

From,

Tmt.R.Chempakadevi

1, Ramasamy Naicker Street,
Vadugarkottai Aruppukottai Town,
Aruppukottai Taluk, Virudhunagar District – 626101.

To

District Environmental Engineer (Virudhunagar District)

Virudhunagar Tamilnadu Pollution Control Board,
No.23, Master Plan Area, Sathur Road,
Collectorate, Virudhunagar - 626 002.

Sub: Submission of Draft EIA/EMP report and Summary for Rough stone and Gravel Quarry of Tmt.R.Chempakadevi over an area of 1.50.0 Ha in Sundakottai Village, Aruppukottai Taluk, Virudhunagar District, Tamil Nadu – Public Hearing_Reg

Ref: ToR granted by SEIAA, Tamil Nadu vide letter SEIAA-TN/F.No.10179/SEAC/ToR 1526/2023 dated 09.08.2023

Sir,

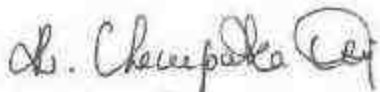
With reference to the above-mentioned subject, I am herewith submitting the Draft EIA/EMP report and Summary of EIA/EMP report in English and Tamil along with CD for Rough stone and Gravel Quarry over an area of 1.50.0 Ha in Sundakottai Village, Aruppukottai Taluk, Virudhunagar District, Tamil Nadu.

As per the terms of reference issued by SEIAA, Tamil Nadu referred to as (1) above, point no: 39 stipulates conduction of public hearing. Hence, I request you to consider conducting a public hearing for my project at the earliest.

Here with enclosed D.D No – dated for public hearing.

Thank you.

Yours Faithfully,



Tmt.R.Chempakadevi

Encl: as above

DRAFT EIA / EMP REPORT

FOR

ROUGH STONE AND GRAVEL QUARRY

Extent	1.50.0 Ha
SF.Nos.	44/1(P), 44/5(P), 44/6, 44/7 and 44/8
Location	Sundakottai Village, Aruppukottai Taluk, Virudhunagar District, Tamil Nadu
Land Type	Patta Land in the name of applicant
Production	Roughstone – 1,50,675m ³ , Gravel – 69,600m ³ for 5 years upto 41m bgl depth
Lease Period	5 years

- Terms of Reference issued by SEIAA, Tamil Nadu vide SEIAA-TN/F.No.10179/SEAC/ToR-1526/2023 dated 09.08.2023.
- Baseline Monitoring Period – Summer Season (March – May 2023)

PROJECT PROPONENT

TMT.R.CHEMPAKADEVI

1, Ramasamy Naicker Street, Vadugarkottai Aruppukottai Town,
Aruppukottai Taluk, Virudhunagar District -626 101

CONSULTANT

CREATIVE ENGINEERS & CONSULTANTS

NABET ACCREDITED CONSULTANCY, NABL ACCREDITED TESTING LAB

9B/4, Bharathwajar Street, East Tambaram, Chennai-600059.

Mobile: 09444133619 Email : cecgiri@yahoo.com.



REVISIONS OF EIA/EMP REPORT

Revision number	Report Status	Date of submission
00/NOV23	Draft EIA /EMP Report	08.11.2023

Environmental Impact Assessment & Environmental Management Plan Report for Rough stone and Gravel Quarry of Tmt.R.Chempakadevi over an area of 1.50.0 Ha in Sundakottai Village, Aruppukottai Taluk, Virudhunagar District, Tamil Nadu was prepared by Creative Engineers & Consultants and authorized for submission by Dr.B.Swamynathan, EIA Coordinator, of Creative Engineers & Consultants on 08.11.2023 after due review by the personnel and consultation with Tmt.R.Chempakadevi. Current Revision number of the EIA/EMP report is 00/NOV/23, signifying as per the revision mentioned in the above table that this is a draft EIA/EMP report.



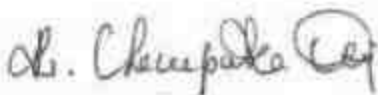
PROJECT PROPONENT DECLARATION

I, Tmt.R.Chempakadevi received ToR under EIA Notification 2006 from SEIAA, Tamil Nadu vide their SEIAA-TN/F.No.10179/SEAC/ToR.1526/2023 dated 09.08.2023 for Rough stone and Gravel Quarry over an area of 1.50.0 Ha in Sundakottai Village, Aruppukottai Taluk, Virudhunagar District, Tamil Nadu.

I have entrusted the EIA study to M/s. Creative Engineers & Consultants (CEC), Chennai who have been accredited by the National Accreditation Board for Education & Training (NABET), Quality Council of India with their accreditation valid upto 23.12.2023.

The Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) have been prepared as per the generic structure proposed in the EIA notification 2006, ToR issued by SEIAA, Tamil Nadu. The prescribed ToR along with compliance is also incorporated in the EIA/EMP Report.

This report is prepared based on the information and data obtained from the Mining Plan and other records and the field study carried out by the consultant. The data given in the EIA/EMP report are factually correct to the best of my knowledge.



Tmt.R.Chempakadevi



CREATIVE ENGINEERS & CONSULTANTS

(NABET ACCREDITED, NABL ACCREDITED TESTING LABORATORY,
DEPARTMENT OF INDUSTRIES AND COMMERCE REGISTERED COMPANY)

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 NABL accredited testing Laboratory, and also NABET accredited Category-A environment consultancy organization for preparing EIA/EMP reports for the sectors Mining of minerals, Thermal power plants, Mineral Beneficiation & Cement plants.

CEC has been accredited by the National Accreditation Board for Education & Training (NABET), Quality Council of India for empanelment of EIA Consultants with accreditation valid upto 23.12.2023.

Tmt.R.Chempakadevi received ToR under EIA Notification 2006 from SEIAA, Tamil Nadu vide their SEIAA-TN/F.No.10179/SEAC/ToR/1526/2023 dated 09.08.2023 for Rough stone and Gravel Quarry over an area of 1.50,0 Ha in Sundakottai Village, Aruppukottai Taluk, Virudhunagar District, Tamil Nadu.

The prescribed TOR is complied with and incorporated in the EIA Report and submitted. This report is based on the information and data obtained from Approved Mining Plan, other records and data from the field study by CEC. The data generated and given in the EIA/EMP Report are factually correct. The sample analyses are carried out through CEC's laboratory.

(P. Giri)

Chief Executive & EIA Coordinator
Creative Engineers & Consultants

Annexure – VII

Declaration by Experts contributing to the EIA Report for

Rough stone and Gravel Quarry of Tmt.R.Chempakadevi over an area of 1.50.0 Ha in Sundakottai Village, Aruppukottai Taluk, Virudhunagar District, Tamil Nadu

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

EIA coordinator:

Name: **B.Swamynathan**





Signature and Date: *B.Swamynathan*

Period of involvement: **January 2023 onwards**

Contact information: **09444133619**

Functional area experts:

S. No.	Functional areas	Name of the expert/s	Involvement (period and task**)	Signature and date
1	AP*	P.Giri	<ul style="list-style-type: none"> • Identification of baseline monitoring stations and study of the monitored data with respect to the applicable standards. • Identification of sources of air pollution comprising dust, gaseous emission due to mining & other activities • Identification of Impacts & suggestion of mitigation measures Period: January 2023 onwards	<i>P.Giri</i>
		B.Swamynathan	<ul style="list-style-type: none"> • Data interpretation of Micro meteorological data for wind rose. • Identification of polluting source and suggestion of suitable mitigation measures. Period: January 2023 onwards	<i>B.Swamynathan</i>

2	WP*	G.Sandhya	<ul style="list-style-type: none"> • Study of the monitored data with respect to the applicable standards. • Identification of Water requirement & Source • Preparation of water balance diagram • Identification of Water polluting sources • Impact of the project on the water quality, both surface and groundwater • Suggestion of Mitigation measures to control water pollution <p>Period: March 2023 onwards</p>	
3	SHW*	P.Giri	<ul style="list-style-type: none"> • Quantification of mineral & waste from mining operation • Waste disposal method evaluation • Providing dump management plan • Providing Surface Runoff Management Structure Requirements. • Identification of Hazardous waste and its details of disposal <p>Period: January 2023 onwards</p>	
4	SE*	R.Baburaj	<ul style="list-style-type: none"> • Identification of villages in the study area and finalization of demographic profile of the villages within the study area. • Preparation of sections relevant to SE functional area in the EIA/EMP report <p>Period: March 2023 onwards</p>	
5	EB*	B.Swamynathan	<ul style="list-style-type: none"> • Perusal of existing data relevant to this project. • Studying the details of flora and fauna, separately for core, buffer zone and forest area based on primary field survey. • Identification of species, Indicating the Schedule of the fauna present in the study area • Assessment of impact on Biological environment and suggestion of mitigative measures • Collecting & providing details of existing and proposed Green belt development /plantation in the core zone <p>Period: January 2023 onwards</p>	
6	HG*	K.Shankar	<ul style="list-style-type: none"> • Study of existing surface drainage arrangements in the core and buffer zone, impact due to mining on these drainage courses and suggestion of mitigative 	

			<p>measures</p> <ul style="list-style-type: none"> • Perusal of site specific ground water table details for the core zone and the study area. • Studied the hydrological aspects of surface and groundwater in study area • Study about impact on the hydrology due to mining operation • Suggesting mitigative measures like RWH for enhancement of ground water level <p>Period: March 2023 onwards</p>	
7	GEO*	K.Shankar	<ul style="list-style-type: none"> • Study of geology of the ML area and the surrounding areas. • Provide details about Mineral composition <p>Period: March 2023 onwards</p>	<i>K.Shankar</i>
8	SC*	B.Swamynathan	<ul style="list-style-type: none"> • Study of soil profile • Assessment of Impact on soil and suggesting plantation scheme. <p>Period: January 2023 onwards</p>	<i>B.Swamynathan</i>
9	AQ*	G.Sandhya	<ul style="list-style-type: none"> • Quantification of emission particulars • Air quality modelling for post project impact on the air quality prediction of the study area. • Analysis of the Isopleth generated • Arriving at the post project concentration at the AAQ monitoring locations • Preparation of meteorological data in suitable form for input into the model • Simulation of model for generation of Isopleth and data interpretation. • Studying the impact on AAQ monitoring locations due to the generated emissions. • Preparation of sections relevant to AQ functional area in the EIA/EMP report. <p>Period: March 2023 onwards</p>	<i>G.Sandhya</i>
10	NV*	P.Giri	<ul style="list-style-type: none"> • Identification of baseline monitoring stations and study of the monitored data with respect to the applicable standards. • Predict the noise level and vibration level due to proposed mining operation based on scientific evaluation. • Suggesting the Mitigation measures to control noise 	<i>P.Giri</i>

			<p>pollution, Suggesting the Mitigation measures to control ground vibration Period: January 2023 onwards</p>	
11	LU	B.Swamynathan	<ul style="list-style-type: none"> • Collection of Remote sensing satellite data to study the land use pattern. • Primary field survey and limited field verification • Preparation of Land use map using Satellite data of the project area separately for the core zone and the buffer zone and providing the land use pattern. <p>Period: January 2023 onwards</p>	<i>B.Swamynathan</i>
12	RH*	K.Shankar	<ul style="list-style-type: none"> • Identified Major risks involved in the project Mitigation measures suggested to avoid risk. • Preparation of onsite and offsite emergency management plan <p>Period: March 2023 onwards</p>	<i>K.Shankar</i>

*One TM against each FAE may be shown

**Please attach additional sheet if required

Declaration by the Head of the accredited consultant organization/ authorized person

I, **P.Giri** hereby confirm that the above mentioned experts prepared the EIA report for Rough stone and Gravel Quarry of Tmt.R.Chempakadevi over an area of 1.50.0 Ha in Sundakottai Village, Aruppukottai Taluk, Virudhunagar District, Tamil Nadu

I also confirm that EIA Coordinator (EC) has gone through the report, and the consultant organization shall be fully accountable for any misleading information. It is certified that no unethical practices, plagiarism involved in carrying out the work and external data / text has not been used without proper acknowledgement while preparing this EIA report.

Signature:



Name: **P.Giri**

Designation: **Chief Executive**

Name of the EIA consultant organization: **Creative Engineers & Consultants, Chennai – 59**

NABET Certificate No. & Issue Date: No- **NABET/EIA/2023/SA 0187 & date 30.01.2023**



CONTENTS

CONTENTS

S.No	PARTICULARS	PG NO.
TERMS OF REFERENCE & ITS COMPLIANCE		
A.	COPY OF TOR	--
B.	COMPLIANCE TO TOR POINTS	T-1
EIA/ EMP REPORT- CHAPTERS		
I	INTRODUCTION	1-1
II	PROJECT DESCRIPTION	2-1
III	DESCRIPTION OF ENVIRONMENT	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 COST BENEFIT ANALYSIS	9-1
X	ENVIRONMENTAL MANAGEMENT PLAN	10-1
XI	SUMMARY & CONCLUSION	11-1
XII	DISCLOSURE OF CONSULTANTS ENGAGED	12-1
ADDITIONAL ENCLOSURES WITH EIA/EMP REPORT CHAPTERS		
	ANNEXURES	A-1

CHAPTER-WISE CONTENTS

CHAPTER 1 INTRODUCTION	1-1
1.1 PURPOSE OF THE REPORT:	1-1
1.2 IDENTIFICATION OF PROJECT & PROJECT PROPONENT:	1-1
1.3 BRIEF DESCRIPTION OF NATURE, SIZE, LOCATION & PROJECT IMPORTANCE	1-2
1.4 SCOPE OF THE STUDY:	1-3
CHAPTER 2 PROJECT DESCRIPTION	2-1
2.1 TYPE OF PROJECT:	2-1
2.2 NEED & JUSTIFICATION FOR THE PROJECT:	2-1
2.3 LOCATION:	2-1
2.4 LAND CLASSIFICATION:	2-10
2.5 GEOLOGY:	2-10
2.6 SIZE AND MAGNITUDE OF THE OPERATION:	2-11
2.6.1 RESERVES:	2-12
2.6.2 MINING METHOD:	2-12
2.7 PROPOSED SCHEDULE FOR APPROVAL AND IMPLEMENTATION:	2-12
2.8 TECHNOLOGY AND PROCESS DESCRIPTION:	2-13
2.9 PROJECT DESCRIPTION:	2-13
2.10 DESCRIPTION OF MITIGATION MEASURES:	2-17
2.11 ASSESSMENT OF NEW & UNTESTED TECHNOLOGY:	2-17
2.12 CONCLUSION:	2-17
CHAPTER 3 DESCRIPTION OF ENVIRONMENT	3-1
3.1 GENERAL:	3-1
3.2 SOCIO-ECONOMIC CONFIGURATIONS OF THE AREA:	3-3
3.3 EXISTING ENVIRONMENTAL QUALITY:	3-9
3.4 LAND ENVIRONMENT - LANDUSE & LAND COVER	3-28
	3-32



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

3.5	BIOLOGICAL ENVIRONMENT:	3-33
3.6	HYDROGEOLOGICAL STUDY:	3-40

CHAPTER 4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION

MEASURES	4-1	
4.1	GENERAL	4-1
4.2	AIR ENVIRONMENT:	4-1
4.3	WATER ENVIRONMENT:	4-8
4.4	NOISE AND VIBRATION:	4-12
4.5	LAND ENVIRONMENT:	4-16
4.6	BIOLOGICAL ENVIRONMENT:	4-17
4.7	SOCIO ECONOMIC ENVIRONMENT:	4-21
4.8	OCCUPATIONAL HEALTH AND SAFETY:	4-22
4.9	LOGISTICAL SYSTEM:	4-24
4.10	WASTE MANAGEMENT:	4-25

CHAPTER 5 ANALYSIS OF ALTERNATIVES **5-1**

5.1	ALTERNATE TECHNOLOGY:	5-1
5.2	ALTERNATE SITE:	5-1

CHAPTER 6 ENVIRONMENTAL MONITORING PROGRAMME **6-1**

6.1	GENERAL	6-1
6.2	MONITORING SCHEDULES FOR VARIOUS PARAMETERS:	6-1
6.3	LEGISLATIVE AND REGULATORY FRAME WORK:	6-2
6.4	ENVIRONMENTAL MONITORING COST:	6-8

