வேறு நலத்திட்ட உதவிகளை சுற்றியுள்ள கிராமப்பகுதிகளுக்கு செய்து வருகிறார்கள்.

இத்துடன் பொதுமக்கள் தங்கள் கருத்துக்களை தெரிவித்து முடித்தனர். பின்னர் பொதுமக்களில் பலர் தங்கள் கருத்துக்கள் மற்றும் கோரிக்கைகளை எழுத்துப்பூர்வமாக மாவட்ட ஆட்சியரிடம் கொடுத்தனர்.

நிறைவாக சுற்றுச்சூழல் பொறியாளர், மாவட்ட ஆட்சியர் அவர்களுக்கும் கூட்டத்தில் ஒத்துழைப்பு நல்கிய கிராமபொது மக்கள் அனைவருக்கும் நன்றியை தெரிவித்துக்கொண்டார்.

அத்துடன் கூட்டம் நிறைவுபெற்றது.

இணைப்புகள் : கருத்துக்கேட்பு கூட்டத்தில்

கலந்து கொண்ட

கிராமத்தினரின் மனுவர்கள் - 30

மாவட்ட சுற்றுச்சூழல் பொறியாளர்
தமிழ்நாடு மாசுக்கட்டுப்பாட்டு வாரியம்
தூத்துக்குடி.

மாவட்ட ஆட்சியர்
தூத்துக்குடி

Minutes of the Public Hearing Meeting conducted on 25.02.2016 at 3.15 P.M at Pudur,
Vilathikulam Taluk, Thoothukudi District Tamil Nadu.

Project:

M/s.The Ramco Cements Limited,
Melvenkateswarapuram
Limestone Mine – Expansion Project
0.101 Million TPA to 0.50 Million
TPA (0.72 Million TPA – ROM), Pudur
Sennayampatti and Nadukattur Villages
Vilathikulam Taluk, Thoothukudi District

Venue:

T.R. Subbaraj Kalyanamahal,
Paralachi Road,
Pudur – 628 905
Vilathikulam Taluk
Thoothukudi District

Present:

1. Thiru. M. Ravikumar I.A.S., District Collector, Thoothukudi - Chairman
2. Thiru R. Seralathan M.E. District Environmental Engineer,
TNPC Board, Thoothukudi - Convenor

Participants:

1. Thiru. M. Srinivasan, President - Mfg – M/s. The Ramco Cements Ltd, Chennai
2. Thiru. N. Ravishankar, Sr. Vice President – Mfg – M/s. The Ramco Cements Ltd,
R.R. Nagar, Virudhunagar District
3. Thiru. Vilas Teggi, Sr. Vice President (Mines) – M/s. The Ramco Cements Ltd,
Chennai
4. Thiru. P. Jagadish Babu, Sr. DGM – Mines - M/s. The Ramco Cements Ltd,
Pandalgudi
5. Thiru. Venkatrama Subramanian – AGM (Geology) – M/s. The Ramco Cements Ltd,
Pandalgudi
6. Thiru. C. Vijayakumar, Dept. Manager (Hydrogeology) – M/s. The Ramco Cements Ltd,
Pandalgudi
7. Thiru. P. Kothandapani, Dept. Manager (Environment) – M/s. The Ramco Cements Ltd,
Chennai
8. Thiru. Thevaraja, AGM - M/s. The Ramco Cements Ltd, Pandalgudi
9. Thiru. Giri, Creative Engineer, Chennai.

Public People

Public People of surrounding villages (228 Nos)

The District Environmental Engineer, Tamil Nadu Pollution Control Board, Thoothukudi welcomed the Public who have to come to participate in the Public Hearing Meeting. He also, welcomed the District Collector, Thoothukudi District, who is the Chairman of the meeting. The District Environmental Engineer has explained about the EIA Notification SO.1533 dated 14.09.2006 issued under the Environment (Protection) Act 1986. He further informed that the mining expansion projects are covered under the above Notification and the Public hearing is to be conducted in the presence of the District Collector to hear the opinions of the Public.

The District Collector has informed that the Notice of the Public Hearing for this project have been Published in English & Tamil news papers one month before the date of Public Hearing. He has informed that when implementing these type of projects the Environmental quality surrounding the project site such as ground water quality, Air quality, Population in the surrounding villages and their occupations, Agriculture are studied in the field and the possible future impacts are assessed and recorded in the form of an EIA Report. Thoothukudi District has all facilities such as Highways, Railways, Airport and Harbour facilitating the District with the possibility of Industrial developments. Hence, many investors are coming forward to invest in Thoothukudi District.

The District Collector has informed that the Public can express their opinions about this project in this meeting and may also give written opinions, which will be recorded and sent to the Government.

The District Environmental Engineer then invited the personnels of M/s. The Ramco Cements Ltd., to explain about the proposed expansion project of their existing mines.

Thiru. Thevaraja of M/s. The Ramco Cements Ltd, Pandalgudi, gave an introduction of their Cement factories which are functioning in the State and explained the need for their expansion activity of the Lime Stone Mines, located in Pudur Village. Then he requested his consultant to explain about the proposal of the expansion Project and the studies conducted to assess the impact on the Environment in the surrounding Villages.

The Consultant Thiru.Giri, Creative Engineers, Chennai, has informed that, the EIA studies have been conducted in an area of 10 Km radius surrounding the project site. He then explained through Power Point, about the plan of mines, its present and proposed mining activities, with relevant drawings and satellite pictures. He informed that there are no Wild Life Sanctuaries, Forest or any sensitive areas in this study area. He explained about the present Environmental Status regarding the water quality, Air quality, vegetation, Agricultural Activity, Socio Economic Studies etc.,

He then explained about the proposed expansion activity of the lime stone mines in Pudur, Sennayampatti & Nadukattur Villages to increase the lime stone production from 0.10 Million TPA to 0.50 Million TPA.(0.72 Million TPA- ROM). He informed that the Environmental impacts due to this expansion activity has been assessed and will be mitigated with necessary Pollution Control Measures such as dust suppression using water sprinkling methods, planting and maintaining trees in the spoil bank area and in other non active areas of the mines. He also explained about the safety measures which will be adapted during the mining activity, modern blasting techniques and limestone transportation activities. He informed that a test blasting activity was conducted in the surrounding Villages in the presence of the Village Presidents and the Public to assess the vibration levels, and in all the cases the Peak Particle Velocity (PPV) is well within the norms of 10 mm/sec. He explained about the CSR activities carried out in Surrounding Villages.

He finally concluded that M/s. The Ramco Cements Ltd., Management will allot Rs. 20/- Lakhs per Annum exclusively for the CRS activities, in and around the villages.

Then, the District Environmental Engineer invited the Public to express their opinion about this proposed project.

1. Thiru. Jeyavelu – Ex – President, Pudur Village

The management of M/s. Ramco Cements Ltd., has carried out health camps, laid roads in the surrounding Villages and dug more than 20 Nos of bore wells for the drinking needs of the people. Due to the mining activities of M/s. Ramco Cements Ltd., there were no harms to the Public or to the farmers. However, the management has to propose check dams to provide water for the cattle and shall give employment to the educated youth.

2. Thiru. Kanagaraj – Melvenkateswarapuram

The Management of M/s. Ramco Cements Ltd., has done many facilities to the Villages. We welcome the project.

3. Thiru. Subburaj – Keela Arunachalapuram

M/s. Ramco Cements Ltd., has carried out many welfare measures to the Village people.

4. Thiru. Perumalsamy – Manikaranpatti

M/s. Ramco Cements Ltd., management has done 24 hrs water supply to the nearby villages, made road facilities, conducted health camps and installed bore well with hand pumps. We hope such welfare activity will continue in future.

5. Thiru.S. Ramar – Nedunkarapatti, Pandalgudi

M/s. Ramco Cements Ltd., has conducted welfare schemes, health camps etc., We request to continue the welfare measures in our villages.

6. Thiru. Sundaravel – Kampathupatti

There was a shortage of water for the village people for a few months in the year 2015, and we requested the M/s. Ramco Cements Ltd., management to help us and they have immediately supplied us with sufficient water. The management is doing many such welfare measures.

7. Tmt. Sankareswari – Headmistress (Middle School) – Keela Arunachalapuram

M/s. Ramco Cements Ltd., has done many helps to the school, they have filled our land with gravel & provided a cycle stand for our School. We further request the management to construct the compound wall to our school.

8. Thiru. P. Theerthapathy – Kampathupatti

M/s. Ramco Cements Ltd., done all the helps necessary for the surrounding Villages, we request that the existing Ramco Vidyalaya School at Pandalgudi is to be upgraded from V std to VIII std, so that our children can study higher classes in the Ramco School itself. A water tank may be constructed in our village to cater the needs of drinking water.

9. Thiru. Rajendran – Sennavampatti Panchayat President:

The Ramco management carries out many welfare measures to our village. However, in the villages near the existing mines, complaints are received about the vibration caused during blasting operations in the mines. Hence, the management has to do the blasting activities by using modern blasting techniques. Also, they should provide bore wells, plant trees and give employment for the youth.

10. Thiru. Manoharan – Kampathupatti

M/s. Ramco Cements Ltd., management is doing helps to the village when ever requested. They have provided fencing in some places requested by people.

11. Thiru. Paulsamy Chettiar – Pandalgudi

We have given our land to M/s. Ramco Cements Ltd., 18 years ago, the management has filled our temple land with several loads of gravel & provided water supply to us.

12. Thiru. Srinivasagam – Nadunkarainatti, Pandalgudi

M/s. Ramco Cements Ltd., management is providing all facilities to the village people in terms of education, health etc. Recently the management has helped for the surgical operation of a child in our village.

13. Thiru. Lingaiah – Pudur:

There is no national bank in Pudur the Bus facilities are not enough for the school children to go out for higher classes. Hence, the education facility in the village is to be upgraded.

14. Thiru. S.Ramakrishnan – Ex- Chairman, Pudur Panchayat Union

M/s. Ramco Cements Ltd., management is doing all the welfare measures to the villages in the surrounding area. There are no ladies College in these areas and hence, ladies have to go to Thoothukudi or Viruthanagar for College Education. Hence, a ladies College shall be formed in Pudur, or Panthalkudi areas. The management shall carryout blasting in the mines without causing Vibrations in the vicinity.

15. Thiru. Periyabasu – President – Pudur – Town Panchayat

Due to the M/s. Ramco Cements Ltd., management, the surrounding people get income by way of employments. We request that a high school shall be formed to facilitate the local children to study.

16. Thiru. Annakodi – Keela Arunachalapuram

M/s. Ramco Cements Ltd., Management, is doing all welfare measures to our villages regarding education, health and other aspects. The mines are very deep and hence, the Management should fill the mining completed pits with gravel soil. The mining activity shall not affect the Agriculture Lands. The thorny bushes in the area shall be removed. During summer the water scarcity is more and hence, the management shall give uninterrupted water supply to the villages. The management shall give employment to the youth who have completed Diploma in Civil Engineering. During the past 40 years, the Ramco Management not interfered with the farmers and have implemented many welfare measures in the surrounding villages.

With that, the expressions of opinions by the public were completed. The Public then gave their written opinions/ requisition to the District Collector.

Finally, the District Environmental Engineer has thanked the District Collector and also thanked the Public for their Co-operation during this meeting.

With that the meeting came to an end.

Enclosure: The representations given by the villagers
during the meeting - 30 Nos


District Environmental Engineer,
Tamil Nadu Pollution Control Board,
Thoothukudi.


District Collector
Thoothukudi.

57

1) திரு. சேகரன் சுவாமிநாதன்	
2) திரு. சிதம்பரம் சிவசுப்பிரமணியன்	NA பதிலளித்தார்
3) V. சத்யா	NA பதிலளித்தார்
4) M. அனந்தசுந்தரன்	NA பதிலளித்தார்
5) M. நரசிம்மன்	NA பதிலளித்தார்
6) K. கௌசல்யா	NA பதிலளித்தார்
7) E. மகேசுவரன்	NA பதிலளித்தார்
8) A. அனந்தசுந்தரன்	NA பதிலளித்தார்
9) A. அனந்தசுந்தரன்	NA பதிலளித்தார்
10) G. சிவசுப்பிரமணியன்	NA பதிலளித்தார்
11) S. தாமசு	NA பதிலளித்தார்
12) H. தாமசு	NA பதிலளித்தார்
13) K. கௌசல்யா	NA பதிலளித்தார்
14) J. அனந்தசுந்தரன்	NA பதிலளித்தார்
15) E. அனந்தசுந்தரன்	NA பதிலளித்தார்
16) S. அனந்தசுந்தரன்	NA பதிலளித்தார்
17) G. சிவசுப்பிரமணியன்	NA பதிலளித்தார்
18) S. அனந்தசுந்தரன்	NA பதிலளித்தார்
19) S. அனந்தசுந்தரன்	NA பதிலளித்தார்
20) V. சத்யா	NA பதிலளித்தார்
21) த. அனந்தசுந்தரன்	NA பதிலளித்தார்
22) K. P. அனந்தசுந்தரன்	NA பதிலளித்தார்
23) R. அனந்தசுந்தரன்	NA பதிலளித்தார்
24) P. அனந்தசுந்தரன்	NA பதிலளித்தார்

52.

ക്രമം	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം
25	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം
26	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം
27	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം
28	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം
29	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം
30	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം
31	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം
32	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം
33	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം
34	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം
35	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം
36	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം
37	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം
38	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം
39	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം
40	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം
41	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം
42	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം
43	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം
44	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം	മുഖ്യ സർവ്വേ ഭാഗം

69

45.	S. Mahalingam, District Engineer	S. Mahalingam
46.	G. Mahalingam, "	G. Mahalingam
47.	P. Mahalingam, "	P. Mahalingam
48.	S. Mahalingam, District Engineer	S. Mahalingam
49.	G. Mahalingam, "	G. Mahalingam
50.	P. Mahalingam, "	P. Mahalingam
51.	G. Mahalingam, District Engineer	G. Mahalingam
52.	P. Mahalingam, District Engineer	P. Mahalingam
53.	M. Mahalingam, District Engineer	M. Mahalingam
54.	G. Mahalingam, District Engineer	G. Mahalingam
55.	P. Mahalingam, District Engineer	P. Mahalingam
56.	G. Mahalingam, District Engineer	G. Mahalingam
57.	P. Mahalingam, District Engineer	P. Mahalingam
58.	G. Mahalingam, District Engineer	G. Mahalingam
59.	P. Mahalingam, District Engineer	P. Mahalingam
60.	G. Mahalingam, District Engineer	G. Mahalingam
61.	P. Mahalingam, District Engineer	P. Mahalingam
62.	G. Mahalingam, District Engineer	G. Mahalingam

61

63.	செய்து, பீதேமெய்யாறு	பி.கே.சி.
64.	செய்து, II.	செ.கே.சி.
65.	செய்து, II	செ.கே.சி.
66.	S.கே.சி. செ.கே.சி. செ.கே.சி.	செ.கே.சி.
67.	செ.கே.சி. செ.கே.சி.	செ.கே.சி.
68.	பி.கே.சி. செ.கே.சி.	செ.கே.சி.
69.	செ.கே.சி. செ.கே.சி.	செ.கே.சி.
70.	செ.கே.சி. செ.கே.சி.	செ.கே.சி.
71.	செ.கே.சி. செ.கே.சி.	செ.கே.சி.
72.	செ.கே.சி. செ.கே.சி.	செ.கே.சி.
73.	செ.கே.சி. செ.கே.சி.	செ.கே.சி.
74.	செ.கே.சி. செ.கே.சி.	செ.கே.சி.
75.	M. செ.கே.சி. செ.கே.சி.	M. செ.கே.சி.
76.	P. செ.கே.சி. செ.கே.சி.	P. செ.கே.சி.
77.	S.S. செ.கே.சி. செ.கே.சி.	S.S. செ.கே.சி.
78.	A. செ.கே.சி. செ.கே.சி.	A. செ.கே.சி.
79.	V. செ.கே.சி. செ.கே.சி.	V. செ.கே.சி.
80.	S. செ.கே.சி. செ.கே.சி.	S. செ.கே.சி.

81	S. கருவையா	தென்னாற்காடு	திருச்சி
82	M. குத்தாடு	குத்தாடு	சென்னை
83	P. கைக்காடு	M. V. 450	சென்னை
84	S. கைக்காடு	புதுக்கோட்டை	சென்னை
85	D. கைக்காடு	புதுக்கோட்டை	சென்னை
86	V. கைக்காடு	புதுக்கோட்டை	சென்னை
87	M. கைக்காடு	புதுக்கோட்டை	சென்னை
88	S. P. கைக்காடு	புதுக்கோட்டை	சென்னை
88A	M. கைக்காடு	புதுக்கோட்டை	சென்னை
89	S. கைக்காடு	புதுக்கோட்டை	சென்னை
90	C. கைக்காடு	புதுக்கோட்டை	சென்னை
91	S. கைக்காடு	புதுக்கோட்டை	சென்னை
92	V. கைக்காடு	புதுக்கோட்டை	சென்னை
93	N. கைக்காடு	புதுக்கோட்டை	சென்னை
94	S. கைக்காடு	புதுக்கோட்டை	சென்னை
95	S. கைக்காடு	புதுக்கோட்டை	சென்னை
96	S. கைக்காடு	புதுக்கோட்டை	சென்னை
97	L. கைக்காடு	புதுக்கோட்டை	சென்னை
98	A. கைக்காடு	புதுக்கோட்டை	சென்னை
99	S. கைக்காடு	புதுக்கோட்டை	சென்னை
100	A. கைக்காடு	புதுக்கோட்டை	சென்னை
101	N. கைக்காடு	புதுக்கோட்டை	சென்னை
102	M. P. கைக்காடு	புதுக்கோட்டை	சென்னை
103	S. கைக்காடு	புதுக்கோட்டை	சென்னை
104	S. கைக்காடு	புதுக்கோட்டை	சென்னை
105	S. கைக்காடு	புதுக்கோட்டை	சென்னை
106	S. கைக்காடு	புதுக்கோட்டை	சென்னை
107	S. கைக்காடு	புதுக்கோட்டை	சென்னை
108	S. கைக்காடு	புதுக்கோட்டை	சென்னை
109	S. கைக்காடு	புதுக்கோட்டை	சென்னை

62		
110.	முத்துசாமி, கீழ்க்கண்ட	V.சுப்பிரமணியம்
111.	R.சுப்பிரமணியம், கீழ்க்கண்ட	R.சுப்பிரமணியம்
112.	S.சுப்பிரமணியம், T.சுப்பிரமணியம்	S.சுப்பிரமணியம்
113.	M.சுப்பிரமணியம், கீழ்க்கண்ட	M.சுப்பிரமணியம்
114.	S.சுப்பிரமணியம், 11	S.சுப்பிரமணியம்
115.	சுப்பிரமணியம், 11	
116.	M.சுப்பிரமணியம், 11	M.சுப்பிரமணியம்
117.	S.சுப்பிரமணியம், 11	S.சுப்பிரமணியம்
118.	சுப்பிரமணியம், கீழ்க்கண்ட	சுப்பிரமணியம்
119.	A.சுப்பிரமணியம், கீழ்க்கண்ட	A.சுப்பிரமணியம்
120.	D.சுப்பிரமணியம், 11	D.சுப்பிரமணியம்
121.	S.சுப்பிரமணியம், கீழ்க்கண்ட	S.சுப்பிரமணியம்
122.	P.சுப்பிரமணியம், கீழ்க்கண்ட	P.சுப்பிரமணியம்
123.	A.சுப்பிரமணியம், கீழ்க்கண்ட	A.சுப்பிரமணியம்
124.	L.சுப்பிரமணியம், கீழ்க்கண்ட	L.சுப்பிரமணியம்
125.	V.சுப்பிரமணியம், கீழ்க்கண்ட	V.சுப்பிரமணியம்

126	J. அழகவேலன்	M.V.450	J. அழகவேலன்
127	P. ஜெனரல்	M.V.450	P. ஜெனரல்
128	K. அபிராமிசாமி	பெட்ரோல் 450	K. அபிராமிசாமி
129	P. சந்திரபதி	கிண்டிபெட்ரோல்	P. சந்திரபதி
130	N. அனந்தசுப்பையன்	பெட்ரோல்	N. அனந்தசுப்பையன்
131	M. கனகசுப்பையன்	பெட்ரோல்	M. கனகசுப்பையன்
132	V. அழகவேலன்	பெட்ரோல் 450	V. அழகவேலன்
133	R. அழகவேலன்	பெட்ரோல் 450	R. அழகவேலன்
134	G. அனந்தசுப்பையன்	பெட்ரோல்	G. அனந்தசுப்பையன்
135	M. அனந்தசுப்பையன்	பெட்ரோல்	M. அனந்தசுப்பையன்
136	S. அழகவேலன்	பெட்ரோல் 450	S. அழகவேலன்
137	V. அனந்தசுப்பையன்	பெட்ரோல் 450	V. அனந்தசுப்பையன்
138	S. அழகவேலன்	பெட்ரோல் 450	S. அழகவேலன்
139	G. அழகவேலன்	பெட்ரோல் 450	G. அழகவேலன்
140	K. A. அனந்தசுப்பையன்	பெட்ரோல்	K. A. அனந்தசுப்பையன்
141	K. அனந்தசுப்பையன்	பெட்ரோல் 450	K. அனந்தசுப்பையன்
142	N. அனந்தசுப்பையன்	பெட்ரோல்	N. அனந்தசுப்பையன்
143	R. அனந்தசுப்பையன்	பெட்ரோல் 450	R. அனந்தசுப்பையன்
144	M. அனந்தசுப்பையன்	பெட்ரோல்	M. அனந்தசுப்பையன்
145	A. அனந்தசுப்பையன்	பெட்ரோல்	A. அனந்தசுப்பையன்
146	G. அனந்தசுப்பையன்	பெட்ரோல் 450	G. அனந்தசுப்பையன்
147	V. அனந்தசுப்பையன்	பெட்ரோல் 450	V. அனந்தசுப்பையன்
148	A. அனந்தசுப்பையன்	பெட்ரோல் 450	A. அனந்தசுப்பையன்

49	A. Subbaraj	General Manager	1/1/17
150	S. Subramanian	General Manager	1/1/17
151	B. Nuthu-Rajendran	Melavengalapuram	1/1/17
152	A. Arjunan	Sennamethipatti	1/1/17
153	A. Subbaraj	Koda Arunachala	1/1/17
154	C. Subbaraj	Chennai	1/1/17
155	D. Subbaraj	Chennai	1/1/17
156	A. Subbaraj	Chennai	1/1/17
157	V. Subbaraj	Chennai	1/1/17
158	P. Subbaraj	Chennai	1/1/17
159	V. N. Subbaraj	Chennai	1/1/17
160	Subbaraj	Chennai	1/1/17
161	Subbaraj	Chennai	1/1/17
162	Subbaraj	Chennai	1/1/17
163	Subbaraj	Chennai	1/1/17
164	Subbaraj	Chennai	1/1/17
165	A. Subbaraj	Chennai	1/1/17
166	P. Subbaraj	Chennai	1/1/17
167	P. Subbaraj	Chennai	1/1/17
168	Subbaraj	Chennai	1/1/17
169	S. Subbaraj	Chennai	1/1/17
170	P. Subbaraj	Chennai	1/1/17
171	S. Subbaraj	Chennai	1/1/17