CHAPTER 7 ADDITIONAL STUDIES **7-1**

7.1	GENERAL:	7-1
7.2	PUBLIC CONSULTATION:	7-1
7.3	RISK ASSESSMENT:	7-1
7.4	REHABILITATION AND RESETTLEMENT (R & R) PLAN:	7-4
7.5	MINE CLOSURE PLAN:	7-4



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

7.6	CUMULATIVE IMPACT STUDY:	7-5
7.7	PIT SLOPE STABILITY PLAN	7-15
CHAPTER 8 PROJECT BENEFITS		8-1
CHAPTER 9 ENVIRONMENTAL COST BENEFIT ANALYSIS		9-1
CHAPTER 10 ENVIRONMENTAL MANAGEMENT PLAN		10-1
10.1	INTRODUCTION:	10-1
10.2	COMPONENTS OF THE ENVIRONMENTAL MANAGEMENT PLAN:	10-1
10.3	ENVIRONMENTAL POLLUTION CONTROL COST:	10-9
10.4	CONCLUSION:	10-10
CHAPTER 11 SUMMARY & CONCLUSION		11-1
11.1	INTRODUCTION:	11-1
11.2	SALIENT FEATURES OF THE PROJECT:	11-2
11.3	EXISTING ENVIRONMENTAL SCENARIO:	11-4
11.4	ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES:	11-9
11.5	ENVIRONMENTAL MONITORING PROGRAMME:	11-15
11.6	ADDITIONAL STUDIES:	11-16
11.7	CONCLUSION:	11-18
CHAPTER 12 DISCLOSURE OF CONSULTANTS ENGAGED		12-1



LIST OF FIGURES

Figure 2.1: Location Map	2-2
Figure 2.2: Approachability Map	2-3
Figure 2.3: Lease Plan	2-3
Figure 2.4: Satellite Imagery Showing Corner Co-ordinates of the Project Area	2-6
Figure 2.5: Village Map	2-8
Figure 2.6: Details of features within 500m radius	2-9
Figure 2.7: Geological Plan & Cross Section	2-11
Figure 2.8: Process Flow Diagram	2-13
Figure 2.9: Year wise Plan & Cross Section	2-14
Figure 2.10: Conceptual Plan & Cross Section	2-15
Figure 3.1: Study Area Map	3-2
Figure 3.2: Demographic Structure in Buffer Zone	3-5
Figure 3.3: History of Cyclonic Storms	3-10
Figure 3.4: Seismic Zone Map of India	3-11
Figure 3.5: Monthly Average Rainfall	3-13
Figure 3.6: Average Annual Rainfall	3-13
Figure 3.7: Average Wind Rose	3-15
Figure 3.8: Ambient Air Quality Study Stations	3-17
Figure 3.9: Ambient Air Quality Data	3-18
Figure 3.10: Location of Water Sampling Stations	3-20
Figure 3.11: Location of Noise Sampling Stations	3-23
Figure 3.12: Noise Level Data	3-24
Figure 3.13: Location of Soil Sampling Stations	3-26
Figure 3.14 : Landsat 8 Satellite Data of the Study Area	3-29
Figure 3.15: Map Showing Land Use Categories around 10km Buffer	3-30
Figure 3.16: Landuse within the Buffer Zone Area	3-32
Figure 3.17: Flora species in the Buffer Zone	3-38

**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

Figure 3.18: Fauna Diversity in the Buffer Zone	3-40
Figure 3.19: Drainage Map	3-41
Figure 3.20: Geology Map	3-42
Figure 3.21: Geomorphology Map	3-43
Figure 3.22: Lithology Map	3-44
Figure 3.23: Soil Map	3-45
Figure 3.24: Pre-Monsoon Water Level	3-46
Figure 3.25: Post Monsoon Water Level	3-46
Figure 4.1: Isoleth of GLC Prediction for PM ₁₀	4-5
Figure 4.2: Isoleth of GLC Prediction for PM _{2.5}	4-6
Figure 4.3: Water Balance Diagram	4-8
Figure 4.4: Surface Runoff Management Structures	4-9
Figure 4.5: Mine Closure Plan	4-21
Figure 7.1: Vicinity Map	7-6
Figure 7.2: Cumulative Isoleth of GLC Prediction for PM ₁₀	7-9
Figure 7.3: Cumulative Isoleth of GLC Prediction for PM _{2.5}	7-10
Figure 7.4: Post Mining Land Use	7-14
Figure 10.1: Organization Chart	10-3
Figure 12.1: Disclosure of consultants engaged	12-1



LIST OF TABLES

Table 1.1 Identification of project	1-1
Table 1.2: Identification of Project Proponent	1-2
Table 1.3: Statutory Approvals	1-2
Table 1.4: Brief Description of Nature of project	1-2
Table 1.5: Location of the project	1-3
Table 2.1: Mine site description	2-1
Table 2.2: Features within 500m radius	2-10
Table 2.3: Survey Number wise Area Breakup	2-10
Table 2.4: Geological succession of the area	2-10
Table 2.5: Geological and Mineable Reserves	2-12
Table 2.6: Details of Equipments	2-12
Table 2.7: Proposed Schedule of Implementation	2-13
Table 2.8: Production Schedule During Plan Period	2-13
Table 2.9: Ultimate Pit Dimensions	2-15
Table 2.10: Land Use	2-16
Table 2.11: Project Requirements	2-16
Table 3.1: Type of Baseline Data	3-1
Table 3.2: Environmental Setting of the Study Area	3-3
Table 3.3: Social, Economic and Demographic Profile of the Study Area	3-4
Table 3.4: Primary Schools in the Buffer Zone Rural Villages	3-7
Table 3.5: Education Facility Availability	3-7
Table 3.6: Healthcare Amenities Availability	3-7
Table 3.7: Infrastructure Facilities	3-8
Table 3.8: Average Annual Rainfall Data (2011-2020)	3-12
Table 3.9: Meteorological Data	3-14
Table 3.10: Air Quality Monitoring	3-16
Table 3.11: Air Quality Monitoring Locations	3-16

**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

Table 3.12: Ambient Air Quality Data	3-18
Table 3.13: Water Quality Monitoring	3-19
Table 3.14: Summary of Water Quality Data	3-21
Table 3.15: Noise Level Monitoring	3-22
Table 3.16: Ambient Noise Level in dB (A)	3-24
Table 3.17: Soil Quality Monitoring	3-25
Table 3.18: Soil Quality Data	3-27
Table 3.19: RS satellite image used for the present study	3-28
Table 3.20: Major Landuse Units of the Study Area	3-29
Table 3.21: Area Estimation of Landuse Categories in Buffer Zone	3-30
Table 3.22: Land Use Pattern of the Study Area Falling Within 10 Km Area in (Ha)	3-32
Table 3.23: List of Floristic Species in the Core Zone	3-35
Table 3.24: List of Floristic Species in the Buffer Zone	3-36
Table 3.25: List of Fauna in the Buffer Zone	3-39
Table 3.26: General Trend of Depth to Water Level for Aruppukottai Block	3-45
Table 4.1: Impact and Mitigation Measures – Air Environment	4-2
Table 4.2: Emission Sources	4-3
Table 4.3: Emission Factors	4-4
Table 4.4: Emission Rate	4-4
Table 4.5: Peak Incremental Concentration	4-4
Table 4.6: Concentrations Of PM ₁₀ after Project Implementation	4-7
Table 4.7: Concentrations Of PM _{2.5} after Project Implementation	4-7
Table 4.8: Ground Water Resources Estimation– Aruppukottai Taluk (Ha-m)	4-10
Table 4.9: Main Sources of Noise	4-12
Table 4.10: Impact of Noise Levels	4-12
Table 4.11: Post Project Noise Levels	4-13
Table 4.12: Permissible Peak Particle Velocity (PPV) In Mining Areas	4-15
Table 4.13: Land Use Table	4-16
Table 4.14: Land Use During Post Operational Period	4-16



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

Table 4.15: Impact on Biological Environment	4-17
Table 4.16: Proposed Plantation	4-20
Table 4.17: CER Cost	4-22
Table 4.18: Details of Transportation	4-24
Table 6.1: Environmental Monitoring Schedule	6-2
Table 6.2: Environmental Standards	6-2
Table 6.3: National Ambient Air Quality Standards	6-3
Table 6.4: IS – 10500 :2012 Standards	6-5
Table 6.5: Noise Level Standards	6-7
Table 6.6: Permissible Noise For Industrial Workers As Laid Down By CPCB	6-7
Table 6.7: Permissible Peak Particle Velocity (PPV) In Mining Areas	6-8
Table 7.1: Details of quarries within 500m radius	7-5
Table 7.2: Salient details of the proposed quarries	7-7
Table 7.3: Cumulative Peak Incremental Concentration	7-8
Table 7.4: Concentrations of PM ₁₀ after Project Implementation	7-11
Table 7.5: Concentrations of PM _{2.5} after Project Implementation	7-11
Table 7.6: Post project noise levels	7-12
Table 7.7: Cumulative number of trips	7-13
Table 10.1: Environmental Control Cost	10-9
Table 11.1: Site Details	11-2
Table 11.2: Environment Setting of The Study Area	11-2
Table 11.3: Technical Description	11-3
Table 11.4: Details of Buffer Zone	11-4
Table 11.5: Social, Economic And Demographic Profile of the Study Area	11-5
Table 11.6: Baseline Data	11-6
Table 11.7: Land Use in 10Km Buffer Zone	11-7
Table 11.8: Mitigation Measures – Air Environment	11-9
Table 11.9: Mitigation Measures – Water Pollution	11-11



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

LIST OF ANNEXURES

ANNEXURE NO.	PARTICULARS	PAGE NO.
1	Precise area communication Letter	A-1
2	Mine plan approval letter	A-4
3	Details of other quarries in 500m radius	A-8
4	Population Breakup and Literacy Levels in the Buffer Zone	A-11
5	Occupational Structure in the Buffer Zone	A-13
6	Educational Facilities in the Buffer Zone	A-15
7	Medical Facilities in the Buffer Zone	A-17
8	Infrastructural Facilities in the Buffer Zone	A-19
9	Ambient Air Quality Data	A-21
10	Water Quality Data	A-26
11	Village-wise Land Use Pattern in the Buffer Zone	A-28
12	VAO Letter	A-30





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National Accreditation Board for Education and Training



Certificate of Accreditation

Creative Engineers and Consultants,

9B/4, Bharathwajar street, East Tambaram, Chennai, Tamil Nadu

The organization is accredited as **Category-A** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, Version 3: for preparing EIA-EMP reports in the following Sectors –

S. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals including opencast/ underground mining	1	1 (a) (i)	A
2	Thermal power plants	4	1 (d)	A
3	Mineral beneficiation	7	2 (b)	A
4	Cement Plants	9	3 (b)	A

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in SAAC minutes dated Oct 4, 2022 posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENV/23/2653 dated January 30, 2023. The accreditation needs to be renewed before the expiry date by Creative Engineers and Consultants, following due process of assessment.

Sr. Director, NABET
Dated: January 30, 2023

Certificate No.
NABET/EIA/2023/SA 0187

Valid up to
December 23, 2023

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



TERMS OF REFERENCE & ITS COMPLIANCE



THIRU.DEEPAK S.BILGI, I.F.S.,
MEMBER SECRETARY

STATE LEVEL ENVIRONMENT IMPACT
ASSESSMENT AUTHORITY – TAMIL NADU

3rd Floor, Panagal Maaligai,
No.1, Jeenis Road, Saidapet,
Chennai-15.

Phone No. 044-24359973

Fax No. 044-24359975

TERMS OF REFERENCE (ToR)

Lr No. SEIAA-TN/F.No.10179/SEAC/ToR-1526/2023 dated:09.08.2023

To

Tmt. R. Chempakadevi
W/o. T.R.Varadarajan
1, Ramasamy Naicker Street,
Vadugarkottai Aruppukottai Town,
Aruppukottai Taluk,
Virudhunagar District – 626 101

Sir/Madam,

Sub: SEIAA-TN – Terms of Reference with public hearing for the Proposed Rough Stone & Gravel Quarry lease over an extent of 1.50.0Ha S.F.No.44/1(P), 44/5(P), 44/6, 44/7 & 44/8, Sundakottai Village, Aruppukottai Taluk, Virudhunagar District by Tmt.R.Chempaka Devi – under project category – “B1” and Schedule S.No.1 (a) – ToR issued along with Public Hearing - preparation of EIA report – Regarding.

- Ref: 1. Online Application No SIA/TN/MIN/434553/2023, dt:30/06/2023
2. Your application for Terms of Reference dated: 05.07.2023
3. Minutes of the 395th SEAC Meeting held on 27.07.2023
4. Minutes of the 646th SEIAA meeting held on 09.08.2023

Kindly refer to your proposal submitted to the State Level Impact Assessment Authority for Terms of Reference.

The proponent, Tmt.R.Chempaka Devi has submitted application for Terms of Reference (ToR) with public Hearing, in Form-I, Pre- Feasibility report for the Proposed Rough Stone & Gravel Quarry

MEMBER SECRETARY
SEIAA-TN

lease over an extent of 1.50.0Ha S.F.No.44/1(P), 44/5(P), 44/6, 44/7 & 44/8, Sundakottai Village, Aruppukottai Taluk, Virudhunagar District, Tamil Nadu.

Remarks by SEAC:

Proposed Rough Stone & Gravel Quarry lease over an extent of 1.50.0Ha S.F.No.44/1(P), 44/5(P), 44/6, 44/7 & 44/8, Sundakottai Village, Aruppukottai Taluk, Virudhunagar District by Tmt. R. Chempaka Devi- For Terms of Reference.

(SIA/TN/MIN/434553/2023, dt:30/06/2023)

The proposal was placed in the 395th SEAC Meeting held on 27.07.2023. The details of the minutes are available in the website (parivesh. nic. in).

The SEAC noted the following:

1. The project proponent, Tmt. R. Chempaka Devi has applied for Terms of Reference for the proposed Rough Stone & Gravel Quarry lease over an extent of 1.50.0Ha S.F.No.44/1(P), 44/5(P), 44/6, 44/7 & 44/8, Sundakottai Village, Aruppukottai Taluk, Virudhunagar District, Tamil Nadu.
2. The project/activity is covered under Category "B1" of Item 1(a) "Mining of Minerals Projects" of the Schedule to the EIA Notification, 2006.
3. As per the precise area communication the lease period is for 5 years. The mining plan is for 5 Years. The Mineable reserve /production for 5 Years shall not to exceed 150675m³ of Rough Stone & 69000m³ of Gravel and the ultimate depth of 41m BGL.

Based on the presentation and details furnished by the project proponent, SEAC decided to grant Terms of Reference (TOR) with Public Hearing subject to the following TORs, in addition to the standard terms of reference for EIA study for non-coal mining projects and details issued by the MOEF & CC and Annexure, to be included in EIA/EMP Report:

1. The PP shall discuss the plan for the management of the composite quantity of Top soil & Gravel to be excavated during the earlier part of the quarrying.
2. The Proponent shall furnish the mitigation measures for the 'Kanmai' situated nearby due to the proposed quarrying operations.
3. The Proponent shall provide a Controlled Blast design & Vibration Prediction for the structures located within 500 m from the lease boundary and any other sensitive structures.
4. The proponent shall furnish a revised EMP budget for entire life of proposed mining.


MEMBER SECRETARY
SEIAA-TN

Annexure

1. In the case of existing/operating mines, a letter obtained from the concerned AD (Mines) shall be submitted and it shall include the following:
 - (i) Original pit dimension
 - (ii) Quantity achieved Vs EC Approved Quantity
 - (iii) Balance Quantity as per Mineable Reserve calculated.
 - (iv) Mined out Depth as on date Vs EC Permitted depth
 - (v) Details of illegal/illicit mining
 - (vi) Violation in the quarry during the past working.
 - (vii) Quantity of material mined out outside the mine lease area
 - (viii) Condition of Safety zone/benches
 - (ix) Revised/Modified Mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m.
2. Details of habitations around the proposed mining area and latest VAO certificate regarding the location of habitations within 300m radius from the periphery of the site.
3. The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m (v) 500m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc with indicating the owner of the building, nature of construction, age of the building, number of residents, their profession and income, etc.
4. The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc are located within 1 km of the proposed quarry.
5. The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.
6. The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site.
7. In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining Plan, the Project Proponent (PP) shall the PP shall carry out the scientific studies to assess the slope stability of the working benches to be constructed and existing quarry wall, by involving any one of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining & Fuel Research /


MEMBER SECRETARY
SEIAA-TN

Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. The PP shall submit a copy of the aforesaid report indicating the stability status of the quarry wall and possible mitigation measures during the time of appraisal for obtaining the EC.