11.12.	P. Suresh Babu	W. H.	2
11.12.	R. Lakshmi. Pudi	W. H.	2
11.12.	M. N. Srinivas, Srinivas	W. H.	2
11.12.	M. Srinivas. Y. Srinivas	W. H.	2
176.	N. Srinivas	N. Srinivas	1
177.	K. Srinivas Srinivas VAO Srinivas	W. H.	1
178.	S. Srinivas Srinivas	W. H.	1
179.	C. Srinivas	C. Srinivas	1
180.	P. Srinivas	P. Srinivas	1
181.	N. Srinivas	N. Srinivas	1
182.	S. Srinivas Srinivas	S. Srinivas Srinivas	1
183.	U. Srinivas	U. Srinivas	1
184.	G. Srinivas	G. Srinivas	1
185.	P. Srinivas Srinivas	P. Srinivas Srinivas	1
186.	V. Srinivas	V. Srinivas	1
187.	S. Srinivas	S. Srinivas	1
188.	K. Srinivas	K. Srinivas	1
189.	M. Srinivas	M. Srinivas	1
190.	K. Srinivas	K. Srinivas	1
191.	S. Srinivas Srinivas	S. Srinivas Srinivas	1
192.	E. Srinivas	E. Srinivas	1
193.	M. Srinivas	M. Srinivas	1
194.	K. Srinivas	K. Srinivas	1
195.	S. Srinivas Srinivas	S. Srinivas Srinivas	1
196.	V. Srinivas	V. Srinivas	1
197.	N. Srinivas	N. Srinivas	1
198.	K. Srinivas	K. Srinivas	1
199.	S. Srinivas	S. Srinivas	1
200.	V. Srinivas	V. Srinivas	1



201	R. Sripinasi, Annales	2
202	R. Sripinasi Annales	2
203	R. Sripinasi	2
204	B. Chetapandi Annales	2
205		2
206	S. Sripinasi, Annales	2
207	A. V. Sripinasi, Annales	2
208	S. Sripinasi, Annales	2
209	S. Sripinasi, Annales	2
210	V. Sripinasi, Annales	2
211	S. Sripinasi, Annales	2
212	S. Sripinasi, Annales	2

			65
Sl. No.	Owner Name	Address	Signature
213	A. Annalakshmi	Melavankateswarapuram	[Signature]
214	M. S. S. S. S.		[Signature]
215	P. S. S. S.		[Signature]
216	S. S. S. S.		[Signature]
217	M. S. S. S.		[Signature]
218	C. S. S. S.		[Signature]
219	S. S. S. S.		[Signature]
220	S. S. S. S.		[Signature]
221	S. S. S. S.		[Signature]
222	K. S. S. S.		[Signature]
223	S. S. S. S.		[Signature]
224	S. S. S. S.		[Signature]
225	K. S. S. S.		[Signature]
226	M. S. S. S.		[Signature]
227	S. S. S. S.		[Signature]
228	K. S. S. S.		[Signature]
229			

**NO FOREST LAND CERTIFICATE FROM TAMIL NADU FOREST
DEPARTMENT**

ANNEXURE - 16

From
Thiru. Vismiju Viswanathan, I.F.S.,
District Forest Officer (i/c),
Thoothukudi Division,
Thoothukudi – 628 101.


To
Thiru. Jagdish Babu,
Senior Deputy General Manager, (Mines),
Tvl. The Ramco Cements Ltd.,
Ramasamy Raja Nagar,
Virudhunagar District.

C.No. D/5975/2016-2, Dated: 09.02.2017.

Sir,

- Sub :** Request for issue of "No Forest Land certificate" in mining lease hold area granted vide G.O. (Ms.) No. 168, Industries (MMA.1), Department, Dated, 17.11.2014 – to Tvl. The Ramco cements Ltd., - regarding.
- Ref :**
1. G.O. (Ms.) No. 168, Industries (MMA.1), Department, Dated, 17.11.2014.
 2. Letter from Senior Deputy General Manager (Mines), Tvl. The Ramco Cements Ltd., Virudhunagar, Dated, 23.12.2016 & 27.12.2016
 3. Forest Range Officer, Vilathikulam, Dated, 06.02.2017

I wish to inform that "No Forest Land is involved" in the area held under limestone mining lease granted to Tvl. The Ramco Cements Limited, vide G.O. (Ms.) No. 168, Industries (MMA.1), Dated, 17.11.2014 over an extent of 98.62.0 hectares (74.19.5 Ha., of Sennayampatti village, 19.83.00 Ha., of Pudur village & 4.59.5 Ha., of Nadukattur village) of, Vilathikulam Taluk, Thoothukudi District.


District Forest Officer, (i/c)
Thoothukudi Division,
Thoothukudi.


9.2.17

CERTIFIED PEAFOWL CONSERVATION PLAN

ANNEXURE - 17

e-mail: dfotthothukudi@gmail.com

Tamil Nadu Forest Department

From
Thiru. Visniju Viswanathan, I.F.S.,
District Forest Officer (i/c),
Thoothukudi Division,
Thoothukudi - 628 101.

To
Thiru. Jagdish Babu,
Senior Deputy General Manager, (Mines),
Tvl, The Ramco Cements Ltd.,
Ramasamy Raja Nagar,
Virudhunagar District.

C.No. D/3975/2016, Dated:05.04.2017.

Sir,

Sub: Conservation plan for peafowl prepared by M/s. Creative Engineers, Chennai for limestone mines in Pandalgudi area and RR Cements Plant of The Ramco Cements Ltd., - regarding.

Ref: Letter from Senior Deputy General Manager (Mines), Tvl, The Ramco Cements Ltd., Virudhunagar, Dated, 25.01.2017.


This is to certify that the pea fowl conservation plan prepared for Tvl, The Ramco Cements Ltd., by M/s Creative Engineers, Chennai for their group of limestone mines situated in Vilathikulam Taluk and cement plant at Ramasamyraja Nagar is in consultation with Forest Range Officer, Vilathikulam. The implementation of the pea fowl conservation plan will be monitored by the Forest Range Officer, and field staff periodically. The Company should comply and implement all the proposals made in the conservation plan and submit annual progress report to this office. Copy of the peafowl conservation plan is enclosed.

Encl: As above.

Sd/- Visniju Viswanathan,
District Forest Officer, (i/c)
Thoothukudi Division,
Thoothukudi.

/True copy /By order/

Supertendent.



COMBINED CONSERVATION PLAN FOR PEA FOWL

FOR

ALL THE LIMESTONE MINES IN PANDALGUDI

AREA AND RR NAGAR CEMENT PLANT

OF

THE RAMCO CEMENTS LIMITED



Prepared by

S. Saravanan
S. SARAVANAN, M.Sc., M.Phill.

S.SARAVANAN

(Ecology & Biodiversity Expert)

Approved by NABET, Quality Council of India, New Delhi-110002

Creative Engineers & Consultants

NABET ACCREDITED, NABL ACCREDITED TESTING LABORATORY &

ISO 9001: 2008 CERTIFIED COMPANY

Chennai-600 059, Ph: 044-22385170, Cell: 09444133619

Email: ceogiri@yahoo.com, Web: www.creativeengineers.co.in

JANUARY - 2017

CONSERVATION PLAN FOR PEA FOWL

CHAPTER – I

INTRODUCTION

1.0 GENERAL

M/s. The Ramco Cements Limited (TRCL) is operating a cement plant with 2.0 MTPA capacity at Ramasamy Raja Nagar (RR Nagar) in Virudhunagar District of Tamil Nadu.

Presently, the raw material for this cement plant is met from the following mines in the Pandalgudi region:

- Sivalarpatti
- Melvenkateswarapuram mines (MV Puram)
- Pandalgudi
- Maravarperungudi

TRCL has filed a Fresh lease application over an area of 129.72 Ha in Kullakattankurichi, Pudur, Muthusampuram, Sivalarpatti and Vannipatti villages, Vilathikulam Taluk, Thoothukudi District.

The maximum production of 0.21 Million TPA of limestone (0.24 Million TPA of ROM) is proposed and the entire limestone will be supplied by road to RR Nagar cement plant.

This applied lease area of Sivalarpatti limestone mine lease - II of M/s. TRCL is adjoining to their existing lease of Sivalarpatti - I- Extent – 150.11 Ha given vide G.O.Ms.No.334 dated 23.12.1994.

1.1 LOCATION AND APPROACHABILITY

Sivalarpatti limestone mine lease – II (Extent - 129.72 Ha) is located in Kullakattankurichi, Pudur, Muthusampuram, Sivalarpatti and Vannipatti villages, Vilathikulam Taluk, Thoothukudi District, Tamilnadu State.

In total mine lease area of 129.72 Ha, an area of 0.975 Ha is Government land and 128.745 Ha is patta land. Entire patta lands applied for Mining Lease is under TRCL's possession.

The area is approachable by a black top road leading from Pudur to Melarunachalapuram village via Melvenkateswarapuram. The area can also be reachable by a road leading from Sivalarpatti village to Kambathupatti village. The project site is well connected with major district towns, being accessible from Madurai, via Aruppukkottai and from port city of Thoothukudi via Vilathikulam by all-weather black topped road. The road distance from Madurai is about 80

CONSERVATION PLAN FOR PEA FOWL

kms and the nearest rail head at Aruppukkottai is at a road distance of about 27 kms from the study area. Pudur, located at a road distance of 4 Kms,

The area lies in Survey of India Toposheet No.58 K / 3 between coordinates Latitude 9°17'47" to 9°19'59" N and Longitude 78°08'33" to 78°09'54" E. The Location Plan is given in Figure No 1.

Figure No 1. Location Plan of TRCL's Mine Leases and RR Nagar Cement Plant



1.2 TOPOGRAPHY AND DRAINAGE

The area applied for mining lease is generally flat with an elevation ranging from 61 to 67 metres above MSL. There is no prominent river or stream running in this area except small ponds of seasonal nature. All the lands are of dry type with wild growth bushes in the study area. There is no forest present in the nearby area. The study area is covered with top soil cover ranging 1.0 to 1.50m. The Toposheet Image of study area is given in Figure No 2.