8. However, in case of the fresh/virgin quarries, the Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30 m below ground level.
9. The PP shall furnish the affidavit stating that the blasting operation in the proposed quarry is carried out by the statutory competent person as per the MMR 1961 such as blaster, mining mate, mine foreman, II/I Class mines manager appointed by the proponent.
10. The PP shall present a conceptual design for carrying out only controlled blasting operation involving line drilling and muffle blasting in the proposed quarry such that the blast-induced ground vibrations are controlled as well as no fly rock travel beyond 30 m from the blast site.
11. The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences.
12. If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines,
13. What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?
14. Quantity of minerals mined out.
 - Highest production achieved in any one year
 - Detail of approved depth of mining.
 - Actual depth of the mining achieved earlier.
 - Name of the person already mined in that leases area.
 - If EC and CTO already obtained, the copy of the same shall be submitted.
 - Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.
15. All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the



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SEIAA-TN

- mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).
16. The PP shall carry out Drone video survey covering the cluster, green belt, fencing, etc.,
 17. The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.
 18. The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment, and the remedial measures for the same.
 19. The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of the Mines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.
 20. The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of groundwater pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds, etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided.
 21. The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.
 22. The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.
 23. Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.


MEMBER SECRETARY
SEIAA-TN



24. Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
25. Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided.
26. Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.
27. Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.
28. Impact on local transport infrastructure due to the Project should be indicated.
29. A tree survey study shall be carried out (nos., name of the species, age, diameter etc..) both within the mining lease applied area & 300m buffer zone and its management during mining activity.
30. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.
31. As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible.
32. The purpose of Green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the appendix-I in consultation with the DFO, State Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.
33. Taller/one year old Saplings raised in appropriate size of bags, preferably ecofriendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with


MEMBER SECRETARY
SEIAA-TN

- regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner
34. A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.
 35. A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.
 36. Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.
 37. Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.
 38. The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.
 39. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
 40. Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.
 41. If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCB.
 42. The PP shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine.
 43. Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms


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SEIAA-TN

of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.

Appendix -I
List of Native Trees Suggested for Planting

No	Scientific Name	Tamil Name	Tamil Name
1	<i>Aegle marmelos</i>	Vilvam	வில்வம்
2	<i>Adenanthera pavonina</i>	Manjadi	மஞ்சளம், ஆனைக்கடுன்றிமணி
3	<i>Albizia lebbek</i>	Vaagai	வாகை
4	<i>Albizia amara</i>	Usil	உசில்
5	<i>Bauhinia purpurea</i>	Mantharai	மந்தாரை
6	<i>Bauhinia racemosa</i>	Aathi	ஆத்தி
7	<i>Bauhinia tomentosa</i>	Iruvathi	இருவாத்தி
8	<i>Buchanania axillaris</i>	Kattuma	காட்டுமா
9	<i>Borassus flabellifer</i>	Panai	பனை
10	<i>Butea monosperma</i>	Murukkamaram	முருக்கமரம்
11	<i>Bobax caiba</i>	Ilavu, Sevvilavu	இலவு
12	<i>Calophyllum inophyllum</i>	Punnai	புன்னை
13	<i>Cassia fistula</i>	Sarakondrai	சர்க்கொன்றை
14	<i>Cassia roxburghii</i>	Sengondrai	செங்கொன்றை
15	<i>Chloroxylon sweetenia</i>	Purasamaram	புரசு மரம்
16	<i>Cochlospermum religiosum</i>	Kongu, Manjallavu	கோங்கு, மஞ்சள் இலவு
17	<i>Cordia dichotoma</i>	Naruvuli	நருவூளி
18	<i>Creteva adansonii</i>	Mavalingum	மாவிளங்கம்
19	<i>Dillenia indica</i>	Uva, Uzha	உசா
20	<i>Dillenia pentagyna</i>	SiruUva, Sitruzha	சிறு உசா
21	<i>Diospyro sebenium</i>	Karungali	கருங்காலி
22	<i>Diospyro schloroxylon</i>	Vaganai	வாகனை
23	<i>Ficus amplissima</i>	Kalltchi	கல் இச்சி
24	<i>Hibiscus tiliacou</i>	Astrupoovarasu	ஆற்றுப்பலகை
25	<i>Hardwickia binata</i>	Aacha	ஆச்சா
26	<i>Holoptelia integrifolia</i>	Aayili	ஆயா மரம், ஆயிலி
27	<i>Lannea coromandelica</i>	Odhiam	ஓதியம்
28	<i>Lagerstroemia speciosa</i>	Poo Marudhu	பூ மருது
29	<i>Lepisanthus tetraphylla</i>	Neikottaimaram	நெய் கொட்டை மரம்
30	<i>Limonia acidissima</i>	Vila maram	வில்லா மரம்
31	<i>Litsea glutinos</i>	Pisinpattai	பிசிப்பட்டை
32	<i>Madhuca longifolia</i>	Illuppai	இலுப்பை
33	<i>Manilkara hexandra</i>	UlakkaiPaalai	உலக்கை பாலை
34	<i>Mimusops elengi</i>	Magizhamaram	மகிழ்மரம்
35	<i>Mitragyna parvifolia</i>	Kadambu	கடம்பு
36	<i>Morinda pubescens</i>	Nuna	நுணா
37	<i>Morinda citrifolia</i>	Vellai Nuna	வெள்ளை நுணா
38	<i>Phoenix sylvestre</i>	Eachai	எச்சமரம்
39	<i>Pongamia pinnat</i>	Pungam	புங்கம்

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SEIAA-TN

40	<i>Premna mollissima</i>	Munnai	முள்ளை
41	<i>Premna serratifolia</i>	Narumunnai	நறு முள்ளை
42	<i>Premna tomentosa</i>	Malaipoovarasu	மலை பூவரசு
43	<i>Prosopis cinerea</i>	Vavri maram	வள்ளி மரம்
44	<i>Pterocarpus marsupium</i>	Vengai	வேங்கை
45	<i>Pterospermum canescens</i>	Vennangu, Tada	வேண்ணாங்கு
46	<i>Pterospermum xylocarpum</i>	Polavu	புலவு
47	<i>Putranjiva roxburghii</i>	Karipala	கரிபாலா
48	<i>Salvadora persica</i>	Ugaa Maram	ஊகா மரம்
49	<i>Sapindus emarginatus</i>	Manipungan, Soapukai	மணிபுங்கன் சோபுகாய்
50	<i>Saraca asoca</i>	Asoca	அசோகா
51	<i>Streblus asper</i>	Piray maram	பிராய் மரம்
52	<i>Strychnos nuxvomica</i>	Yetti	எட்டி
53	<i>Strychnos potatorum</i>	Therthang Kottai	தேத்தான் கோட்டை
54	<i>Syzygium cumini</i>	Naval	நாவல்
55	<i>Terminalia belleric</i>	Thandri	தாண்டி
56	<i>Terminalia arjuna</i>	Ven marudhu	வேண் மருது
57	<i>Toona ciliata</i>	Sandhana vembu	சந்தன வேம்பு
58	<i>Thespesia populnea</i>	Puvarasu	பூவரசு
59	<i>Walsuratrifoliata</i>	valsura	வால்சுரா
60	<i>Wrightia tinctoria</i>	Veppalai	வேப்பாளை
61	<i>Pithecolobium dulce</i>	Kodukkapuli	கொடுக்காபுளி

Appendix -II

Display Board

(Size 6' x5' with Blue Background and White Letters)

சரங்கம்

கரங்கத்தில் குவாரி செயல்பாடுகளுக்கான சுற்றுச்சூழல் அழிவிட சிறுசைட நிகழ்வுகளுக்கு உட்பட்டு வழங்கப்படும் இலாபம், நேரமிடப்பட்டு, சுற்றுச்சூழல் அழிவிட ஏதே வளர் செயல்படுத்தக்கூடா உண்டு

பயன்படுத்தும் வகைகள் செயல்படுத்தக்கான ஏற்கத்தக்க திட்டம்	குவாரியின் எல்லைகளில் சுற்றி வேலி அமைக்க வேண்டும். கரங்கப்பகுதியின் ஆழம் தளமாடத்திற்குட்பட்ட நிலத்தில் வேலி கட்ட வேண்டும். சுற்றுச்சூழல் மாசு ஏற்படாதவாறு ஏற்க பயிற்சனை மேற்கொள்ள வேண்டும்.
நடப்பட்டுள்ள பராமரிக்கப்பட வேண்டிய மரங்கள் எண்ணிக்கை	வாகைகள் செல்லும் பாதையில் மாசு ஏற்படாத அளவிற்கு தண்ணீர் முறையாக தண்ணீர் வாரிகளின் மூலமாக அளவப்போது தெளிக்க வேண்டும். இனத்தின் அளவைகள் குளி மாசுபாட்டையும் குறைப்பதற்காக குவாரியின் எல்லைகளில் சுற்றி அடத்தியான பசுவை பத்தியை ஏற்படுத்த வேண்டும்.
ஏற்கத்தில் மொது எல்லைப்போலது திட்டமிடவகை ஏற்படாதவாறும் மற்றும் ஏற்க மாசுபாடுகளும் பராமரிக்க வேண்டிய உட்கட்டமைப்புகளை உட்கட்ட வேண்டிய செயல்படுத்தப்பட வேண்டும்.	இனத்தின் இடத்தில் ஏற்படும் இனத்தின் அளவு 85 செ.மீ.யில் (85) அளவிற்கு மேல் ஏற்படாதவாறு தகுந்த கட்டுப்பாடுகளை மேற்கொள்ள வேண்டும்.
ஏற்க கட்டிட வகைகள் மாசு கீழ் ஏற்கத்தில் உண் பயிற்சனைகளுக்கு தகுந்த பராமரிப்பு ஏற்கவகை வழங்குவதற்கு கருத்துரைகள் கரிப்பாறு வகைகளை செயல்படுத்த வேண்டும்.	மரங்கள் அல்லது பராமரிப்பு வகைகளை வகைகள் செல்லும் எல்லைகளில் தெளியும் நன்றி பராமரிக்க வேண்டும். ஏற்கப்பயிற்சனைகள் அளவில் உண் விவசாயப் பயிற்சனை மற்றும் திறிற்சனைகள் பாதிக்கப்படக் கூடாது.
நிர்ணயிக்கப்பட்ட கட்டிடம் இடப்பாறு உட்கட்டி செயல்பட வகையில் வேல்கை திட்டம் தகுதியான தெளியும் வகைகளைக் வேண்டும்.	ஏற்கத்தில் இடத்தில் கரிப் செயல்பாடுகளை எடுத்துச் செயல்படும் மரங்கள் மகசூல்க்கு ஏற்ற சிறுபத்தியைகள் ஏற்படுத்தாதவாறு பராமரிப்போடும் மற்றும் சுற்றுச்சூழல் பாதிக்காத வகைகள் வகைகளைக் குபக்க வேண்டும்.
ஏற்கப்பயிற்சனை முபக்கப்பட்ட வகை ஏற்க மூட்டல் திட்டத்தில் உண்வாறு ஏற்கத்தியான மூட்ட வேண்டும்.	ஏற்க நடவடிக்கைகளை முபத்தியைக் கரங்கப் பகுதி மற்றும் ஏற்க நடவடிக்கைகளைக் குபட்டி ஏற்படக்கூடிய வேல்கை பகுதியையும் மற்றும் இடப்பாறு செயல்பாடுகளில் விவகைகள் கரிப்பாற்றின் வாரிகளில் ஏற்க வகையில் பராமரிப்பதையும் உருவாக்க வேண்டும்.
முபக்கப்பட்ட நிகழ்வுகளைக் கரிப் பரிப்பாறு (http://www.seiaa.org) கரிப்பிற்சனைப்பாற்றும் பரிப்பாறு வகை மற்றும் சுற்றுச்சூழல் சுற்றிப் பரிப்பாறுக் செயல்பாடுகள் உண் சுற்றுச்சூழல் மற்றும் வகை அளவகத்தின் முபக்கியைக் குபட்டி அளவகம்: 044 - 26222325 (அல்லது) கரிப்பாறு மாசு கட்டுப்பாடு வாரிகளின் மாவட்ட சுற்றுச்சூழல் செயல்பாறை அழகை	

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SEIAA-TN

Remarks by SEIAA:

The proposal was placed in the 646th Authority meeting held on 09.08.2023. The authority noted that this proposal was placed for appraisal in 395th SEAC meeting held on 27.07.2023. After detailed discussions, the Authority accepts the recommendation of SEAC and decided to grant Terms of Reference (ToR) along with Public Hearing under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC & normal conditions and conditions in Annexure 'B' of this minutes.

Annexure 'B'**Cluster Management Committee**

1. Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry.
2. The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc..
3. The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines.
4. Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network.
5. The committee shall deliberate on risk management plan pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan.
6. The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be given in detail.
7. The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner.
8. The committee shall furnish the Emergency Management plan within the cluster.
9. The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public.
10. The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety.
11. The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.


MEMBER SECRETARY
SEIAA-TN

Impact study of mining

12. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following
- Soil health & soil biological, physical land chemical features.
 - Climate change leading to Droughts, Floods etc.
 - Pollution leading to release of Greenhouse gases (GHG), rise in Temperature, & Livelihood of the local people.
 - Possibilities of water contamination and impact on aquatic ecosystem health.
 - Agriculture, Forestry & Traditional practices.
 - Hydrothermal/Geothermal effect due to destruction in the Environment.
 - Bio-geochemical processes and its foot prints including environmental stress.
 - Sediment geochemistry in the surface streams.

Agriculture & Agro-Biodiversity

13. Impact on surrounding agricultural fields around the proposed mining Area.
14. Impact on soil flora & vegetation around the project site.
15. Details of type of vegetations including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetations all along the boundary of the proposed mining area shall committed mentioned in EMP.
16. The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem.
17. Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.
18. The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.

Forests

19. The project proponent shall detailed study on impact of mining on Reserve forests free ranging wildlife.
20. The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.


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SEIAA-TN



21. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.
22. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.

Water Environment

23. Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.
24. Erosion Control measures.
25. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas.
26. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.
27. The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.
28. The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts.
29. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.
30. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.

Energy

31. The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished.

Climate Change

32. The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities.


MEMBER SECRETARY
SEIAA-TN


33. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.

Mine Closure Plan

34. Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued.

EMP

35. Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued.
36. The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan.

Risk Assessment

37. To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.

Disaster Management Plan

38. To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued.

Others

39. The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc.
40. As per the MoEF& CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management Plan.
41. The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.


MEMBER SECRETARY
SEIAA-TN

A. STANDARD TERMS OF REFERENCE


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


MEMBER SECRETARY
SEIAA-TN

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


MEMBER SECRETARY
SEIAA-TN

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


MEMBER SECRETARY
SEIAA-TN

- in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.
- 23) Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of Vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.
 - 24) The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.
 - 25) Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.
 - 26) Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.
 - 27) Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.
 - 28) Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.
 - 29) Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.
 - 30) Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.
 - 31) A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly


MEMBER SECRETARY
SEIAA-TN



indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.

- 32) Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.
- 33) Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.
- 34) Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.
- 35) Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.
- 36) Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.
- 37) Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.
- 38) Detailed Environmental Management Plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.
- 39) Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.
- 40) Details of litigation pending against the project, if any, with direction /order passed by any


MEMBER SECRETARY
SEIAA-TN

Court of Law against the Project should be given.

- 41) The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.
- 42) A Disaster management Plan shall be prepared and included in the EIA/EMP Report.
- 43) Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.
- 44) Besides the above, the below mentioned general points are also to be followed:-
 - a) Executive Summary of the EIA/EMP Report
 - b) All documents to be properly referenced with index and continuous page numbering.
 - c) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.
 - d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.
 - e) Where the documents provided are in a language other than English, an English translation should be provided.
 - f) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.
 - g) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.
 - h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the ToR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.
 - i) As per the circular no. J-11011/618/2010-IA.II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the Environment Clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.
 - j) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii)


MEMBER SECRETARY
SEIAA-TN



sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.

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

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

1. Project name and location (Village, District, State, Industrial Estate (if applicable).
2. Process description in brief, specifically indicating the gaseous emission, liquid effluent and solid and hazardous wastes.
3. Measures for mitigating the impact on the environment and mode of discharge or disposal.
4. Capital cost of the project, estimated time of completion.
5. The proponent shall furnish the contour map of the water table detailing the number of wells located around the site and impacts on the wells due to mining activity.
6. A detailed study of the lithology of the mining lease area shall be furnished.
7. Details of village map, "A" register and FMB sketch shall be furnished.
8. Detailed mining closure plan for the proposed project approved by the Geology of Mining department shall be submitted along with EIA report.
9. Obtain a letter /certificate from the Assistant Director of Geology and Mining standing that there is no other Minerals/resources like sand in the quarrying area within the approved depth of mining and below depth of mining and the same shall be furnished in the EIA report.
10. EIA report should strictly follow the Environmental Impact Assessment Guidance Manual for Mining of Minerals published February 2010.
11. Detail plan on rehabilitation and reclamation carried out for the stabilization and restoration of the mined areas.
12. The EIA study report shall include the surrounding mining activity, if any.
13. Modeling study for Air, Water and noise shall be carried out in this field and incremental increase in the above study shall be substantiated with mitigation measures.
14. A study on the geological resources available shall be carried out and reported.
15. A specific study on agriculture & livelihood shall be carried out and reported.
16. Impact of soil erosion, soil physical chemical and biological property changes may be assumed.
17. Site selected for the project - Nature of land - Agricultural (single/double crop), barren, Govt./ private land, status of its acquisition, nearby (in 2-3 km.) water body, population, within 10km other industries, forest, eco-sensitive zones, accessibility, (note - in case of industrial estate this information may not be necessary)


MEMBER SECRETARY
SEIAA-TN


18. Baseline environmental data - air quality, surface and ground water quality, soil characteristic, flora and fauna, socio-economic condition of the nearby population
19. Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk.
20. Likely impact of the project on air, water, land, flora-fauna and nearby population
21. Emergency preparedness plan in case of natural or in plant emergencies
22. Issues raised during public hearing (if applicable) and response given
23. CER plan with proposed expenditure.
24. Occupational Health Measures
25. Post project monitoring plan
26. The project proponent shall carry out detailed hydro geological study through intuitions/NABET Accredited agencies.
27. A detailed report on the green belt development already undertaken is to be furnished and also submit the proposal for green belt activities.
28. The proponent shall propose the suitable control measure to control the fugitive emissions during the operations of the mines.
29. A specific study should include impact on flora & fauna, disturbance to migratory pattern of animals.
30. Reserve funds should be earmarked for proper closure plan.
31. A detailed plan on plastic waste management shall be furnished. Further, the proponent should strictly comply with, Tamil Nadu Government Order (Ms) No.84 Environment and forests (EC.2) Department dated 25.06.2018 regarding ban on one time use and throw away plastics irrespective of thickness with effect from 01.01.2019 under Environment (Protection) Act, 1986. In this connection, the project proponent has to furnish the action plan.

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

- a. A note confirming compliance of the TOR, with cross referencing of the relevant sections / pages of the EIA report should be provided.
- b. All documents may be properly referenced with index, page numbers and continuous page numbering.
- c. Where data are presented in the report especially in tables, the period in which the data were collected and the sources should be indicated.


MEMBER SECRETARY
SEIAA-TN



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


MEMBER SECRETARY
SEIAA-TN

Copy to:

1. The Additional Chief Secretary to Government, Environment & Forests Department, Govt. of Tamil Nadu, Fort St. George, Chennai - 9
2. The Chairman, Central Pollution Control Board, Parivesh Bhavan, CBD Cum-Office Complex, East Arjun Nagar, New Delhi 110032.
3. The Member Secretary, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai-600 032.
4. The APCCF (C), Regional Office, MoEF & CC (SZ), 34, HEPC Building, 1st& 2nd Floor, Cathedral Garden Road, Nungambakkam, Chennai -34.

5. Monitoring Cell, IA Division, Ministry of Environment, Forests & CC, Paryavaran Bhavan, CGO Complex, New Delhi 110003
6. The District Collector, Virudhunagar District.
7. Stock File.



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU**

TOR COMPLIANCE

S.No	ToR Points	Reply	Pg. No
A. ToR in Addition to Standard ToR			
1	The PP shall discuss the plan for the management of the composite quantity of Top soil & Gravel to be excavated during the earlier part of the quarrying.	There is no waste generation anticipated in this quarry operation since the entire excavated material will be utilized. The top overburden in the form of Gravel and weathered rock will be loaded into tipper and marketed to needy customers on payment of necessary Fees to Government.	2-15
2	The Proponent shall furnish the mitigation measures for the 'Kanmai' situated nearby due to the proposed quarrying operations.	There is a seasonal drainage channel located on the southern side of the lease for which 10m safety distance has been left. Earthen bund will be formed within the lease area. There is no proposal to discharge any effluent into this waterbody. No major impact is envisaged on the nearby water bodies due to project operations	4-10
3	The Proponent shall provide a Controlled Blast design & Vibration Prediction for the structures located within 500 m from the lease boundary and any other sensitive structures.	Controlled blasting will be adopted in this project and details of the same has been provided in Section 4.4.2, Chapter-IV	4-14
4	The proponent shall furnish a revised EMP budget for entire life of proposed mining.	Will be submitted	--
B. Annexures			
1	In the case of existing/operating mines, a letter obtained from the concerned AD (Mines) shall be submitted and it shall include the following: a) Original pit dimension b) Quantity achieved Vs EC Approved Quantity c) Balance Quantity as per Mineable Reserve calculated. d) Mined out Depth as on date Vs EC Permitted depth e) Details of illegal/illicit mining	This is a proposed quarry. As such no mining activities have been carried out in this lease area.	2-13



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU**

	<p>f) Violation in the quarry during the past working.</p> <p>g) Quantity of material mined out outside the mine lease area</p> <p>h) Condition of Safety zone/benches</p> <p>i) Revised/Modified Mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m.</p>		
2	<p>Details of habitations around the proposed mining area and latest VAO certificate regarding the location of habitations within 300m radius from the periphery of the site.</p>	<p>Enclosed as Annexure-12 of the EIA/EMP Report.</p>	A-30
3	<p>The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m (v) 500m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc with indicating the owner of the building, nature of construction, age of the building, number of residents, their profession and income, etc.</p>	<p>Details of the features produced within 500m radius are provided in Figure 2.6, Chapter-II.</p>	2-9
4	<p>The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc are located within 1 km of the proposed quarry.</p>	<p>Hydrogeological Study is detailed under Section 3.6, Chapter-III.</p>	3-40
5	<p>The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.</p>	<p>A detailed study of flora and fauna composition in the core and buffer zone of the project has been made through primary field surveys. The details are furnished in para 3.5, Chapter III.</p>	3-36
6	<p>The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site.</p>	<p>Will be obtained</p>	-



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU**

7	In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining Plan, the Project Proponent (PP) shall the PP shall carry out the scientific studies to assess the slope stability of the working benches to be constructed and existing quarry wall, by involving any one of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. The PP shall submit a copy of the aforesaid report indicating the stability status of the quarry wall and possible mitigation measures during the time of appraisal for obtaining the EC.	This is a proposed quarry. As such no mining activities have been carried out in this lease area.	2-13
8	However, in case of the fresh/virgin quarries, the Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30 m below ground level.	Pit slope stability plan has been provided under Section 7.7, Chapter-VII	7-15
9	The PP shall furnish the affidavit stating that the blasting operation in the proposed quarry is carried out by the statutory competent person as per the MMR 1961 such as blaster, mining mate, mine foreman, III/ Class mines manager appointed by the proponent.	Will be submitted	--
10	The PP shall present a conceptual design for carrying out only controlled blasting operation involving line drilling and muffle blasting in the proposed quarry such that the blast-induced ground vibrations are controlled as well as no fly rock travel beyond 30 m from the blast site.	Controlled blasting will be adopted in this project and details of the same has been provided in Section 4.4.2, Chapter-IV	4-14
11	The EIA Coordinators shall obtain and	Agreed	--



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU**

	furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences.		
12	If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines,	This is a proposed quarry. As such no mining activities have been carried out in this lease area.	2-13
13	What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?	Replied above in point no.12	--
14	Quantity of minerals mined out. •Highest production achieved in any one year •Detail of approved depth of mining. •Actual depth of the mining achieved earlier. •Name of the person already mined in that leases area. •If EC and CTO already obtained, the copy of the same shall be submitted. •Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.	Replied above in point no.12	--
15	All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	<ul style="list-style-type: none"> • Satellite imagery with corner coordinates of the project area is provided in Figure 2.4, Chapter-II. • Toposheet of the lease area and buffer zone is provided in Figure 3.1, Chapter-III. • Geology, Geomorphology, Lithology map of the lease area and buffer zone is provided in Figure 3.17, 3.18 and 3.19, Chapter-III. 	2-6 3-2 3-42
16	The PP shall carry out Drone video survey covering the cluster, Green belt, fencing etc.,	Agreed	--
17	The proponent shall furnish photographs of adequate fencing, green	Site photographs have been provided in Chapter-II.	2-7



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU**

	belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.		
18	The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment and the remedial measures for the same.	<ul style="list-style-type: none"> • The details of geological and mineable reserves are provided in Table 2.5, Chapter-II. • The production schedule during the plan period is provided in Table 2.8, Chapter-II. • The working methodology is detailed under Section 2.8, Chapter-II. • Anticipated impacts of mining operations on surrounding environment is provided under Chapter-IV. 	2-12 2-13 4-1
19	The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of Mines Act 1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.	The organization chart is provided as Figure No.10.1, Chapter-X.	10-1
20	The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of groundwater pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds, etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard	Hydrogeological Study is detailed under Section 3.6, Chapter-III.	3-40



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU**

	may be provided.		
21	The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.	The baseline data on micro-meteorology, ambient air quality, Water quality, noise level, soil and flora & fauna are collected during Summer Season (March – May 2023) and detailed in Section 3.3 to 3.5 of Chapter-III. The details of Traffic Study is provided under Section 4.9, Chapter-IV.	3-9
22	The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of air pollution, water pollution, & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.	<ul style="list-style-type: none"> The details of the quarries located within the 500m radius of the project is given vide Annexure-3. A cumulative impact study has been carried out and furnished in Para 7.3, Chapter-VII. Environmental Management Plan is provided under Chapter-X. 	7-5 7-7 10-1
23	Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.	Water requirement for this project is 10 KLD. The required water will be procured initially from outside agencies. Later Rain water harvested in the mine sump can also be used.	2-16
24	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	<ul style="list-style-type: none"> The land use of the study area was studied to demarcate various LULC categories and its details are provided under section 3.4, Chapter-III. The land use pattern at present and at the end of the quarrying period has been provided under section 4.5.1, Chapter-IV. The post mining land use has been provided in Table No. 4.14. The post mining land use plan showing afforestation and water body is shown in Figure No- 4.5. 	3-31 4-16
25	Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be	There is no waste generation anticipated in this quarry. As such there are no OB dumps involved.	--



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU**

	provided.		
26	Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.	Not applicable	--
27	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	<ul style="list-style-type: none"> The rain water falling in the quarry will be harvested in the sump at the lowest level of the quarry. This sump will act as a settling pond to prevent solids escaping along with discharge, before outlet etc. Towards surface runoff management, a garland drain of length 450m will be constructed around the quarry and will be connected to a settling pond with silt traps. The supernatant clear water from the settling pond will be flow to the downstream users. The surface runoff management structures diagram is given in Figure No 4.4, Chapter-IV. Details of rainwater harvesting are provided under Section 4.3.4.2, Chapter-IV. 	4-9
28	Impact on local transport infrastructure due to the Project should be indicated.	<ul style="list-style-type: none"> From this proposed quarry the entire output will be transported to the crusher units for producing stone aggregates of different sizes or construction of roads, bridges, buildings and other buyers etc. About 6 trips per hour of transport is envisaged. The existing road can easily absorb this traffic due to this project. The details of various mitigative measures towards logistical system is elaborated under Section 4.9, Chapter-IV. 	4-24
29	A tree survey study shall be carried out	An ecological survey of the study area	3-34



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU**

	(nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity.	was conducted with reference to listing of species and assessment of the existing baseline ecological conditions. Details are provided under section 3.5.1, Chapter-III.	
30	A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.	Details of Mine Closure Plan is provided under section 7.6, Chapter-VII.	7.4
31	As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible.	An ecological survey of the study area was conducted with reference to listing of species and assessment of the existing baseline ecological conditions. Details are provided under section 3.5.1, Chapter-III.	3-34
32	The purpose of green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the appendix-I in consultation with the DFO, State Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.	Agreed	--
33	Taller/one year old Saplings raised in appropriate size of bags, preferably eco-friendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner	Agreed	--



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU**

34	A Disaster management Plan shall be prepared and included in the, EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	The disaster management plan has been provided under section 7.4.1, Chapter-VII.	7-3
35	A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	Various risks likely to arise due to mining activities are detailed under section 7.3, Chapter-VII.	7-2
36	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	Details of occupational health and safety aspects are given under the subsections of Para 4.8, Chapter-IV.	4-22
37	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	<ul style="list-style-type: none"> ▪ Details of the socio-economic survey conducted in the buffer zone has been provided in Para 3.2.4, Chapter-III. ▪ Public health facilities will be further aimed to be developed through CER activities wherein periodic health checkups, medical camps for the locals will be conducted. 	3-8
38	The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	Nearby villages were visited for conducting study to know about socio-economic conditions, including aspirations and requirements of the people for a better living and collected relevant data. The details are provided under section 3.2.4, Chapter-III.	3-8
39	Details of litigation pending against the	There is no litigation pending against the	--



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU**

	project, if any, with direction /order passed by any Court of Law against the Project should be given.	project.	
40	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	<ul style="list-style-type: none"> • The Roughstone and Gravel Quarry will benefit this region in the fields of employment opportunities, improved per capita income for local people, improved social welfare facilities in respect of education, health, infrastructural etc. • Direct employment to about 28 people and indirect employment to scores of people. • By means of carrying out the socio-economic development activities, local community development is expected. Towards the same, the proponent has planned to allocate Rs.5 Lakhs for various activities under CER for all the three projects together. From the CER activities allocated for various social welfare activities, the villages near the lease area will be benefited. 	8-1
41	If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional office, Chennai (or) the concerned DEE/TNPCB.	This is a proposed quarry. As such no mining activities have been carried out in this lease area.	2-13
42	The PP shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine.	Will be submitted	--
43	Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment	Agreed	--



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU**

	(Protection) Act, 1986.		
Annexure-B			
Cluster Management Committee			
1	Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry.	Details of the cluster management committee is provided under Section 10.2.2, Chapter-X.	10.4
2	The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, water sprinkling, tree plantation, blasting etc.,	Details of the cluster management committee is provided under Section 10.2.2, Chapter-X.	10.4
3	The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines.	Details of the cluster management committee is provided under Section 10.2.2, Chapter-X.	10.4
4	Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network.	Details of the cluster management committee is provided under Section 10.2.2, Chapter-X.	10.4
5	The committee shall deliberate on risk management plan pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan.	Details of the cluster management committee is provided under Section 10.2.2, Chapter-X.	10.4
6	The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be	Details of the cluster management committee is provided under Section 10.2.2, Chapter-X.	10.4