CONSERVATION PLAN FOR PEA FOWL

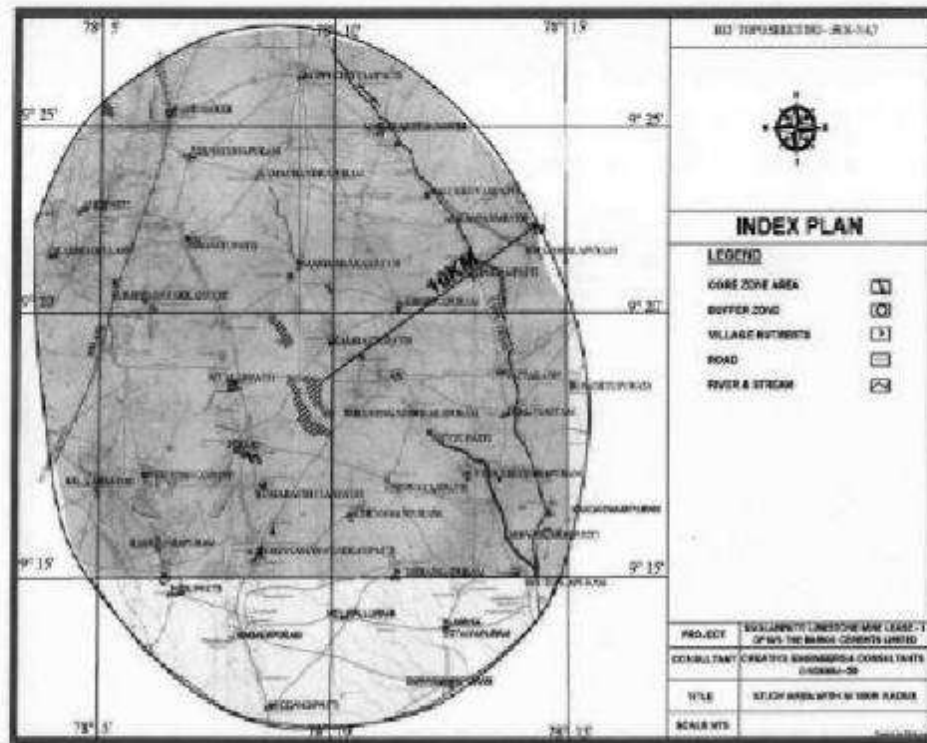


Figure No 2. Toposheet image of the buffer area around Sivalarpatti ML and its environment

CONSERVATION PLAN FOR PEA FOWL

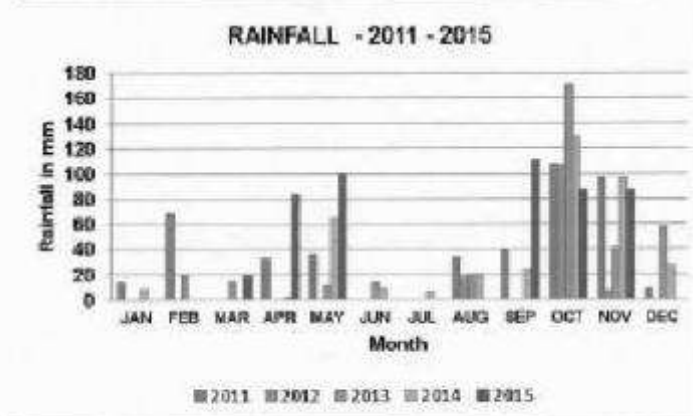
5.3 CLIMATE

Climate of the study area is hot during summer with temperature soaring up to 42° C and receives SW monsoon with intermittent summer give respite to summer heat. In winter, the average temperature is recorded around 20° C. Northeast monsoon is the major contributor of rainfall contributing nearly 65% of the rainfall aiding surface drainage and saturating storage ponds. Such climatic condition and limitation shown by soil, mostly rain fed crops are grown in the study area.

The nearest Rainfall gauge station is located at Aruppukottai which is at a distance of about 25 km on the North from the M.V.Puram Mine. The Fifty years of Normal Rainfall recorded is 769 mm out of which, normal NE Monsoon Rainfall is 392.0 mm (Oct-Dec) Normal SW Monsoon Rainfall is 184.0 mm (Jun-Sep) Transit period rainfall from Jan to May is 193.0 m. The average rainfall in the area is 460 mm only.

The rainfall data monitored at adjoining Mine site of Sivalarpatti Limestone Mine between 2011- 2015 is given in shown in below

Graphical representation of Rainfall data near the mine site (2011 - 2015)



Source: The Ramco Cements Limited rain gauge station.

CONSERVATION PLAN FOR PEA FOWL

1.4 NEED FOR THIS STUDY

During the fauna survey, Peafowl coming under Schedule I (as per Wild Life (Protection) Act, 1972) was observed in the study area. In the Terms of Reference for SIVALARPATTI LIMESTONE MINE issued by Ministry of Environment, Forest and Climate change vide their letter No. "Dated 13.05.16 no. IA/TN/MIN/51673/2016" under serial No. 18 it is stated that "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."

In compliance to this TOR condition, combined conservation plan for Peafowl is prepared for all the limestone mines of TRCL in Pandalgudi area namely Sivalarpattilimestone mine (Existing) ,Pandalgudilimestone mine, Melavenkateswarapuram limestone mine, Maravarperugudilimestone mine, Proposed Sivalarpatti – II mine and also for RR nagacement Plant of M/S. The Ramco Cements Limited.

Details of existing status of Land Use & Land Cover of the study area, Ecology and Biodiversity of the study area, Impacts due to the project and Mitigation Measures and finally the combined conservation plan for Peafowl are given in this report.

CONSERVATION PLAN FOR PEA FOWL

CHAPTER – II

LAND USE & LAND COVER OF THE STUDY AREA

2.0 REMOTE SENSING SATELLITE DATA USED FOR THE STUDY

In the present study, remote sensing satellite data LISS IV of Resourcesat2 has been used to study the land use pattern. Figure No.3. Categories showing different land use and land cover around 10 km radial buffer with Sivalarpatti limestone ML area (129.72 ha) is delineated and mapped in GIS environment. The 10 km radial buffer constructed for the above ML area and the radial buffer around the ML is 421.158 Sq.Km and the land use map was shown in Figure No.4.

The area has been divided into two zones, namely, core and buffer zones. Core zone is considered as the total lease area of Sivalarpatti Limestone Mine lease - II, while buffer zone encompasses an area of 10 km radius distance from the periphery of core zone. Land use pattern of the study area as per GIS is given in Table No 1

Agricultural Land: In the present study, scattered land parcels are seen around Vadakunatham, Krishnasamipuram, Madhalapuram, Jegaveerapuram, Pudur and Vembur. Many such Land parcels are seen along the water courses and suggest an influence of terrain condition in the agricultural activity. Spatial extent of crop land is estimated at 46.38 Sq.km representing 11.01% of the total buffer area

Fallow Land: It covers an area of 317.69 Sq.Km and represents 75.43% of the study area. Almost the entire buffer area is seems to be "fallow".

Plantation: Plantation is spread to an area of 4.98 sq.km covering 1.18% of the total buffer area. Few land parcels near Pudur, Pandalgudi and Melakandai are seen with plantation crops mostly banana and papaya.

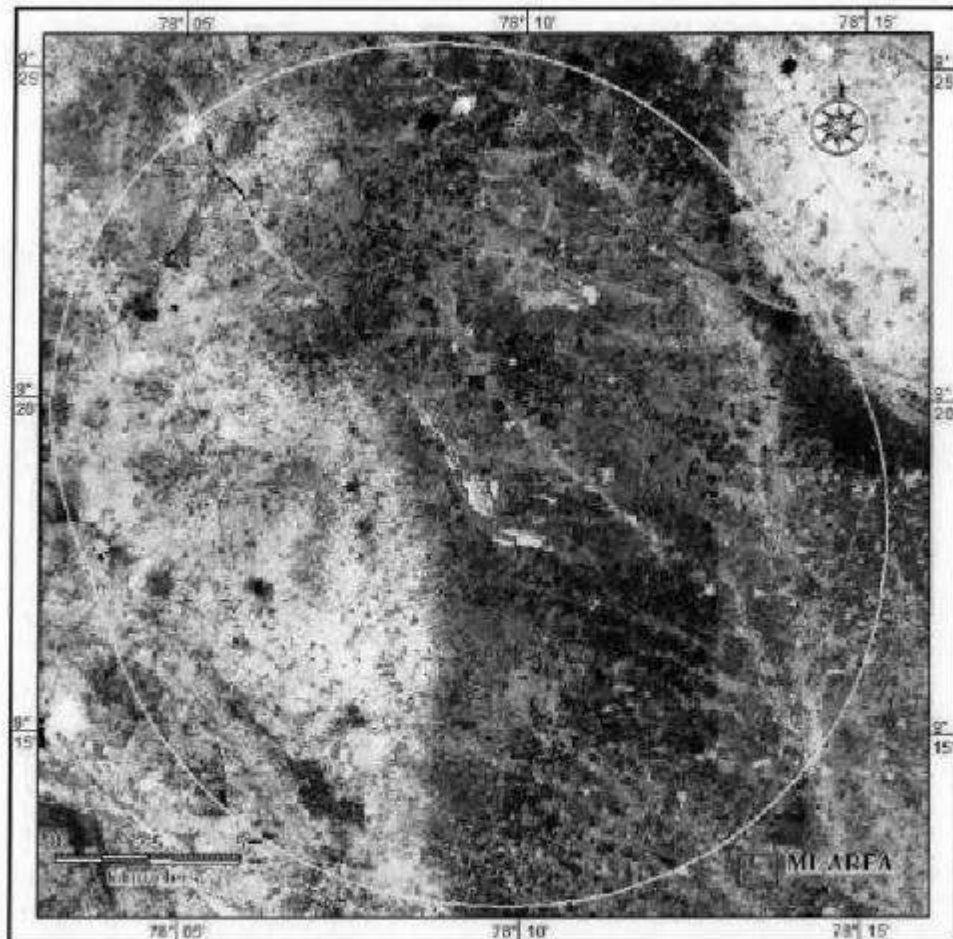
Land with Scrub: It occupies an area of 29.10 sq.km representing 6.91% of the total buffer area.

Land without scrub occur as small patches and show very small spatial extent covering 3.68 sq.km representing 0.88% of the buffer area.

Waterbodies occupies 2.69 sq.km representing 0.64 % of the total buffer area.

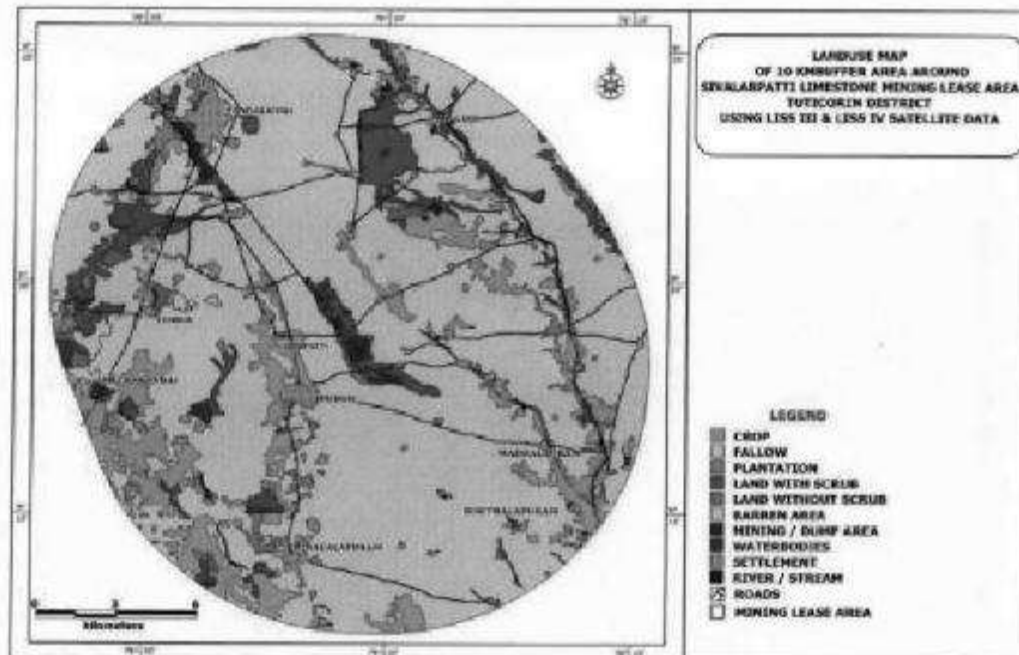
CONSERVATION PLAN FOR PEA FOWL

FigureNo3. Remote sensing satellite image of the buffer area around Sivalarpatti ML and its environ



CONSERVATION PLAN FOR PEA FOWL

Figure No.4. Landuse map of 10 Km radial buffer around Sivalarpatti Limestone ML area



CONSERVATION PLAN FOR PEA FOWL

Table No. 1. Landuse Categories within 10 Km Buffer zone and their Spatial Extent

S.No	LU Categories	Area (in Sq.km)	Percentage
1	Crop	46.3763	11.01
2	Fallow	317.6921	75.43
3	Plantation	4.9841	1.18
4	Land with Scrub	29.1029	6.91
5	Land without Scrub	3.6885	0.88
6	Barren Area	0.7924	0.19
7	Mines / Dumps	2.8771	0.68
8	Waterbodies	2.6972	0.64
9	Settlement	11.7958	2.80
10	River	1.1520	0.27
	Total	421.1583	100.00

From the above table it is seen that Fallow land and crop land constitutes about 86% of the study area.