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU**

	given in detail.		
7	The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner.	Details of the cluster management committee is provided under Section 10.2.2, Chapter-X.	10-4
8	The committee shall furnish the Emergency Management plan within the cluster.	Details of the cluster management committee is provided under Section 10.2.2, Chapter-X.	10-4
9	The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public.	Details of the cluster management committee is provided under Section 10.2.2, Chapter-X.	10-4
10	The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety.	Details of the cluster management committee is provided under Section 10.2.2, Chapter-X.	10-4
11	The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.	Details of the cluster management committee is provided under Section 10.2.2, Chapter-X.	10-4
Impact Study of Mining			
12	<p>Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following:</p> <p>a) Soil health & soil biological, physical land chemical features</p> <p>b) Climate change leading to Droughts, Floods etc.</p> <p>c) Pollution leading to release of Greenhouse gases (GHG), rise in Temperature, & Livelihood of the local people.</p> <p>d) Possibilities of water contamination</p>	<ul style="list-style-type: none"> • As such the production from this lease is very low to cause any appreciable impact. • No adverse impact on the surrounding environment is envisaged since the number of equipments to be used to achieve this small production is very less and the magnitude of operation is of very small level. • Besides, as is it a mining project, no adverse generation of heat is envisaged. • Certified vehicles with low carbon emissions will only be used. These equipments will be properly and regularly maintained. Besides, regular vehicular emission tests will be done for the transport vehicles to ensure minimal impact due to carbon emissions. To further mediate the carbon emissions, a 	4-18



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU**

	<p>and impact on aquatic ecosystem health</p> <p>e) Agriculture, Forestry & Traditional practices.</p> <p>f) Hydrothermal/Geothermal effect due to destruction in the Environment.</p> <p>g) Bio-geochemical processes and its foot prints including environmental stress</p> <p>h) Sediment geochemistry in the surface streams</p>	<p>good greenbelt and plantation plan has been planned wherein 750 number of plants will be planted in and around the lease area.</p> <ul style="list-style-type: none"> • Geologically the area in and around the lease area contains charnokite type rock formation containing mostly fallow land. As such there no major vegetation or agricultural activities are observed. • There are no Protected or Eco-Sensitive Zone or forest land nearby wherein it can have an impact. • It will be ensured that mining will be carried out adhering to all the statutory rules and regulations and maintaining the environmental quality within the prescribed standards by effective implementation of various mitigative measures. • These mitigative measures will be continued for the entire lease period ensuring no impact on the environment. • As such release of Greenhouse gases (GHG), rise in temperature, affecting livelihood of the local people, loss of Agriculture, Forestry and Traditional Practices is not envisaged. Such a limited scope will not induce any climatic change leading to droughts, floods etc. 	
Agriculture & Agro-Biodiversity			
13	Impact on surrounding agricultural fields around the proposed mining Area.	Most of the study area remain uncultivated and only in patches of land away from the lease area, agricultural activities are carried during monsoon rainfall. Due to poor quality of the soil, inconsistent rainfall, water scarcity, high agricultural labor cost, manpower shortage and less yield are reason for very little agricultural activity in this region.	4-19
14	Impact on soil flora & vegetation around the project site.	The impact of mining on biological environment is provided under Table 4.15, Chapter-IV.	4-17
15	Details of type of vegetations including no. of trees & shrubs within the	The details of flora in the core zone is provided in Table 3.24, Chapter-III. There	3-34



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU**

	proposed mining area and. If so, transplantation of such vegetations all along the boundary of the proposed mining area shall committed mentioned in EMP.	is no major clearance of vegetation or transplantation involved.	
16	The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem.	An ecological survey of the study area was conducted with reference to listing of species and assessment of the existing baseline ecological conditions. Details are provided under Section 3.5.1, Chapter-III.	3-34
17	Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.	The post mining land use has been provided in Table No. 4.13. The post mining land use plan showing afforestation and water body is shown in Figure No- 4.5.	4-20
18	The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.	Most of the study area remain uncultivated and only in patches of land away from the lease area, agricultural activities are carried during monsoon rainfall. Due to poor quality of the soil, Inconsistent rainfall, water scarcity, high agricultural labor cost, manpower shortage and less yield are reason for very little agricultural activity in this region.	4-19
Forests			
19	The project proponent shall detailed study on impact of mining on Reserve forests free ranging wildlife.	There are no reserve forest in the proximity of the lease area	3-2
20	The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.	An ecological survey of the study area was conducted with reference to listing of species and assessment of the existing baseline ecological conditions. Details are provided under Section 3.5.1, Chapter-III.	3-34
21	The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.	Replied in point 20. Above.	--
22	The Environmental Impact Assessment	There are no national parks or corridors in	3-2



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU**

	should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.	the 10k- radius. There are no reserve forest in the proximity of the lease area	
Water Environment			
23	Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.	Details of hydrogeological scenario of this project is provided under section 3.6, Chapter-III.	3-41
24	Erosion Control Measures	<ul style="list-style-type: none"> Since the entire material from the quarry face will be directly dispatched to the consumers, there will not be any stockpiles. There are no waste dumps in this quarry. As such there will not be any wash out due to stock pile or waste dumps. Towards surface runoff management, a garland drain of length 450m will be constructed around the quarry and will be connected to a settling pond with silt traps. Earthen bund provide of length 150m in southern side for safety barrier. The supernatant clear water from the settling pond will be flow to the downstream users. 	4-9
25	Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas.	There is a seasonal drainage channel located on the southern side of the lease for which 10m safety distance has been left. Earthen bund will be formed within the lease area. There is no proposal to discharge any effluent into this waterbody. No major impact is envisaged on the nearby water bodies due to project	4-10



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU**

		operations	
26	The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.	There is no major perennial waterbody in close proximity of the lease area. Gundar River lies at a distance of 6Km from the lease area.	3-3
27	The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.	The post mining land use has been provided in Table No. 4.14. The post mining land use plan showing afforestation and water body is shown in Figure No- 4.4.	4-16
28	The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts.	An ecological survey of the study area was conducted with reference to listing of species and assessment of the existing baseline ecological conditions. Details are provided under Section 3.5.1, Chapter-III.	3-34
29	The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.	Soil samples were collected in 4 locations in the core and buffer zone to analyse the physiochemical characteristics of the soil in the area. The soil quality data is provided in Table No.3.18, Chapter-III.	3-28
30	The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.	<ul style="list-style-type: none"> • The nearest major water bodies is provided in Table No.3.1, Chapter-III. • There is a seasonal drainage channel located on the southern side of the lease for which 10m safety distance has been left. Earthen bund will be formed within the lease area. There is no proposal to discharge any effluent into this waterbody. No major impact is envisaged on the nearby water bodies due to project operations. • The mining area consists of hard compact rock, hence no major water seepage within the mine is expected from the periphery. The ground water table in this area is below the ultimate pit level. Hence, ground water intersection is not envisaged and ground water will not be affected appreciably due to the quarrying operation. 	3-2



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU**

Energy			
31	The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilize the Energy shall be furnished.	The dust control measures are listed under Table 4.1, Water pollution control measures under Section 4.3.2, and noise pollution control measures under Section 4.4.1.2, Chapter-IV. Besides, energy consumption in this project will be optimum and as per requirement.	4-2
Climate Change			
32	The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities.	Certified vehicles with low carbon emissions will only be used. These equipments will be properly and regularly maintained. Besides, regular vehicular emission tests will be done for the transport vehicles to ensure minimal impact due to carbon emissions. To further mediate the carbon emissions, a good greenbelt and plantation plan has been planned wherein 750 number of plants will be planted in and around the lease area.	4-3
33	The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.	Replied in point no.32	--
Mine Closure Plan			
34	Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued.	Details of Mine Closure Plan is provided under section 7.6, Chapter-VII	7-4
EMP			
35	Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued.	Detailed environmental management plan is provided under Chapter-X.	10-1
36	The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan.	Detailed environmental management plan is provided under Chapter-X.	10-1
Risk Assessment			



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU**

37	To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.	Various risks likely to arise due to mining activities are detailed under Section 7.3, Chapter-VII.	7-2
Disaster Management Plan			
38	To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued.	The disaster management plan has been provided under Section 7.4.1, Chapter-VII.	7-3
Others			
39	The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odal, vaari, canal, channel, river, lake pond, tank etc.	Enclosed as Annexure-12 of the EIA/EMP Report.	A-30
40	As per the MoEF& cc office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management plan.	Agreed	--
41	The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.	Single use plastics/ use and throwaway plastics will be banned in the site as directed by the Tamil Nadu Government vide GO(Ms)No.84 regarding ban on use of plastic products. The employees will be encouraged to use compostable material or reusable material.	4-25



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU**

Standard ToR		
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.	<p>This is a proposed quarry. As such no mining activities have been carried out in this lease area.</p> <p align="right">2-13</p>
2	A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given	<p>Precise Area Communication letter received from the Assistant Director, Dep. of Geology & Mining, Virudhunagar vide KV1/878/2018-Minerals dated 26.08.2022. (Annexure-1)</p> <p align="right">A-1</p>
3	All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.	<p>The production capacity, quantity of waste, its management and mining technology in mine plan and EIA, etc., are compatible with one another.</p> <p align="right">--</p>
4	All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/ toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	<ul style="list-style-type: none"> • Satellite imagery with corner coordinates of the project area is provided in Figure 2.4, Chapter-II. • Toposheet of the lease area and buffer zone is provided in Figure 3.1, Chapter-III. • Geology, Geomorphology, Lithology map of the lease area and buffer zone is provided in Figure 3.17, 3.18 and 3.19, Chapter-III. <p align="right">2-6 3-2 3-42</p>
5	Information should be provided in Survey of India Topo sheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.	<p>Replied in Standard ToR point no.4</p> <p align="right">--</p>



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU**

6	Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.	Not Applicable	--
7	It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.	<ul style="list-style-type: none"> • The proponent will frame a well-planned environmental policy. Its details are provided under Section 10.2.1, Chapter-X. • The Mines Manager 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 programme, social development schemes, etc in the mine. The organizational chart for the same has been provided in Figure No.10.1, Chapter-X. 	10-1
8	Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.	Various risks likely to arise due to mining activities are detailed under section 7.4, Chapter-VII. This being an opencast mine, subsidence is not applicable. The impact due to ground vibrations due to blasting is given in para 4.3.2, Chapter-IV.	7-13
9	The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.	The study area chosen for collecting existing environmental status covers 10 km radial distance from the project periphery (Figure No - 3.1). Data given in the report is for the life of the mine.	3-2



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU**

10	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	<ul style="list-style-type: none"> The land use of the study area was studied to demarcate various LULC categories and its details are provided under section 3.4, Chapter-III. The land use pattern at present and at the end of the quarrying period has been provided under section 4.5.1, Chapter-IV. The post mining land use has been provided in Table No. 4.14. The post mining land use plan showing afforestation and water body is shown in Figure No- 4.5. 	3-30
11	Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.	There is no waste generation anticipated in this quarry operation since the entire excavated material will be utilized. Hence, there is no external overburden dump involved. Besides, there is no proposal for overburden dump outside the lease area.	2-15
12	Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.	Not Applicable	--
13	Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of Net Present Value (NPV) and Compensatory Afforestation (CA) should be indicated. A copy of the	Not Applicable	--



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU**

	forestry clearance should also be furnished.		
14	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.	Not Applicable	--
15	The vegetation in the RF / PF areas in the study area, with necessary details, should be given.	There are no reserve forest in the proximity of the lease area	3-2
16	A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.	The mining lease area and the 10 km buffer zone from the periphery of the core zone is devoid of declared ecologically sensitive features like national parks, biospheres, sanctuaries, etc.	4-17
17	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.	Replied in Standard ToR point No.16	--
18	A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone	A detailed study of flora and fauna composition in the core and buffer zone of the project has been made through primary field surveys. The details are furnished in para 3.5, Chapter III.	3-34



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU**

	should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.		
19	Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.	Not Applicable	--
20	Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).	Not Applicable	--
21	R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the	The mining activities will be carried out within the mine lease areas only. The entire mine lease areas are patta land in proponent's possession. Hence, the question of R& R does not arise.	7-4



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU**

	<p>study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shilling of village(s) including their R&R and socio-economic aspects should be discussed in the Report.</p>		
22	<p>One season (non-monsoon) (i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season) primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality,; noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the predominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the predominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.</p>	<ul style="list-style-type: none"> • The baseline data on micro-meteorology, ambient air quality, Water quality, noise level, soil and flora & fauna are collected during Summer Season (March 2023 to May 2023) and detailed in para 3.3 to 3.5 of Chapter-III • Monitoring stations were selected taking into account, wind direction and location of sensitive receptors. • Free silica composition in PM10 sample has been done and the values are found to be Below Detectable Limit (DL 0.05mg/m³) which is well within the prescribed limit of 5mg/m³. 	3-11
23	<p>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</p>	<ul style="list-style-type: none"> • Air quality modeling details are furnished in para 4.2.2 and its continuous sub paras in Chapter-IV of EIA report. • The impact on air quality due to the proposed project is estimated using AERMOD. View Gaussian Plume Air 	4-1



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU**

	<p>the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.</p>	<p>Dispersion Model developed by Lakes Environmental Software which is based on steady state Gaussian plume dispersion</p> <ul style="list-style-type: none"> • The model simulations are done for the air pollutant arising from the mining operations, namely, PM10, PM2.5. Ground Level Concentration (GLC) have been computed using hourly meteorological data. • The Isopleths of PM10, PM2.5 concentrations for with control measures scenario have also been drawn and these are given in Figure No.4.1 and 4.2 • It can be seen that the resultant added concentrations with baseline figures even at worst scenario, show that the values of ambient air quality with respect to PM10 are within the statutory limits in each case. 	
24	<p>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.</p>	<p>The total water requirement for this project will be 10.0 KLD comprising 1.0 KLD for drinking water and domestic use, 8.0 KLD for dust suppression and 1.0 KLD for greenbelt. The water will be sourced initially from outside agencies. Later the rainwater collected in the mine pit sump will be used for this purpose. The water balance diagram for the same is shown in Figure No 4.3, Chapter-IV.</p>	4-8
25	<p>Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.</p>	<p>Not Applicable</p>	--
26	<p>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.</p>	<ul style="list-style-type: none"> • The rain water falling in the quarry will be harvested in the sump at the lowest level of the quarry. This sump will act as a settling pond to prevent solids escaping along with discharge, before outlet etc. 	4-9



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU**

		<ul style="list-style-type: none"> • Towards surface runoff management, garland drain will be constructed around the quarry and will be connected to a settling pond with silt traps. The supernatant clear water from the settling pond will be flow to the downstream users. The surface runoff management structures diagram is given in Figure No 4.4, Chapter-IV. • The methods for reducing water consumption and rainwater harvesting is provided in section 4.3.4, Chapter-IV. 	
27	Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.	<ul style="list-style-type: none"> • There is no proposal to discharge any effluent into this water body. • The ultimate pit depth of mining is 41m. The ground water table in this area is below this level. Hence, ground water intersection in not envisaged and ground water will not be affected appreciably due to the quarrying operation. 	4-10
28	Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.	<p>The occurrence of groundwater mainly in the porous soil are weathered layers, very negligible amount of groundwater percolated through the poorly fractured layer, after that there is no existence of groundwater. Since the mining area consists of hard compact rock, no major water seepage within the mine is expected from the periphery.</p> <p>The ultimate pit depth of mining is 41m. The ground water table in this area is below this level. Hence, ground water intersection in not envisaged and ground water will not be affected appreciably due to the quarrying operation.</p> <p>Details of hydro geological study are given in Para 3.6, Chapter – III.</p>	4-10
29	Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion	Replied above in Standard ToR point No.27.	--



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU**

	proposed, if any, and the impact of the same on the hydrology should be brought out.		
30	Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.	The ultimate pit depth of mining is 41m. The ground water table in this area is below this level.	4-10
31	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phasc-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.	In the lease area, safety barrier 7.5m around the periphery is left. About 750 trees will be planted in and around the lease area. The details of proposed plantation is provided under Table 4.16, Chapter-IV.	4-3
32	Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study	From this proposed quarry the entire output will be transported to the crusher units for producing stone aggregates of different sizes or construction of roads, bridges, buildings and other buyers etc. Details of the traffic study is provided under section 4.9, Chapter-IV.	4-23