CONSERVATION PLAN FOR PEA FOWL

CHAPTER – III

Ecology and Biodiversity

3.1 FLORA:

A systematic study was carried out to evaluate their current status Flora and Fauna in Core and Buffer Zone. Ecological questionnaire survey also carried out along the observed buffer zone villages for their visual observation and activities of Fauna. The details were given below.

METHODOLOGY

An ecological survey of the study area was conducted by following methods

1. Line transect method (LT)

Line Transect method was used in plant inventory, a total of four transect were laid i.e. NE (LT-1), NW (LT-2) SW (LT-3) and SE (LT-4). Lines transect (LT) have been examined for representative depending upon prevailing geographical conditions and bio-diversity aspects of study area.

2. PRA methods

Interacting with the local village ranged from older people to young people to gain the traditional knowledge about the flora and fauna.

3. Collect secondary data from Government records as well as through discussion with Forest officials, knowledgeable public etc.

To accomplish the above objectives, a general ecological survey covering an area of 10 km radius was conducted. The Species were identified using regional floras (Gamble and Fischer 1921- 1935; Matthew 1991; Nair and Henry 1983; Henry et al. 1987; Henry et al. 1989).

RESULTS:

A detailed studies in both core and buffer area has been carried out to assess the present floristic composition in the region. We have recorded a total of 135 plant life form. In that a total of 41 tree species followed by 19 shrub species, 29 herb species, 8 climber species and 38 grass species. The Details are given in Table No 2.

TableNo 2. Overall species richness of plants coming in 10-km radius buffer area

CONSERVATION PLAN FOR PEA FOWL

Sl. No.	Habit	Core	Buffer				Overall
			LT 1	LT 2	LT 3	LT 4	
1	Trees	7	32	29	28	31	41
2	Shrubs	5	13	12	14	11	19
3	Herbs	7	22	20	15	16	29
4	Climbers	3	5	5	4	5	8
5	Grass	5	21	17	19	14	38

FLORA IN CORE ZONE:

The core zone of the lease area is mostly barren interspersed with thorny bushes and few plantations. (Refer Photo No.1 A&1B).



Photo No. 1 A – Barren Land



Photo No. 1 B – *Prosopis juliflora*

Total of 7 tree species of 5 families followed by 5 species of shrubs belonging to 6 families, 7 species of herbs of 5 families, 3 species of climber belonging to 3 families and 5 species of grasses belonging to 2 families were found in the core zone Table No 3. The predominant tree species in the core zone is *Prosopis juliflora* and *Acacia nilotica*. Besides some *Calotropis gigantea*, few *Ziziphus juba*, less number of prostrate herbs like *Solanum xanthocarpum*, *Tephrosia purpuria* etc. are found.

Table No 3. List of species observed in Core zone

CONSERVATION PLAN FOR PEA FOWL

Sl.No	Species	Family	Local Name
Trees			
1.	<i>Azadirachta indica</i>	Meliaceae	Vembu
2	<i>Accacia nilotica</i>	Mimosoidae	Karuvelan
3	<i>Bougainvillea</i>	Nicotianaceae	Kagithapoo
4	<i>Delonaxia</i>	Caesalpinaceae	Gulmohar
5	<i>Pithecellobium dulce</i>	Caesalpinaceae	Kilukiluppai
6	<i>Phoenix sylvestris</i>	Palmaeae	Eeachamaram
7	<i>Prosopis juliflora</i>	Mimosoidae	Vealimul
Shrub			
1	<i>Calotropis gigantea</i>	Asclepiadaceae	Erukku
2	<i>Jatropha glandulifera</i>	Euphorbiaceae	Oil plant
3	<i>Lantana camara</i>	Verbinaceae	Putus
4	<i>Neerium indicum</i>	Apocynaceae	Arali
5	<i>Zizypus jujube</i>	Rhamnaceae	Elanthai
Herb			
1	<i>Acalypha indica</i>	Amaranthaceae	Kupaimenikeeri
2	<i>Solanum nigrum</i>	Solanaceae	Manattakalli
3	<i>Achyranthus aspera</i>	Amaranthaceae	Nayuruvi
4	<i>Cleome viscosa</i>	Cleomaceae	Naaivelai
5	<i>Tephrosia purpurea</i>	Fabaceae	Vayalpoondur
6	<i>Tridax procumbens</i>	Asteraceae	Vettukalpoondur
7	<i>Sida acuta</i>	Malvaceae	Vattatrippi

CONSERVATION PLAN FOR PEA FOWL

Climber			
1	<i>Abrus precatorius</i>	Fabaceae	Indian licorice
2	<i>Cardiospermum halicacabum</i>	Sapindaceae	Ballon plant
3	<i>Cissus quadrangularis</i>	Vitaceae	Pirandai
Grasses			
1	<i>Andropogon foulkesii</i>	Gramineae	Bluestem Grass
2	<i>Cynodon dactylon</i>	Gramineae	Arugampul
3	<i>Eragrostis nigra</i>	Gramineae	Candy grass
4	<i>Kyllinga cylindrica</i>	Cyperaceae	Spike sedges
5	<i>Tripsacum daniellii</i>	Gramineae	-

FLORA OF BUFFER ZONE

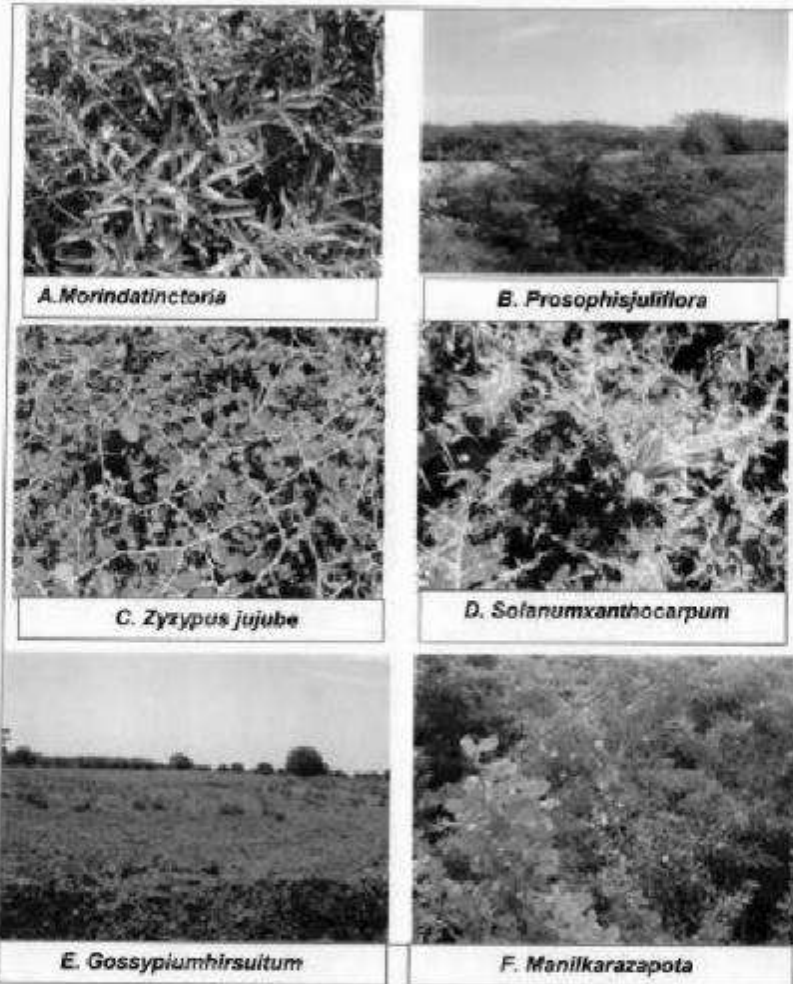
The buffer zone has vast stretches of fallow land, mostly dry land. The lands with dry scattered bushes and wild growth support goat rearing in the area. There are no forest areas within the buffer zone.

A total of 41 tree species belonging to 36 families followed by 19 species of shrubs from 13 families, 29 species of herbs belonging to 19 families, 8 species of climber belonging to 6 families and 38 species of grasses belonging to 5 families were observed in the study area. The dominant tree species are *Prosopis juliflora*, *Pterocarpus indicus*, *Acacia nilotica*, *Tamarindus indica* etc. The dominant shrubs consists of, *Cassia auriculata*, *Canis carandas*, *Dodonaea viscosa*, *Euphorbia antiquorum*, *Gmelina*, *Randia dumetorum* etc. The climbers consists of *Acacia intsia*, *Ziziphus oenopia*, *Abrus precatorius* and the prominent herbs are *Aerolana*, *Sida cordifolia*, *Solanum xanthocarpum*, *Croton spiciflorus*, *Tridax*, *Vadalia* etc., Photos No 2.

CONSERVATION PLAN FOR PEA FOWL

List of common species in buffer zone

Photo No. 2



Limitation exhibited by soil condition also imposes certain constraint in landuse and

CONSERVATION PLAN FOR PEA FOWL

Table No 4. The detailed list of species found in line transects and in buffer zone are given below

S.NO	BOTANICAL NAME	TAMIL NAME	FAMILY NAME
Trees			
1	<i>Azadirachta indica</i>	Vembu	Meliaceae
2	<i>Peltophorum pterocarpum</i>	Kilukiluppai	Fabaceae
3	<i>Prosopis juliflora</i>	Seemaikaruvel	Fabaceae
4	<i>Tamarindus indica</i>	Puli	Fabaceae
5	<i>Tectonagrandis</i>	Tekku	Lamiaceae
6	<i>Pongamia pinnata</i>	Pungai	Fabaceae
7	<i>Pongamia glabra</i>	Kattupungai	Fabaceae
8	<i>Moringa oleifera</i>	Murungai	Moringaceae
9	<i>Eucalyptus lanciolatus</i>	Thailamaram	Myrtaceae
10	<i>Phoenix sylvestris</i>	Eeachamaram	Arecaceae
11	<i>Albizia amara</i>	Vagai	Fabaceae
12	<i>Acacia nilotica</i>	Karuvelan	Fabaceae
13	<i>Polyalthia longifolia</i>	Nietilingam	Annonaceae
14	<i>Psidium guajava</i>	Koyya	Myrtaceae
15	<i>Cocos nucifera</i>	Tennai	Arecaceae
16	<i>Ficus benghalensis</i>	Aalamaram	Moraceae
17	<i>Ficus religiosa</i>	Poarasamaram	Moraceae
18	<i>Ficus hispida</i>	Aarasu	Moraceae
19	<i>Pithecellobium dulce</i>	Kodukkapuli	Fabaceae
20	<i>Dalmanea regia</i>	Gulmohar	Fabaceae
21	<i>Casuarina equisetifolia</i>	Savukku	Casuarinaceae