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU**

	as per Indian Road Congress Guidelines.		
33	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.	This is a proposed project. Site services like mine office, first aid room, rest shelters, toilets etc. will be provided as semi-permanent structures.	2-19
34	Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.	The post mining land use has been provided in Table No. 4.13. The post mining land use plan showing afforestation and water body is shown in Figure No- 4.4.	4-16
35	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed	Details of occupational health and safety aspects are given under the subsections of Para 4.8, Chapter-IV.	4-22
36	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations	<ul style="list-style-type: none"> • Details of the socio economic survey conducted in the buffer zone has been provided in Para 3.2.4, Chapter-III. • Public health facilities will be further aimed to be developed through CER activities wherein periodic health checkups, medical camps for the locals will be conducted. 	3-9
37	Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	Nearby villages were visited for conducting study to know about socio-economic conditions, including aspirations and requirements of the people for a better living and collected relevant data. The details are provided under section 3.2.4, Chapter-III.	3-9
38	Detailed environmental management plan (EMP) to mitigate the environmental	Detailed environmental management plan	10-1



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU**

	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.	is provided in Chapter-X.	
39	Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.	<ul style="list-style-type: none"> This draft EIA/EMP report will be exposed to public consultation as per mandatory procedures through the District Collector and State Pollution Control Board officials after giving 30 days advance notice in two local newspapers about the scheduled date and time for conduct of the public hearing procedures. The opinions, concerns and objections of stakeholders will be recorded during the public hearing. All the public queries and the replies to the query by the project proponent and officials concerned will be recorded and incorporated in the EIA/EMP report for approval by SEIAA, Tamil Nadu. 	7-1
40	Details of litigation pending against the project, if any, with direction /order paced by any Court of Law against the Project should be given.	There is no litigation pending against the project.	--
41	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.	<p>The cost of the project is Rs. 50,14,760/- (Including operational + Fixed Asset + EMP cost).</p> <p>The capital and recurring cost of the project is provided under Table No.10.1, Chapter-X.</p>	2-17
42	A Disaster management Plan shall be prepared and included in the EIA/EMP Report.	The disaster management plan has been provided under section 7.4.1, Chapter-VII.	7-14
43	Benefits of the Project if the Project is implemented should be spelt out. The	The Rough Stone and Gravel Quarry will benefit this region in the fields of	8-1



DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE, ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU

	<p>benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.</p>	<p>employment opportunities, improved per capita income for local people, improved social welfare facilities in respect of education, health, infrastructural etc.</p> <p>Direct employment to 20 people and indirect employment to scores of people.</p> <p>By means of carrying out the socio economic development activities, local community development is expected. Towards the same, the proponent has planned to allocate Rs. 5 Lakhs for various activities under CER. From the CER activities allocated for various social welfare activities, the villages near the lease area will be benefited.</p>
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CHAPTER - I

INTRODUCTION

CHAPTER 1

INTRODUCTION

1.1 PURPOSE OF THE REPORT:

Tmt.R.Chempakadevi proposes to operate a **Rough Stone and Gravel Quarry** over an area of 1.50.0 Ha in Sundakottai Village, Aruppukottai Taluk, Virudhunagar District, Tamil Nadu and has initiated action towards obtaining environmental clearance.

It is proposed to mine 1,50,675 m³ of Roughstone and 69,600 m³ of Gravel upto a total depth of 41m bgl during the lease period of 5 years. This is a fresh lease and as such no mining operations have been carried out here so far.

Although the individual lease area of this project is less than 5 Ha, the other existing and proposed quarries within the 500m radius cluster along with this subject project works out to >5 Ha. Hence, this proposal is considered under Category – B1 and as per MoEF & CC notification necessitates preparation of EIA/EMP report and public hearing.

This EIA/EMP report is prepared based on standard and additional Terms of Reference issued by SEIAA, Tamil Nadu vide letter no. SEIAA-TN/F.No.10179/SEAC/ToR-1526/2023 dated 09.08.2023 and is in conformance of the generic structure prescribed by MOEF&CC in their notification of September 2006 and the approved mining plan.

1.2 IDENTIFICATION OF PROJECT & PROJECT PROPONENT:

Table 1.1 Identification of project

1	Project Name	Rough Stone and Gravel Quarry of Tmt.R.Chempakadevi
2	Extent	1.50.0 Ha
3	Production	Roughstone - 1,50,675m ³ , Gravel - 69,600m ³
4	Ultimate Depth	41m bgl
5	Land Classification	Patta land owned by the applicant
6	Location	Survey Number: 44/1(P), 44/5(P), 44/6, 44/7, 44/8
		Village: Sundakottai
		Taluk: Aruppukottai
		District: Virudhunagar
		State: Tamil Nadu



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

Table 1.2: Identification of Project Proponent

1	Proponent Name	Tmt.R.Chempakadevi
2	Address	1, Ramasamy Naicker Street, Vadugarkottai, Aruppukottai Town, Aruppukottai Taluk, Virudhunagar District – 626 101.
3	Contact Number	9364530969
4	Email-ID	rambluemetals696@gmail.com

The Proponent can meet the requirement the financial requirement of this project and will ensure that the mining activities are carried out as per statutory requirements.

Table 1.3: Statutory Approvals

S.No	Statutory Approval	Authority	Letter Number and Date	Reference
1	Precise Area Communication Letter	Assistant Director, Dep. of Geology & Mining, Virudhunagar	KV1/878/2018-Minerals dated 26.08.2022.	Annexure-1
2	Mining Plan Approval	Assistant Director, Dep. of Geology & Mining, Virudhunagar	KV1/878/2018-Minerals dated 22.11.2022	Annexure-2
3	Details of other quarries within 500m radius	Assistant Director, Dep. of Geology & Mining, Virudhunagar	KV1/878/2018-Minerals dated 22.11.2022	Annexure-3

The following conditions have been stated in the Precise Area Letter:

- 10m safety distance for odai passing through S.F.No.43 and nearby porombake lands
- 7.5m safety distance for nearby patta lands

The above conditions have been adhered to.

1.3 BRIEF DESCRIPTION OF NATURE, SIZE, LOCATION & PROJECT IMPORTANCE

Table 1.4: Brief Description of Nature of project

1.	Sector	1(a), Non-Coal Mining
2.	Type	Fresh Project
3.	Category	B1 (Cluster Situation)
4.	Mineral Mined	Rough stone, Gravel
5.	Major/Minor Mineral	Minor
6.	Mining method	Opencast mechanized Mining
7.	End use	The top gravel will be supplied to customers. The mined out rough stone will despatched to crushers/other buyers.



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

Table 1.5: Location of the project

S.No	Particulars	Details
1.	Location	Sundakottai village, Arupukottai Taluk, Virudhunagar District, Tamil Nadu
2.	Corner Coordinates	Latitude: 09°28'21.10" N to 09°25'30" N Longitude: 78°10'57.95"E to 78°11'00.00"E
3.	Toposheet Number	58K/2,3,6 & 7

Location details are elaborated in Para 2.3, Chapter-II.

1.3.1 IMPORTANCE TO THE COUNTRY AND REGION:

Rough stone and Gravel from this quarry will meet the domestic demand. There is good demand for the Gravel & stone aggregate, which is the main requisite for the construction/ infrastructure sector. Gravel quarried from this lease will be directly transported to the nearby end users. The boulders will be marketed to the nearby crushers for producing crusher aggregates.

This project in the area will provide both direct and indirect employment opportunities through allied opportunities in logistics, trading, repairing works etc., improved per capita income for local people, improved social welfare facilities like infrastructural build-up, improvement in facilities due to the proposed CER activities of the proponent etc.

1.4 SCOPE OF THE STUDY:

Particulars	Details
Proposal no	SI/TN/MIN/434553/2023
File no	10179
SEAC meeting for issue of TOR	395 th SEAC Meeting held on 27.07.2023
SEIAA meeting for issue of TOR	646 th SEIAA Meeting held on 09.08.2023
Terms of Reference	Received from SEIAA, Tamil Nadu vide their Lr No. SEIAA-TN/F.No. 10179/SEAC/ToR-1526/2023. Dated:09.08.2023
Baseline Data Collection	Carried out by Creative Engineers & Consultants , Chennai for Summer Season (March – May 2023)



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

Based on the terms of reference, data collection, the Environmental Impact Assessment was carried out for the project area (core zone and the buffer zone (10km radius from the core zone) and the following studies were covered:

- Collection of primary and secondary data relevant to the project.
- One-Season baseline monitoring for environmental parameters such as air, water, noise, soil, flora & fauna, etc. Analysis of parameters in in-house laboratory.
- Documentation of EIA/EMP report with inclusion of relevant studies conducted by other bodies into the EIA/EMP report.
- Identification of significant environmental parameters that are prone to get affected due to pollution. Namely, Air, Water, Noise, Soil, Biological and Land Environment.
- Evaluation and determination of suitable mitigation measures to reduce and control the said pollution.
- Prediction of post project concentration (baseline + incremental) with respect to air environment for core zone and buffer zone.
- Formulation of an Environmental Management plan including administrative aspects for proposed implementation of mitigative measures in time.

This draft EIA/EMP report will be submitted for public consultation, as per rules and procedures in this respect, as per the EIA notification 2006. The opinions, concerns and objections, if any, of the surrounding public and other stake holders connected, will be taken into consideration and compliance report thereon will be submitted to SEIAA, Tamil Nadu in the final EIA/EMP report.

* * * * *



CHAPTER - II

PROJECT DESCRIPTION

CHAPTER 2

PROJECT DESCRIPTION

2.1 TYPE OF PROJECT:

This proposal involves quarrying of Roughstone and Gravel by Tmt.R.Chempakadevi using mechanized opencast method for the lease period of 5 years.

2.2 NEED & JUSTIFICATION FOR THE PROJECT:

There is a huge demand for construction material and the entire material produced from this quarry will be used in the local construction / infrastructure sector. Considering the following favorable factors it is practically possible to achieve the proposal within the planned period and this proposal is fully justified.

- Availability of good quality proved reserves
- Techno economic viability of the scheme
- Better approachability to the project, availability of logistic facility in proximity to the site
- Economic and Socio Economic Benefits to the region

2.3 LOCATION:

A brief description of the mining area, along with the location, coordinates, accessibility, etc. has been details below in Table No.2.1.

Table 2.1: Mine site description

Location	Sundakottai Village, Arupukottai Taluk, Virudhunagar District, Tamil Nadu
Survey No.	44/1(P), 44/5(P), 44/6, 44/7, 44/8
Coordinates	Latitude: 09°28'21.10" N to 09°25'30" N Longitude: 78°10'57.95"E to 78°11'00.00"E
Nearest Village	Aladipatti - 1.7 km – (NE)
Nearest Town	Arupukottai – 10km - NW
Nearest Highway	(NH-45B) - 8.8Km– (NW)
Nearest Railway Station	Arupukottai – 10km - NW
Nearest Airport	Madurai- 42km – N

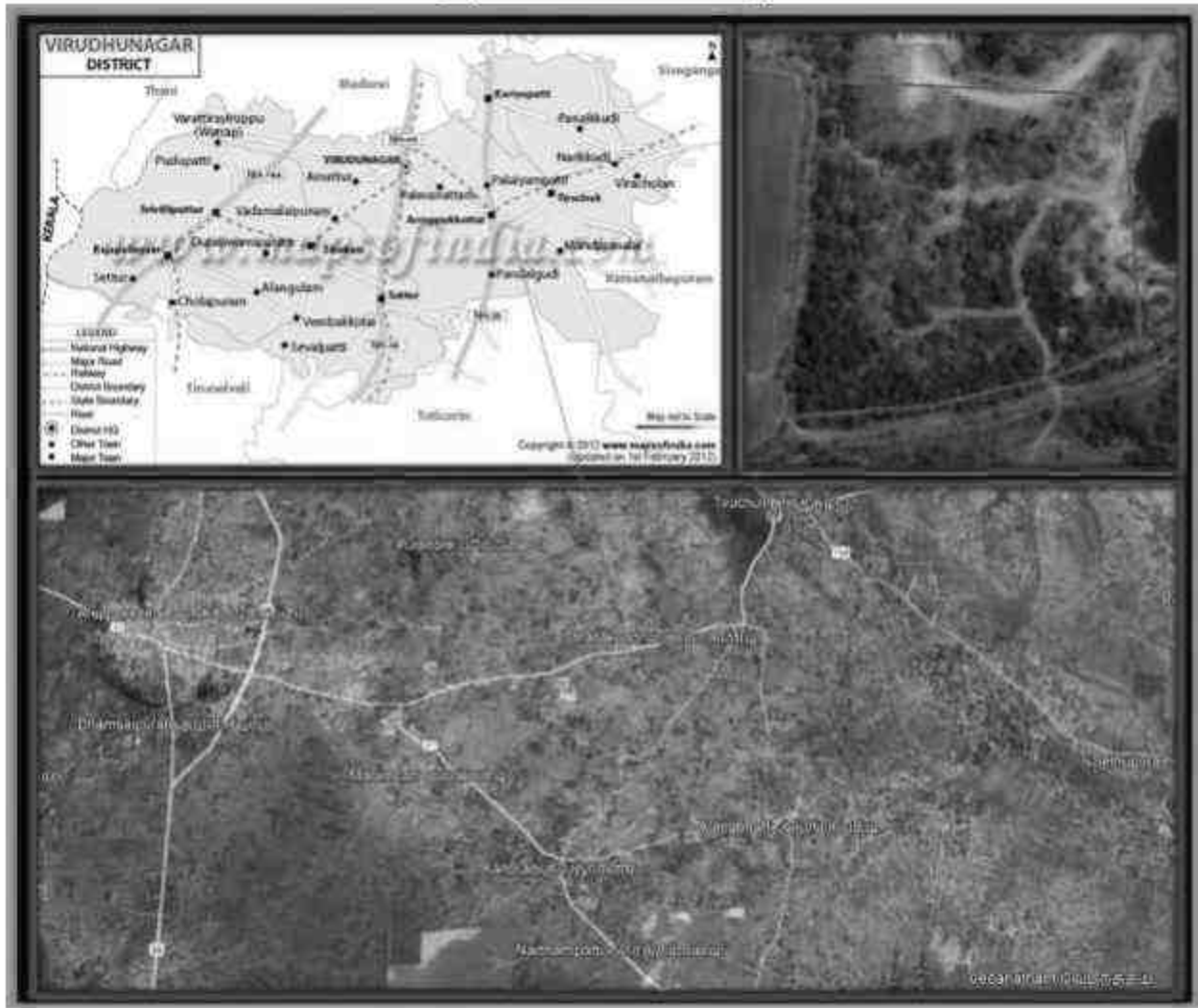


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Accessibility	The lease area can be approached from Alangbhatti to Kallorani Road on the northern side of the lease area at a distance of 0.20Km. This road joins SH-47 on the eastern side of the lease area at a distance of 2.2Km.
Topography	Plain terrain, dry lands with scarce vegetation.
Drainage	There is a drainage channel on the southern side of the lease area for which safety distance of 10m has been left.

Location map is provided in **Figure No.2.1**. The approachability map is provided in **Figure No.2.2**. Corner co-ordinates of the lease area and satellite imagery are shown in **Figure No. 2.3 & 2.4** respectively. Village map for 500m radius from the lease is shown in **Figure No. 2.5**.

Figure 2.1: Location Map



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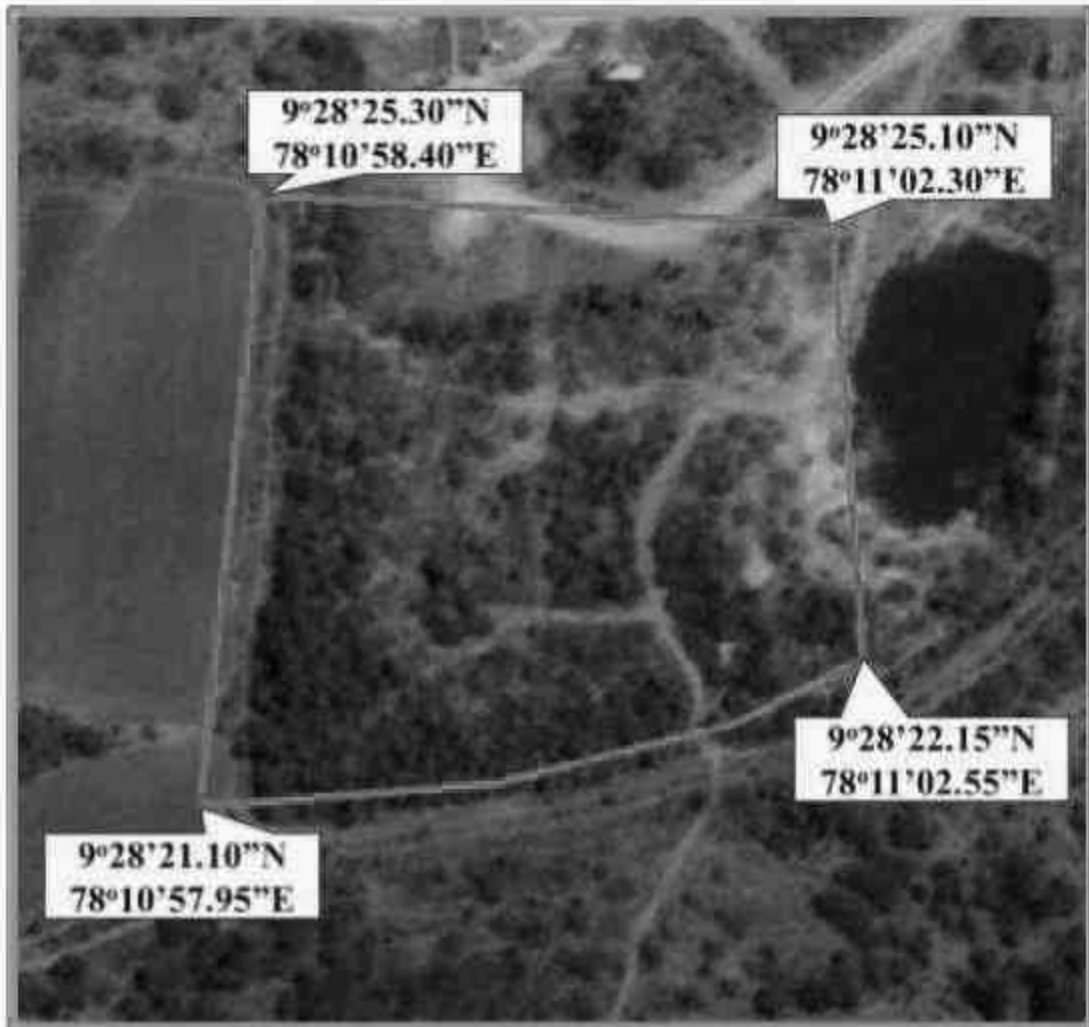
Figure 2.2: Approachability Map



Figure 2.3: Lease Plan



Figure 2.4: Satellite Imagery Showing Corner Co-ordinates of the Project Area



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TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

SITE PHOTOGRAPH



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Figure 2.5: Village Map

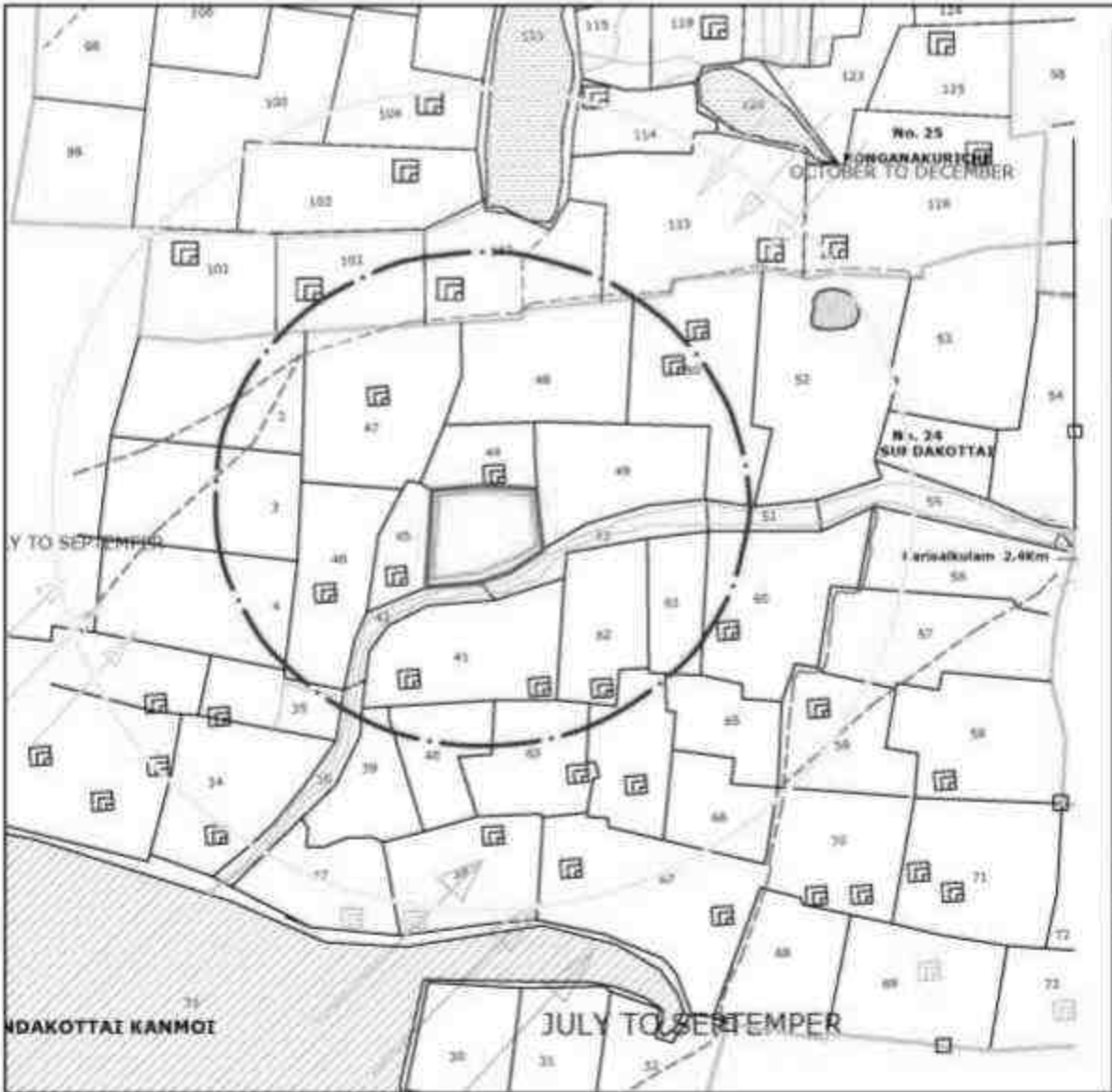


Figure 2.6: Details of features within 500m radius



As per the conditions of the Terms of Reference, the details of structures located within the 100m, 200m, 300m and 500m radius are provided below.

**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

Table 2.2: Features within 500m radius

S.No	Features	Distance
1	Crusher	60m - N
2	Drainage channel	Safety distance of 10m - southern side
3	Village Road	200m N
4	Kanmai	420m S

2.4 LAND CLASSIFICATION:

The lease area of 1.50.0 Ha in S.F.No.44/1(P), 44/5(P), 44/6, 44/7, 44/8 is a patta land in the name of the applicant vide Patta No. 577 (Annexure-V of Mining Plan). The survey no. wise area breakup has been provided below:

Table 2.3: Survey Number wise Area Breakup

Survey Nos	Area in Ha
44/1(P)	0.435
44/5(P)	0.345
44/6	0.145
44/7	0.145
44/8	0.430
Total	1.500

2.5 GEOLOGY:

The area applied for quarry lease is plain terrain with gentle slope towards south and covered by brownish soil followed by weathered rock formation and massive charnokite rock formation. The massive rock formation is noticed / occurred at an average of 6.0m from the surface i.e; below topsoil and weathered rock formation. The top sandy brownish soil and weathered rock portion used for formation of roads, filling the low-lying areas, etc. The massive charnokite occur below the weathered zone is hard, medium to coarse grained with intrusions. The charnokite is played a vital role in construction and road formation civil works. Peninsular gneiss forms the oldest rock formations of Archean age, in which the massive formation of Charnokite lies over with rich accumulation of recent quaternary formation. On regional scale the Chamokite formations trends along NE-SW with a dip of 70° SE

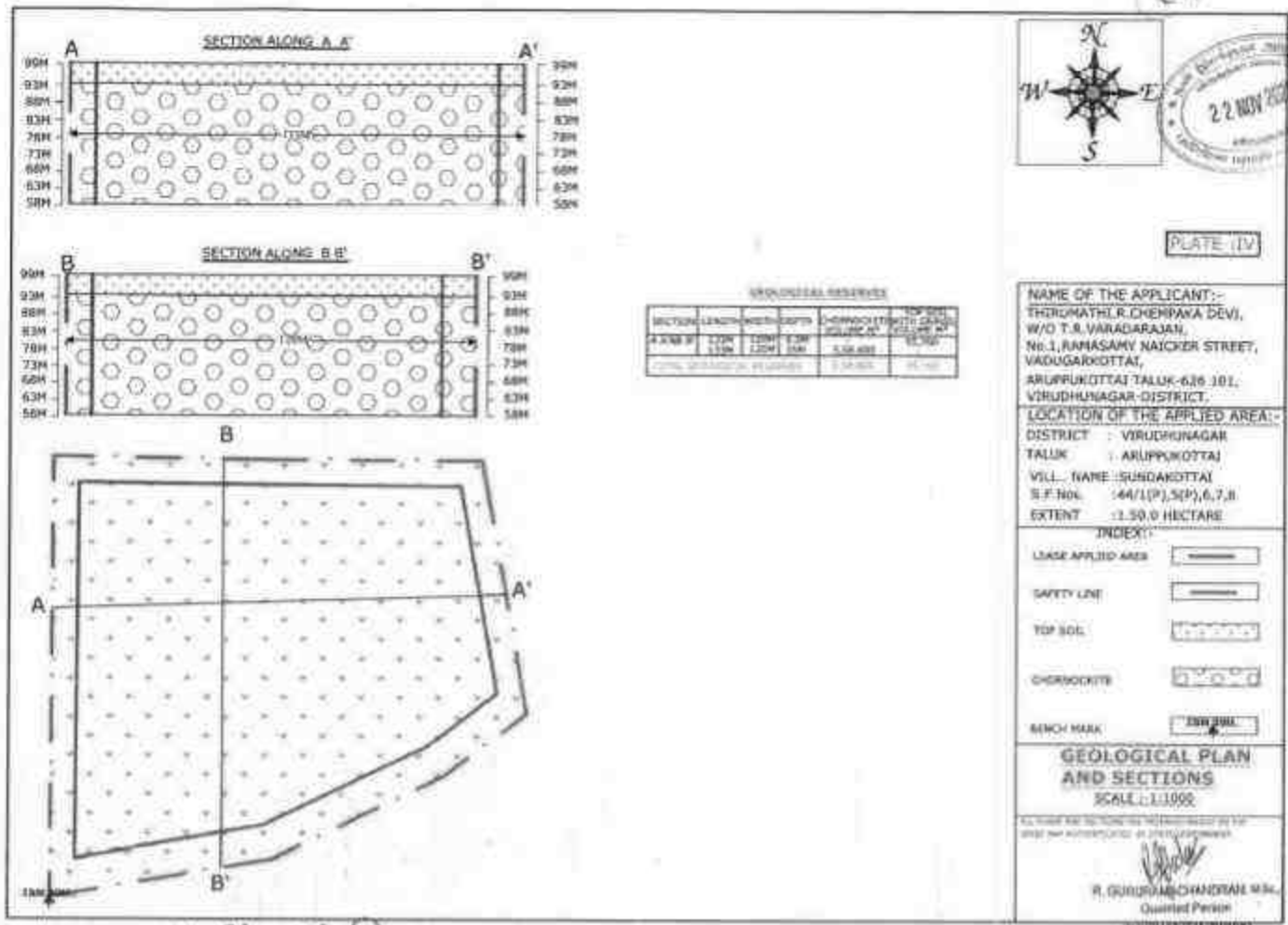
Table 2.4: Geological succession of the area

Age	Rock Formation
Recent	Quaternary Weathered Rock Formation
	-----Unconformity-----
Archean	Charnokites Peninsular Gneiss Complex



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Figure 2.7: Geological Plan & Cross Section



2.6 SIZE AND MAGNITUDE OF THE OPERATION:

- The proposed mining will be done by open cast semi mechanized mining method.
- Life of mine will be 5 years.
- It is proposed to mine out 1,50,675m³ of Roughstone and 69,600m³ of Gravel during the plan period of 5 years upto a depth of 41m.
- There is no waste generation anticipated in this quarry operation since the entire excavated material will be transported to buyers.



DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE, ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.

2.6.1 RESERVES:

Table 2.5: Geological and Mineable Reserves

Type of reserves	Rough stone in m ³	Gravel in m ³
Geological Resources	5,58,600	95,760
Mineable reserves	1,50,675	69,600

The mineable reserves is arrived after considering the safety distance as per the Precise area letter.

2.6.2 MINING METHOD:

Opencast mechanized mining using jackhammer drilling, blasting, excavation through excavator & mineral transport through tippers will be carried out. The top gravel is soft and can be directly excavated. The rough stone below will be blasted and then excavated. Bench height of 5.0m & 5m width is considered.

Table 2.6: Details of Equipments

SI. NO	NAME OF THE EQUIPMENT	CAPACITY	REQUIRED
1	Excavator with Rock breaker attachment	0.90m ³ bucket capacity	1
2	Tipper	5/10 tonnes	3
3	Tractor mounted compressor with jack hammer	175 CFM	2

2.7 PROPOSED SCHEDULE FOR APPROVAL AND IMPLEMENTATION:

The proponent propose to implement the production immediately after obtaining all the statutory approvals such as CTE, CTO, etc. The proponent will comply with the environmental clearance conditions during mining operations. The schedule of project implementation envisaged for this project is provided below. This is a tentative schedule subject to various factor, hence unforeseen variations may occur.



DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE, ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.

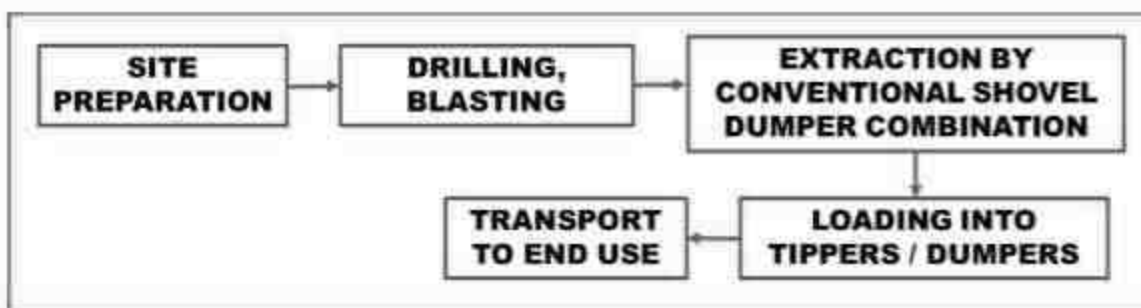
Table 2.7: Proposed Schedule of Implementation

Activities	Months					
	Zero Date	1	2	3	4	5
Obtaining Environmental Clearance						
Obtaining Consent from State Pollution Control Board						
Lease Execution						
Equipment mobilization and Commencement of Mining activity after following all the Statutory Requirements						

2.8 TECHNOLOGY AND PROCESS DESCRIPTION:

The quarry operations involve drilling, blasting, excavation, loading and transportation of Roughstone to buyers. The production of Roughstone in this quarry involves jackhammer drilling and blasting. The primary boulders are removed from the pits by excavators and further made to smaller sizes by rock breakers attached in excavators. It is a conventional opencast semi mechanized method of mining. The process flow diagram of this project is provided below.

Figure 2.8: Process Flow Diagram



2.9 PROJECT DESCRIPTION:

2.9.1 PAST PRODUCTION:

This is a proposed quarry. As such no mining activities have been carried out in this lease area.

2.9.2 PRODUCTION & WASTE DISPOSAL:

The yearwise production has been provided below.