CONSERVATION PLAN FOR PEA FOWL

S.NO	BOTANICAL NAME	TAMIL NAME	FAMILY NAME
22	<i>Mangifera indica</i>	Maamaram	Anacardiaceae
23	<i>Artocarpus heterophyllus</i>	Palamaram	Moraceae
24	<i>Murraya koenigii</i>	Curry leaf	Rutaceae
25	<i>Citrus medica</i>	Lemon	Rutaceae
26	<i>Plumeria acuminata</i>	Alari	Apocynaceae
27	<i>Carica papaya</i>	Pappali	Caricaceae
28	<i>Odinawodier</i>	Oodiyar	Anacardiaceae
29	<i>Tecomaria stans</i>	Yellow trumpet bush	Loganiaceae
30	<i>Samanea saman</i>	Rain tree	Fabaceae
31	<i>Phoenix Sp</i>	Panai	Arecaceae
32	<i>Bougainvillea</i>	Bougainvillea	Nyctaginaceae
33	<i>Sterculia foetida</i>	Kutiraippitukku	Malvaceae
34	<i>Caesalpinia pulcherrima</i>	Mayilkondrai	Fabaceae
35	<i>Pterocarpus macleodii</i>	Poovarasoo	Malvaceae
36	<i>Achras sapota</i>	Sappota	Sapotaceae
37	<i>Phyllanthus emblica</i>	Nelli	Phyllanthaceae
38	<i>Anacardium occidentale</i>	Munthiri	Anacardiaceae
39	<i>Annona squamosa</i>	Siththa	Annonaceae
40	<i>Musa x paradisiaca</i>	Valzhai	Musaceae
41	<i>Syzygium cumini</i>	Navai	Myrtaceae
Shrubs			
1	<i>Sida cordifolia</i>	Sida plant	Malvaceae
2	<i>Sida acuta</i>	Palambasi	Malvaceae
3	<i>Ziziphus jube</i>	Elanthai	Rhamnaceae

CONSERVATION PLAN FOR PEA FOWL

SL.NO	BOTANICAL NAME	TAMIL NAME	FAMILY NAME
4	<i>Cassia auriculata</i>	Aavarampoo	Fabaceae
5	<i>Daturametel</i>	Oomaththai	Solanaceae
6	<i>Calotropisgigantea</i>	Eerukku	Apocynaceae
7	<i>Gaesaipiniabonducella</i>	Kalichikai	Caesalpiniaaceae
8	<i>Jatropha glandulifera</i>	Oil plant	Euphorbiaceae
9	<i>Achatodavastica</i>	Adathoda	Acanthaceae
10	<i>Hibiscus rosa-sinensis</i>	Semparuthi	Malvaceae
11	<i>Nerium oleander</i>	Arali	Apocynaceae
12	<i>Lantana camara</i>	Pulus	Verbinaceae
13	<i>Ixoncasei</i>	Idipoo	Rubiaceae
14	<i>Lagerstroemia indica</i>	Crape myrtle	Lythraceae
15	<i>Lawsonianermis</i>	Maruthani	Lythraceae
16	<i>Jasminumgrandiflorum</i>	Malligai	Oleaceae
17	<i>Partheniumhysterophorus</i>	Parthenium	Asteraceae
18	<i>Rosa indica</i>	Rose	Rosaceae
19	<i>Solanumxanthocarpum</i>	Kandangkattari	Solanaceae
Cactus			
1	<i>Opuntiadillen</i>	Sappathikalli	Cactaceae
2	<i>Agave americana</i>	Kaththalzhi	Asparagaceae
3	<i>Cereus peruvianus</i>	Kalli	Cactaceae
4	<i>Cereus trifolia</i>	Thirukkalli	Cactaceae
Herbs			
1	<i>Acalyptaindica</i>	Kupaimenikeen	Euphorbiaceae
2	<i>Acanthospermumhispidum</i>	Gokulkanta	Asteraceae

CONSERVATION PLAN FOR PEA FOWL

Sl.NO	BOTANICAL NAME	TAMIL NAME	FAMILY NAME
3	Achyranthesaspera	Nayuruvi	Amaranthaceae
4	Andrographiszechoides	Birkubat	Acanthaceae
5	Andrographispaniculata	Kirayil	Acanthaceae
6	Amaranthusviridis	Green amaranth	Amaranthaceae
7	Argemone mexicana	Mexican poppy	Papaveraceae
8	Alyosiascarabaeoides	Venkuthi	Fabaceae
9	Boerhaviserecta	Erect spiderling	Nyctaginaceae
10	Cleome viscosa	Naaivelai	Cleomaceae
11	Coleus amboinicus	Indian borage	Lamiaceae
12	Cosmos caudata	Ulam raja	Compositae
13	Croton sparsiflorus	Poodusedi	Euphorbiaceae
14	Cupheahyssopifolia	Elfin herb	Lythraceae
15	Digeramuricata	False amaranth	Amaranthaceae
16	Gynandropsispentaphylla	Nailavelai	Cleomaceae
17	Kalanchoeblossfeldiana	Kalanchoes	Crassulaceae
18	Leucasaspera	Thumbai	Lamiaceae
19	Mimosa pudica	Touch me not	Fabaceae
20	Phyllanthusniruri	Keelzhaneeli	Phyllanthaceae
21	Polycarpaeacorymbosa	Old man's cap	Carryophyllaceae
22	Solanumnigrum	Manattthakali	Solanaceae
23	Sphaeranthusindicus	Indian globe thisle	Asteraceae
24	Tephrosiapurpurea	Vayalpoondur	Fabaceae
25	Tridaxprocumbens	Vettukaipoondur	Asteraceae
26	Glandulariabipinnatifida	Purple praire	Verbanaceae

CONSERVATION PLAN FOR PEA FOWL

SI.NO	BOTANICAL NAME	TAMIL NAME	FAMILY NAME
27	Vincarosea	Nithiyakalyani	Apocynaceae
28	Wedelliacalendulacea	Aster	Asteraceae
29	Xanthium strumarium	Rough cocklebur	Asteraceae
Climbers			
1	Abrusprecatorius	Indian licorice	Fabaceae
2	Cardiospermumhalicacabum	Ballon plant	Sapindaceae
3	Cocciniaindica	Kovai	Cucurbitaceae
4	Convolvulus sps	-	Convolvulaceae
5	Ipomiacarnea	Pink morning glory	Convolvulaceae
6	Luffecylindrica	Peirkai	Cucurbitaceae
7	Cissusquadrangularis	Pirandai	Vitaceae
8	Asparagus racemosus	Shatawari plant	Asparagaceae
Grasses:			
SI.NO	Species Name	TAMIL NAME	Family Name
1	Commelinaclavata	Thanneervittan	Commelinaceae
2	Anelamafanuginosum	Marsh Dewflower	Commelinaceae
3	Cyanotrispilosa	Wight's Dew-Grass	Commelinaceae
4	Juncusglaucus	Sea-Green Rush	Juncaceae
5	Juncusprismatocarpus	Branching rush	Juncaceae
6	Juncusbutonius	Toad Rush	Juncaceae
7	Luzulacampestris	Good Friday grass	Juncaceae
8	Eriocaulonbrownianum	Pipeworts	Eriocaulaceae
9	Eriocauloncollinum	Pipeworts	Eriocaulaceae
10	Kylingamelanosperma	Spike sedges	Cyperaceae

CONSERVATION PLAN FOR PEA FOWL

SI.NO	BOTANICAL NAME	TAMIL NAME	FAMILY NAME
11	<i>Kyllingacylindrica</i>	Spike sedge	Cyperaceae
12	<i>Pycreusgloboisus</i>	Rice paddy path	Cyperaceae
13	<i>Pycreusunioloides</i>	-	Cyperaceae
14	<i>Meriscuscyperinus</i>	Kupiupi	Cyperaceae
15	<i>Fimbristyliskingii</i>	Rusty sedge	Cyperaceae
16	<i>Fimbristylisuliginosa</i>	Rusty sedge	Cyperaceae
17	<i>Carexrubigens</i>	Sedge	Cyperaceae
18	<i>Carexphacota</i>	Sedge	Cyperaceae
19	<i>Carexfulicina</i>	Sedge	Cyperaceae
20	<i>Carexmyosurus</i>	Sedge	Cyperaceae
21	<i>Isachneaustralis</i>	Kunth's Millet	Poaceae
22	<i>Panicumvillosum</i>	Bug-seed grass	Poaceae
23	<i>Opismenusundulatifolius</i>	Pink muhlygrass	Poaceae
24	<i>Arundinellafusca</i>	Reedgrass	Poaceae
25	<i>Setariaglauca</i>	Koralaepuliu	Poaceae
26	<i>Cyanodondactylon</i>	Arugampul	Poaceae
27	<i>Polliniaquadrinervis</i>	kalutakkali	Poaceae
28	<i>AndropogonSp</i>	Bluestem Grass	Poaceae
29	<i>Chrysopogonzeylanicus</i>	kampuputpi	Poaceae
30	<i>Heteropogoncontortus</i>	Black Speargrass	Poaceae
31	<i>Cymbopogonpolynaeus</i>	Malabar Grass	Poaceae
32	<i>Cymbopogonsp</i>	Karppurappul	Poaceae
33	<i>Calamagrostispilosula</i>	Reedgrass	Poaceae
34	<i>Zenkeriaelegans</i>	-	Poaceae

CONSERVATION PLAN FOR PEA FOWL

Sl.No	BOTANICAL NAME	TAMIL NAME	FAMILY NAME
35	<i>Tripsacodromoides</i>	-	Poaceae
36	<i>Eragrostis amabilis</i>	Chinese Lovegrass	Poaceae
37	<i>Eragrostis sp</i>	Candy grass	Poaceae
38	<i>Festucabromoides</i>	Vulpia hair grass	Poaceae
CULTIVATED CROPS:			
Sl.No	Species Name	Local Name	Family Name
1	<i>Vignamungo</i>	Ulunthu	Fabaceae
2	<i>Sorghum vulgare</i>	Solan	Poaceae
3	<i>Musa paradisiaca</i>	Valzhai	Musaceae
4	<i>Cocos nucifera</i>	Tennai	Areaceae
5	<i>Gossypium hirsutum</i>	Paruthithi	Malvaceae
6	<i>Ricinus communis</i>	Amanakku	Euphorbiaceae
7	<i>Helianthus annuus</i>	Sun flower	Asteraceae
8	<i>Pisum sativum</i>	Avarai	Fabaceae
9	<i>Cyamopsis tetragonoloba</i>	Koththavarai	Fabaceae
10	<i>Pennisetum glaucum</i>	Kampud	Poaceae
11	<i>Solanum melongena</i>	Kaththari	Solanaceae
12	<i>Capsicum annum</i>	Red chilli	Solanaceae

CONSERVATION PLAN FOR PEA FOWL

3.2 FAUNA

There is no Wild Life Sanctuary or National Park or Biosphere within the study area of 10 km. The fauna species found in the buffer zone are given below. Other than Peafowl there are no schedule – I items in the study area. A consolidated list of fauna species in the study area are given in Table No.5.

TableNo 5.LIST OF FAUNA SPECIES IN THE STUDY AREA

Common Name	Species Name	Schedule Species*
MAMMALS		
Palm civet	<i>Paradoxurus hermaphroditus</i>	SCH – II
Hare	<i>Lepus nigricollis</i>	SCH – IV
Thres striped palm squirrel	<i>Funambulus palmarum</i>	SCH – IV
BIRDS		
Dove	<i>Chalcophaps indica</i>	SCH – IV
Cuckoo	<i>Cuculus micropterus</i>	SCH – IV
Egret	<i>Egretta garzetta</i>	SCH – IV
Common Myna	<i>Acridothera tristis</i>	SCH – IV
King fisher	<i>Alcedo althia</i>	SCH – IV
Owl	<i>Tyto alba</i>	SCH – IV
Parakeets	<i>Psittacula krameri</i>	SCH – IV
Partridge	<i>Francolinus pondicerianus</i>	SCH – IV
Quail	<i>Perdix asiatica</i>	SCH – IV
Peafowl	<i>Pavocristatus</i>	SCH – I
REPTILES		
Cobra	<i>Naja naja</i>	SCH – II
Ground lizard	<i>Mabuyacrinata</i>	
Krait	<i>Bungarus caeruleus</i>	SCH – IV
Tree lizard	<i>Coleleaverai color</i>	

* - Schedule specified in Wild Life Protection Act – 1972

CONSERVATION PLAN FOR PEA FOWL

Other than Peafowl no Schedule-I species are found in the study area

CHAPTER – IV

CONSERVATION PLAN FOR PEA FOWL (SCHEDULE 1 SPECIES)

4.1 OUTLINE

The peafowl comprise of two Asiatic bird species (the blue or Indian peafowl originally of India and Sri Lanka and the green peafowl of Myanmar, Indochina, and Java) and one African species (the Congo peafowl native only to the Congo Basin) of birds in the genera *Pavo* and *Afropavo* of the Phasianidae family. The word peacock is referred to male and peahen is referred to Female.

4.2 TAXONOMY AND NAMING

Carl Linnaeus in his work *Systema Naturae* in 1758 assigned to the Indian peafowl the technical name of *Pavocristatus*.

4.3 DISTRIBUTION AND HABITAT

The Indian Peafowl *Pavocristatus* is the national bird of India, and 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.

4.4 DESCRIPTION

Peacocks are a larger sized bird with a length from bill to tail of 100 to 115 cm and to the end of a fully grown train as much as 195 to 225 cm and weigh 4–6 kg. Peahens smaller at around 95 cm in length and weighs 2.75–4 kg. Indian peafowl are among the largest and heaviest representatives of the Phasianidae. Their size, colour and shape of crest make them unique within their native distribution range. The male is metallic blue on the crown, the feathers of the head being short and curled. The fan-shaped crest on the head is made of feathers with bare black shafts and tipped with bluish-green webbing. A white stripe above the eye and a crescent shaped white patch below the eye are formed by bare white skin. The sides of the head have iridescent greenish blue feathers.

CONSERVATION PLAN FOR PEA FOWL

The back has scaly bronze-green feathers with black and copper markings. The scapular and the wings are buff and barred in black, the primaries are chestnut and the secondaries are black. The tail is dark brown and the "train" is made up of elongated upper tail coverts (more than 200 feathers, the actual tail has only 20 feathers) and nearly all of these feathers end with an elaborate eye-spot. A few of the outer feathers lack the spot and end in a crescent shaped black tip. During the survey the observed photo of Pea fowl is given below.



4.5 DIET AND HABITAT

The peafowl is an omnivore that relies on seeds, leaves and insects and also feed on variety of crops such as groundnut, paddy and fruits in the agriculture areas of buffer zone. The edge of the buffer zone has good amount of vegetation with scrub vegetation and act as a good habitat for Peafowl. Moving from one place to another place was observed frequently in the buffer zone. This may be because of dry vegetation, lack of water and food scarcity.

CONSERVATION PLAN FOR PEA FOWL

4.6 MAJOR THREATS IN THE STUDY AREA

4.6.1 IMPACT WITHIN THE LEASE

In active project area there is no observation of Peafowl because of the project activities, open land and less vegetation. Many activities like direct mining operation involving blasting, drilling, excavation, transportation, dumping etc., clearance of vegetation, road making, lighting are likely to affect the species in the area. Their impact is indicated below to help plan for minimizing them to the extent possible.

4.6.2 PERCEIVED THREAT 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 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.

During the survey, it was observed that there is no major threat in the buffer zone. But in 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.

4.7 CONSERVATION AND IMPROVEMENT OF HABITAT

The following measures are proposed for conservation of the species:

- i. Control of Air Pollution, water pollution, noise and other environmental parameters.
- ii. Habitat improvement
- iii. Garbage Management
- iv. Conservation education

CONSERVATION PLAN FOR PEA FOWL

7.1 CONTROL OF ENVIRONMENTAL POLLUTION

Mining 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 ecofriendly mining in the area.

TRCL has established sound corporate environmental management system along with occupational health and safety management systems in all their working mines and Cement plants.

There are about 8 working mining leases and RR Nagar cement plant of TRCL in the region. All these projects are worked systematically, in an Eco friendly way adhering to all statutory rules, regulations working in buffer zone area of this proposed mine.

Various environmental mitigated measures are and will be implemented in the mining and cement plant areas to prevent any adverse impact on the environment and ecology.

Salient details of the control measures are as follows:

(a) AIR QUALITY

- Usage of sharp Drill bits in good condition
- Drilling with dust extractors and use of water jet for dousing the cuttings
- Deploying Mobile water tankers for fugitive dust suppression in haul roads and dumping sites.
- Providing close cabin for drilling machine
- Well-designed blast by effective stemming and every blast will be properly designed to see that the optimum breakage occurs without generating fines.
- Avoiding blasting during high wind periods where the fine dust is carried out away easily affecting the ambient air quality.
- Adopting controlled blasting techniques and using of Latest method of Non- Electric system using Shock tube detonators & Noiseless Trunk line delays as initiation system
- Proper maintenance of HEMM which avoids excessive noise and vibration
- Acoustic enclosures for operator cabin.
- Imparting sufficient training to operators on safety and environmental parameters
- Proper maintenance of hauling equipment's.
- Proper maintenance of haul road and other roads
- Black topping of road wherever possible. In fact

CONSERVATION PLAN FOR PEA FOWL

- Transportation of Limestone from the mine to the crusher plant and cement plant through dedicated black top road of 36 kms length.
- Ore transportation by tarpaulin covered trucks
- Development of green belt barriers around mine, along the roads, along the cart track, Old dumps, and inactive new dumps within the mine lease areas etc.

(b) WASTE DUMP MANAGEMENT

The following mitigate measures will be implemented in the inactive old dumps and also proposed dump. These remedial steps will be enforced rigorously to control the water environment in the area, by making improvements appropriately.

- Dozing and leveling of inactive present dumps and old dump top.
- Spreading of top soil on the top and slopes of the inactive dumps and old dumps.
- Providing dump tops with inner slopes and through a system of drains and channels, allowing rain water to descent into surrounding drains, so as to minimize the effects of erosion arising out of uncontrolled descent of water.
- Planting native tree species on the dump tops and slopes with grasses and shrubs like *Ageve*, *Aloevera* (sothukatrathi), *Canna indica* (katrathi), *Prosopis* to arrest and prevent erosion.
- Construction of garland drains of suitable size around mine area and external dump with proper gradients to prevent rain water descent into active mine area.
- The material removed from the drain will be dumped towards the waste dumps and an earthen embankment as retaining wall is made to prevent any runoff from the dump.
- The garland drains shall be connected to settling tank to collect surface runoff, mine water and arrest siltation. Four settling ponds with silt trap are suggested.

The details of Garland drain along dumps & settling tanks are given below

Name of dumps & its Location	Name of Garland drain	Size of Garland drain	Settling pond/tank
Old Dump 1 in Block 1	G1	1.3 kmx1mx1.5m	G1 will be connected to G2 & G3 which are connected to Settling tank -1 (ST1) with the size of 80m x 30mx 2.5m in the adjacent existing Sivalarpatti lease area
Old Dump 2 in Block 2	G2	1.24kmx1mx1.5m	
Old Dump 3 in Block 2	G3	0.96kmx1mx1.5m	
Old Dump 4 in Block – 3	G4	2.5 kmX1mX1.5m	G4 & G5 will be connected to

CONSERVATION PLAN FOR PEA FOWL

Name of dumps & its Location	Name of Garland drain	Size of Garland drain	Settling pond/tank
Part of old dump D5 in block 4	G5	1.1 kmX1mX1.5m	ST -2 with the size of 100m x40m x 2.5m located in Block 4 within the lease area
Dump 6 in Block – 5	G6	1.8 km X1mX1.5m	G6 will be connected to the to ST -3 with the size of 60m x25m x 2.5m located in Block 5 within the lease area
Proposed dump - 1 in Block – 5	G7	0.92kmX 1mX 1.5m	G7 will be connected to the existing pond which will be converted in to settlement pond ST -4 with the size of 40m x20m x 2.5m located in Block – 5 within the lease area.

- Check weirs shall also be constructed at different places inside the garland drains to arrest silt flow if any.

(c) NOISE ENVIRONMENT

- Planting rows of native trees along roads, around mine, dump area, in safety barriers and other noise generating centers to act as acoustic barriers.
- Sound proof operator's cabin for equipment's like drills, dumpers, shovel, tippers, etc.
- Proper and regular maintenance of equipment's may lead to less noise generation.
- Providing in-built mechanism for reducing sound emissions.
- Providing earmuffs to workers exposed to higher noise level.
- Conducting regular health check-up of workers including Audiometry test for the workers engaged in noise prone area.
- Displaying the noise level status of operational machinery on the machines to know the extent of noise level and to control the time to which the worker is exposed to higher noise levels.
- Noise levels from blasting will be reduced due to latest method of Non- Electric system using Shock tube detonators & Noiseless Trunk line delays as initiation system

CONSERVATION PLAN FOR PEA FOWL

(d) BLASTING VIBRATION

- a) Optimum design for burden and spacing.
- b) Inclined drilling practice, whenever necessary.
- c) Reducing explosive charge to minimum.
- d) Proper deck charging practices, looking to consolidation and hardness of strata conditions.
- e) Using ordinary electric millie second delay detonators, in combination with Denoting fuse etc. This sequence of blasting reduces vibration to a large extent, thereby minimizing propagation of shock waves.
- f) Using primary rock breaker in top benches wherever possible
Using rock breakers for breaking blasted rock boulders and avoiding secondary Blasting

4.7.2 HABITAT IMPROVEMENT

Towards habitat improvement the following measures are suggested:

(1) Plantation It is therefore necessary to take up plantation of suitable species for providing adequate cover and fodder for the animals.

(2) Conserving or restoring water bodies

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.

CONSERVATION PLAN FOR PEA FOWL

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

(3) Green belt around mine dumps, etc.

- 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.

(4) 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.

In the mine closure stage, the project authorities intends to reclaim about 71.93 Ha of lease area with good green cover along with creation of water body in mine voids which can improve the floral content and attract fauna to the mined out area. Thus the project shall ultimately leave a congenial environment for improvement of floral and faunal population.

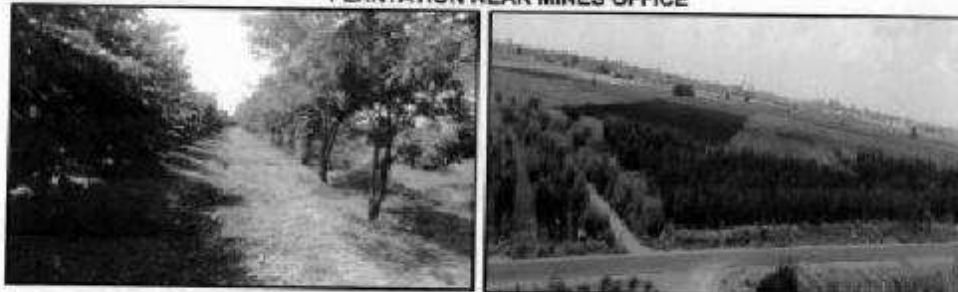
The final selection of species will be done as per advice of local forest department. Thus every effort will be made for regeneration of biodiversity of the mined out area in a scientific way to better the land status.

(5) Green belt present status

Presently about 4.50 ha of land are covered with greenery within the lease area. More than 6,000 trees are planted near Sivalarpatti Mines office area. Trees already planted include *Azadirachta indica*, *Delonix regia*, *Peltophorum pterocarpum*, *Pithecellobium dulce*, *Cassia auriculata* and *Neerium indicum* etc. shown below.

CONSERVATION PLAN FOR PEA FOWL

PLANTATION NEAR MINES OFFICE



Proposed plantation

Green belt is proposed along the mine periphery over an extent of 8.24 hectare during first five year period. While the species chosen for green belt are fast growing with good canopy and dense leaf density, the avenue plantation shall have fruit and flower bearing and some ornamental plants to give good aesthetic look. It is planned to plant Neem, Tamarind, Pungai, Naval, Mango etc. The details are given below

Year	Location	Extent in Ha	No. of Plants
I	Safety Zone & Road Side	1.65	800
II	Safety Zone & Road Side	1.65	800
III	Safety Zone & Road Side	1.65	800
IV	Safety Zone & Road Side	1.65	800
V	Safety Zone & Road Side	1.64	750
TOTAL		8.24	3950

Besides the mine periphery, waste dump and inactive old dumps will be stabilized with vegetation/plantation.

In the ultimate stage, dump plantation will be carried out in 47.09 Ha of Dump area & Topsoil storage area of 1.20 Ha will also be covered with plantation. Besides, Green belt over an area of 23.64 Ha will be carried out along mine periphery, virgin area, safety area left from cart track, EB lines and along the mine hauling roads. Thus, about 71.93 Ha covered under Green Belt/ Dump Plantation in the total lease area of 129.72 Ha in post operational period.

The plantation of native tree species like Mangifera indica, Ficus bengalensis, Odinawodiar, Syzygium cumuni, Azadirachta indica and Tamarindus indica will help to improve the vegetation cover. The restoration of degraded scrub forest and afforestation program will improve the habitat of Peafowl. The Tentative timeline for afforestation operations is given below.

CONSERVATION PLAN FOR PEA FOWL

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

Apart from the lease areas, plantation can also be developed in the nearby lands owned by the company and other vacant land identified by the forest department.

**** These plantations will be established only for improving the habitat of Peafowl, commercial felling's will not be carried out, in case of natural damage of trees, it will be re planted to maintain the canopy cover.**

b) Conserving or restoring water bodies:

Scarcity of water is main issues 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.

4.7.3 Garbage management

The following measures will be taken to manage the same.

- ❖ 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.
- ❖ **Regular Monitoring of garbage will be carried out to avoid addition of poisonous substances.**

CONSERVATION PLAN FOR PEA FOWL

4.7.4 CONSERVATION EDUCATION

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.

4.8 BUDGET

The proposed combined budget for all the leases of TRCL and its cement plant for conservation plan of Schedule - I Species (Pea fowl) are given below

Budget for Intervention of Schedule - I Species (*Pavocristatus*)

Activity	Rs in Lakhs					Total
	1 st Year 2017-18	2 nd Year 2018-19	3 rd Year 2019-20	4 th Year 2020-21	5 th Year 2021-22	
1.Environmental control measures in the lease area	In built in the respective operating cost of the project					
2. Habitat Improvement	0.75	0.75	0.75	0.75	0.75	3.75
3. Conservation education (Awareness)	0.25	0.25	0.25	0.25	0.25	1.25
Total	1.00	1.00	1.00	1.00	1.00	5.00

- Though the budget forecast is fixed for 5 year it may be reviewed every financial year in consultation with concern Forest officials based on the prevailing inflation rates.
- Cost towards item 1 will be spent directly by the company, whereas for 2 and 3 it will be done in consultation with the concern Forest Department.

4.9 APPROACHES FOR IMPLEMENTATION OF PLAN

This plan will be executed and implemented through the Plant head of RR Nagar cement works & Sr. DGM (Mines). Necessary guidance from forest officials will also be taken. Proactive approach of The Ramco Cements Limited in these aspects will ensure habitat restoration, biodiversity conservation in the region.

CONSERVATION PLAN FOR PEA FOWL

1.10 CONCLUSION

Based on the study, peafowls were encountered in the buffer zone only for feeding and in the core zone there is no suitable habitat for peafowl. Based on this it is very clear that project operations are not affecting the peafowl population, habitat and other activities. But still it is necessary to take some conservation measure like habitat restoration in the buffer zone to ensure the future of Indian peafowl.

The Ramco Cements Limited is very active in related to biodiversity and conservation. The company is working very closely to address conservation issues; in past also they worked in the area of green belt development, habitat restoration and biodiversity assessment for various projects and programs.

This report on Conservation Plan for Peafowl recommends several prevention and mitigation measures as well as habitat improvement programs planned to protect biodiversity in the study area. This plan has covered important aspects such as habitat restoration, biodiversity conservation and conservation measures and eco-development to address social and conservation issues. It also provides financial outlay of its implementation cost. All these measures will be strictly enforced and the conservation of the Peafowl will be ensured.

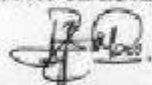
Apart from the pea fowl conservation, RAMCO cements Limited understood the prevailing Act and Rules such as Wild Life (Protection) Act 1972; Environment (Protection) Act 1986, The Water (Prevention and control of pollution) act 1974, The Air (Prevention and control of Pollution) act 1981, Tamil Nadu Forest Act 1882 etc. and will ensure the strict adherence of all such related acts and rules.

The report of adherence of Pea fowl conservation plan shall be submitted annually to The District Forest officer Thoothukudi this report also contain the Forest Range Officer's inspection note.

As the Peafowl and other wild animals spread all over the district the necessary monitory assistance will be extended to Forest department under corporate social responsibility (CSR) funds/ other available funds for the activities such as habitat improvement programme, water conservation & retention works and other awareness programmes.


Forest Range Officer
Pandalgudi.

For RAMCO Cements Limited



Sr.Dy. General Manager(Mines)
The Ramco Cements Limited
Pandalgudi(Pe), Aruppukkottai(Tk)
Virudhunagar(Di)-626 113.

CONSERVATION PLAN FOR PEA FOWL



**Annexure No - 1
National Accreditation Board
for Education and Training**

NABET/EIA/RA030/207
The Chief Executive
Creative Engineers & Consultants
98/4, Bharathwaj Street, East Tambaram,
Chennai – 600059
(Kind Attention: Mr. P. Gini)

Apr 17, 2015

Dear Sir,

Sub: Re-Accreditation

This has reference to your application to QCI-NABET for re-accreditation (RA) as EIA Consultant Organization and the assessment carried for same in your organization from Oct 14-15-16, 2014.

We are pleased to inform you that based on the document and office assessments during RA, the Accreditation Committee has approved renewal of accreditation given to your organization for a period of three years from Oct. 16, 2014 to Oct. 15, 2017 subject to coverage of balance Functional areas and specific response to NCs/Obs./Alerts issued, if applicable (Refer Annexure III) with the following details:

- | | | |
|------------------|---|-------------------------------------------------------------------------------------------------------------------------------------|
| 1. Annexure I | - | Scope of accreditation |
| 2. Annexure II | - | List of experts with approved sectors/ functional areas |
| 3. Annexure III | - | Non-Conformances/ Observations/ Alerts (NCs/ Obs./ Alerts) |
| 4. Annexure IV | - | Observations on Quality Management System (QMS) |
| 5. Annexure V | - | Terms and conditions of accreditation |
| 6. Annexure VI | - | Result of assessment |
| 7. Annexure VII | - | Guidelines for addressing Major Non-Conformances/ Observations/ Alerts |
| 8. Annexure VIII | - | Format to be followed for mentioning the names of the experts involved in EIA reports prepared by Creative Engineers & Consultants. |

Result of RA including Non-Conformances/ Observations/ Alerts (NCs/ Obs./ Alerts) applicable to your organization as per RA are also posted on QCI website vide minutes of the Accreditation Committee meetings dated Nov 26, 2014. You are requested to take necessary action to close the NCs/ Obs. as per guidelines and timeframe mentioned in Annexure VII of this letter.

You are required to make all payments to NABET as applicable, within one month from the date of invoice sent to you. Continuation of this accreditation of your organization is subject to the clearance of all dues by your organization, satisfactory compliance to Annexure III and V.

With best regards,

Yours sincerely,


(Ashish Sharma)
Assistant Director

6th Floor, ITPI Building, 4-A, Ring Road, LP Estate, New Delhi - 110 002, India
Tel : +91-11-2332 3416 / 17 / 18 / 19 / 20 Fax : +91-11-2332 3415
e-mail : nabet@qci.org Website : www.qci.org

CONSERVATION PLAN FOR PEA FOWL



Scheme for Accreditation of EIA Consultant Organizations



Scope of Accreditation

Annexure I

NAME OF THE CONSULTANT ORGANIZATION: Creative Engineers & Consultants
9 B/4, Bharathwaj Street, East Tambaram,
Chennai – 600059

Sl. No.	Sector number		Name of Sector	Category A/B
	As per MoEF Notification	As per NABET Scheme		
1.	1(a) (i)	1	Mining of minerals including Open cast/ Underground mining	A
2.	2(a)	4	Thermal Power Plants	A
3.	2(b)	7	Mineral beneficiation including pelletization	A
4.	3(b)	9	Cement Plants	A
Total = 04 Sectors				
Individual EIA Coordinators approved for different sectors are mentioned in Annexure II				

(Abhay Sharma)
Assistant Director

NABET

Creative Engineers & Consultants, Chennai

Page 2 of 17

CONSERVATION PLAN FOR PEA FOWL



Scheme for Accreditation of EIA Consultant Organizations



Sl. No.	Name	FAs approved in SA/ subsequently		Approval Status after IER		Remarks
		FA (Mining only)	Cat.	Status	Cat.	
3	S. Saravanan	ER	A	Approval Renewed	A	-
4	Sivaranjani	AD	A	Approval Renewed	A	-
Empanelled						
5	R. Nanaji	SE	A	Approval Renewed	A	-
6	BVS Gurunadha Rao	WP	A	Approval Not Continued	-	Approval not continued as FAE WP as there is ambiguity in his employment status
7	R. Radhakrishnan	LU	A	Approval Renewed	A	-
8	M. S. Jayaram	HG	A	Approval Renewed	A	-
		Geo	A	Approval Renewed	A	

*Further to point C (iv) of RA process dated Aug. 23, 2013 uploaded on QCI website, it may be noted that candidates approved (ECs/ FAEs) during earlier assessments will be assessed as per RA norms. However, in case a candidate was not involved in any EIA project during the period after SA and before RA, s/he would be assessed as per Initial Assessment norms.

1.4 Functional Area Experts - assessed as per RA norms*

Sl. No.	Name	Functional Areas			Cat.	Remarks
		Applied	Recommended	Approved		
In-house						
1	P Gini	RH	No	No	-	Not recommended due to lack of EIA related experience in the FA and relevant documentary evidence
2	R Sureswathy	SE	Yes	Yes	A	-
3	K Abhirami	AP	No	No	-	Not recommended for AP, AQ and SHW due to lack of clarity and comprehension on environmental aspects
		AQ	No	No	-	
		WP	Yes	Yes	B	
		SHW	No	No	-	
4	P. Ponmunny	AP	-	-	-	Absent to be assessed
		NV	-	-	-	
5	Sivaranjani	SHW	Yes*	Yes*	B	*MSW only
Empanelled						