Table 2.8: Production Schedule During Plan Period

Year	Roughstone (m3)	Gravel (m3)
I	30250	30600
II	28375	10200
III	30450	9600



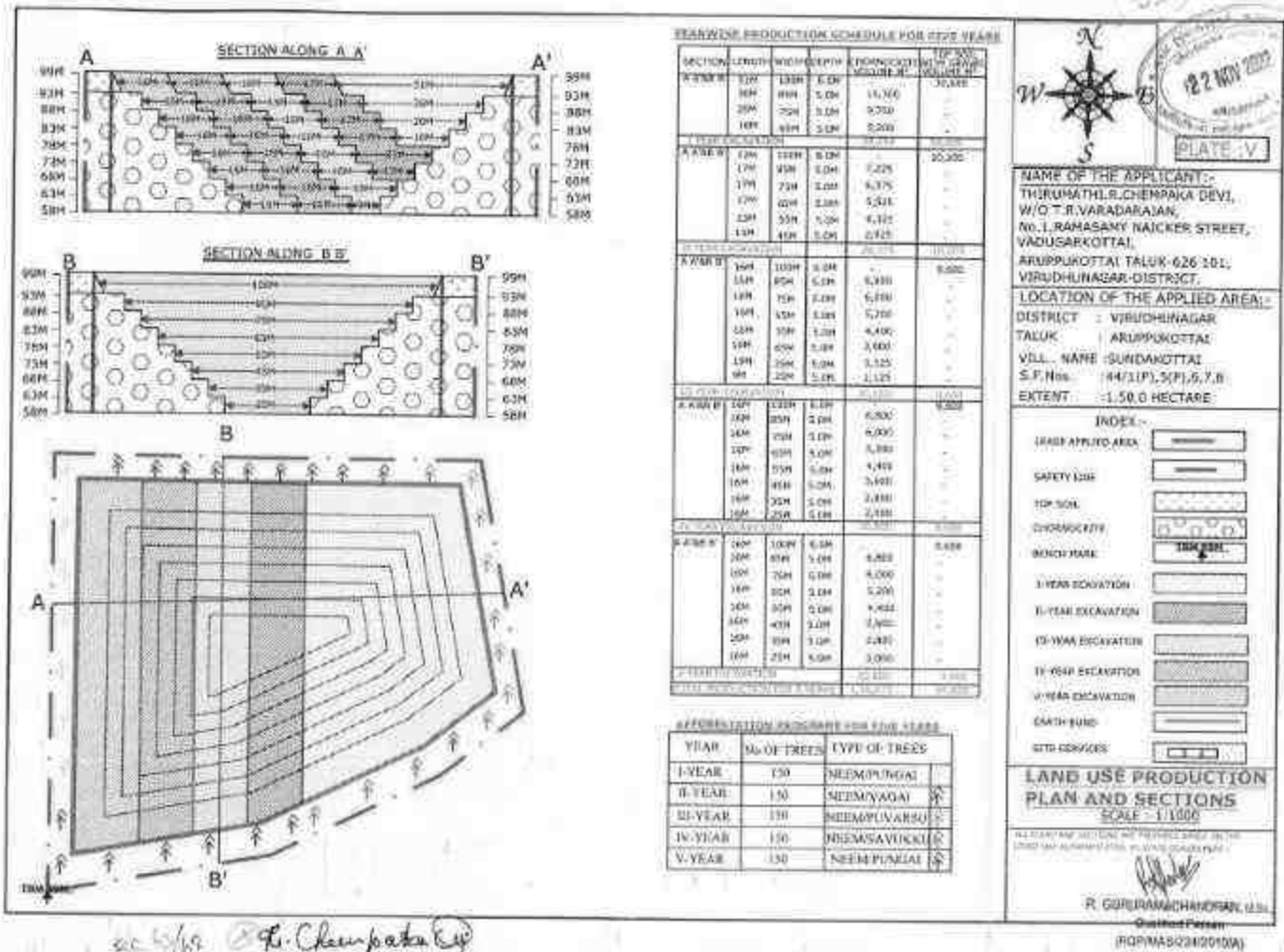
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IV	30800	9600
V	30800	9600
Total	1,50,675	69,600

Waste Disposal during Plan Period:

There is no waste generation anticipated in this quarry operation since the entire excavated material will be utilized. The top overburden in the form of Gravel and weathered rock will be loaded into tipper and marketed to needy customers on payment of necessary Fees to Government. The excavated rough stone will be excavated and loaded into tipper to the needy buyers for producing crusher aggregates, M Sand.

Figure 2.9: Year wise Plan & Cross Section



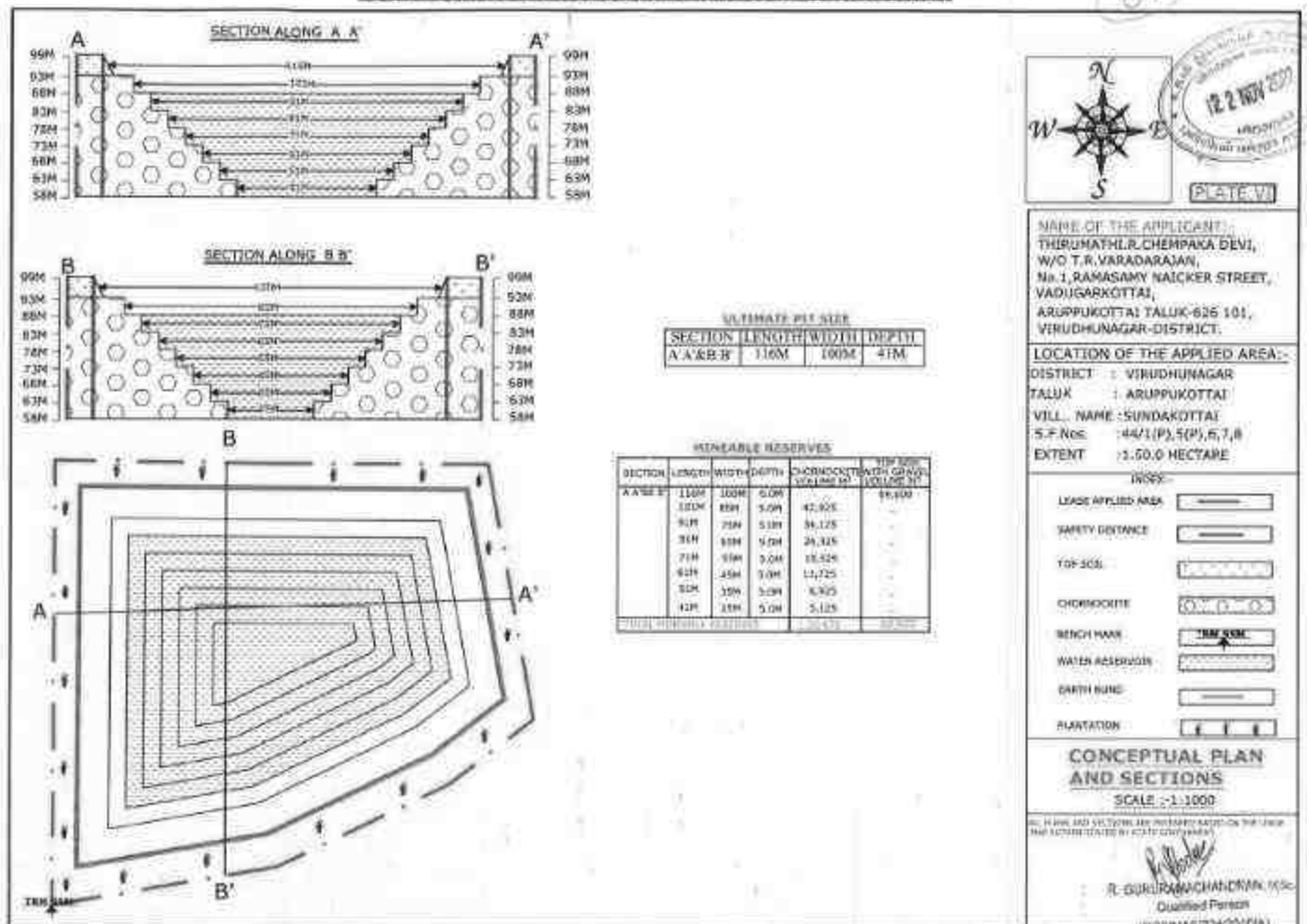
DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE, ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.

Table 2.9: Ultimate Pit Dimensions

LENGTH(m)	WIDTH(m)	DEPTH(m)
116	100	41

The ground water table on the surface in this area is quite deeper. Hence, ground water intersection in not envisaged. The Conceptual Plan & Cross section are shown in **Figure No. 2.11.**

Figure 2.10: Conceptual Plan & Cross Section



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LAND DEGRADATION/UTILIZATION:

The land use pattern at present and at the end of the quarrying period has been provided below.

Table 2.10: Land Use

S.No	Land Use	Present Area (Ha)	Area at the end of quarrying period (Ha)
1	Quarrying Pit	--	0.86.5
2	Infrastructure	--	0.01.0
3	Roads	--	0.02.0
4	Green Belt	--	0.60.5
5	Unutilized	1.50.0	--
	Total	1.50.0	1.50.0

In the post mining stage, an area of 0.865 Ha of mined out area will be left as water body. 0.01Ha will be infrastructure, 0.02 Ha will be roads and 0.605 Ha will be covered with vegetation.

2.9.3 PROJECT REQUIREMENTS:

Table 2.11: Project Requirements

Manpower	20 People directly and more than 50 people indirectly	
Water Requirement and Source	Water Requirement: 10 KLD	
	Details	Quantity (KLD)
	Drinking water and Domestic Use	1.0
	Dust Suppression	8.0
	Green belt	1.0
	Total	10.0
	Source: The required water will be procured initially from outside agencies. Later Rain water harvested in the mine sump can also be used.	
Power Requirement	No electricity needed for mining operation. The minimum power requirement for office, etc will be met from state grid.	
Site Services	This is a proposed project. Site services like mine office, first aid room, rest shelters, toilets etc. will be provided as semi-permanent structures.	
Project Cost	Rs. 50,14,760/- (Including operational + Fixed Asset + EMP cost).	
Funds allocated for socio-economic development	Rs.5.0 Lakhs is allocated under CER budget.	



2.10 DESCRIPTION OF MITIGATION MEASURES:

Scientific and systematic development of mines will be carried out by the project authorities for preserving as well as improving the environmental conditions in and around the mining lease area. Elaborate analysis on impacts and mitigation measures to be adopted on implementation of this project and the same has been dealt in Chapter- IV.

2.11 ASSESSMENT OF NEW & UNTESTED TECHNOLOGY:

There is no new technology that is being implemented. Opencast method of mining which is the proposed method of mining is a proven technology which is technologically and economically viable. No major technological failures are anticipated. A disaster management plan shall be put into place to take care of any unforeseen situation.

2.12 CONCLUSION:

As good environmental preservation is one of the prime motive of the project proponent. It is expected that the project activity will not have any major impact on environmental equilibrium in the study area.

* * * * *



CHAPTER - III

DESCRIPTION OF ENVIRONMENT

CHAPTER 3 DESCRIPTION OF ENVIRONMENT

3.1 GENERAL:

The existing environmental baseline data for the various environmental components were collected in the study area for the purpose of assessing the impact on present environment due to the project activities.

Monitoring was carried out systematically and meticulously as per relevant IS codes, CPCB, MoEF&CC guidelines during **Summer Season (March 2023 to May 2023)** the details of the study are given in this chapter.

For the purposes of this study, the area has been divided into two zones, namely, core and buffer zones. The entire lease area is considered to be the core zone while the buffer zone encompasses a 10 km radius from the periphery of the core zone. The details of villages falling in the study area and other features are given in Index Plan in Figure No - 3.1

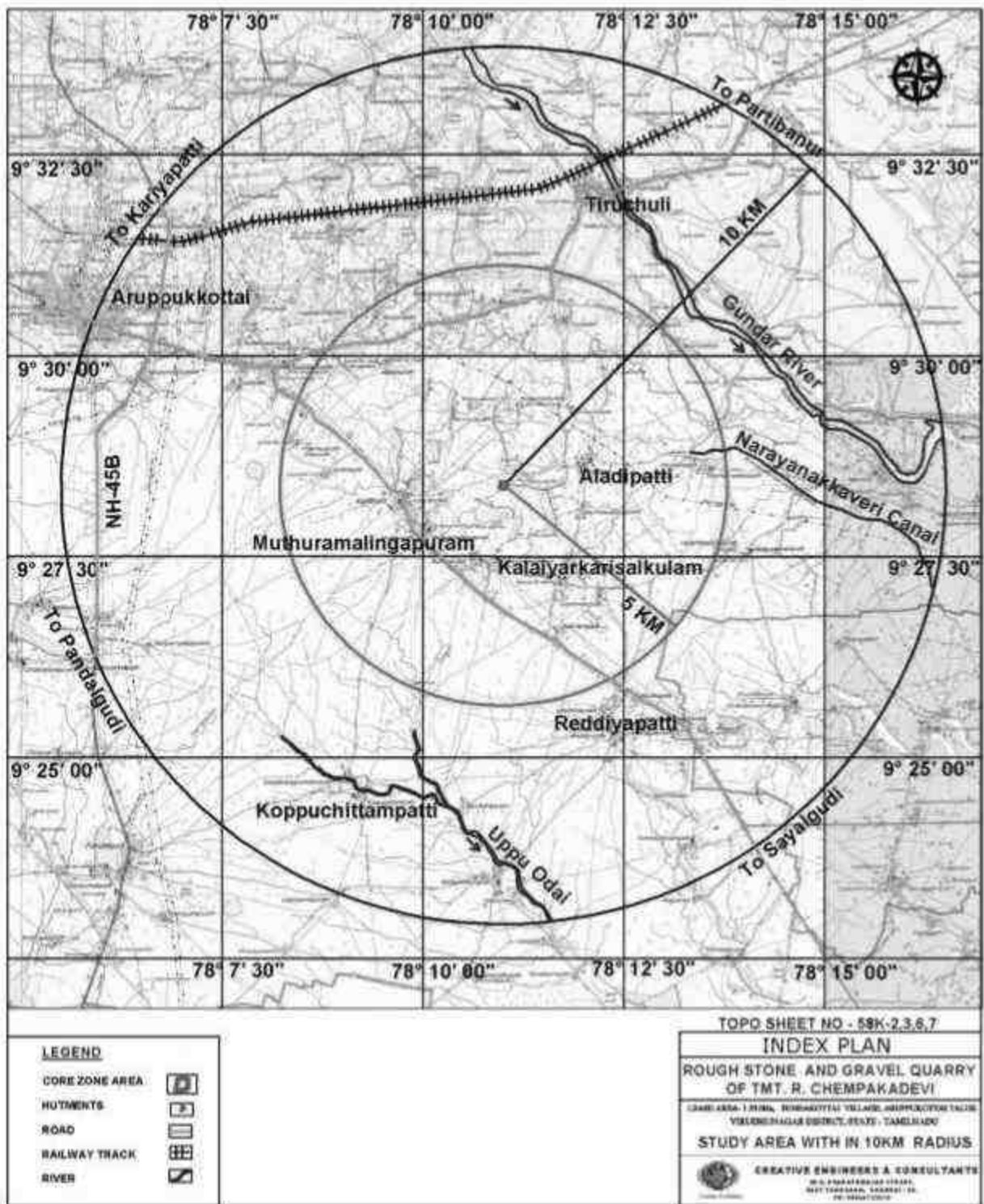
The primary data collection was done by means of field monitoring and the secondary data collection was obtained from published sources and government documents. The details of the baseline data collection which has been elaborated through the course of this chapter has been concised below:

Table 3.1: Type of Baseline Data

S.No	Studies	Parameters / Study	Location
1	Socio Economy	Demographic Data from Census 2011	Core and Buffer Zone
		Sample Survey	Buffer Zone
2	Micro Meteorology	Rainfall Data from IMD, Virudhunagar	Virudhunagar District
		Temperature, Humidity, Wind Speed, Wind Direction	1 Representative Location
3	Ambient Air Quality	PM10, PM2.5, SO2, NOx, CO	1 Core Zone, 4 Buffer Zone
4	Water Quality	Physical and Chemical Parameters	1 Core Zone, 4 Buffer Zone
5	Noise Levels	Ambient Noise	1 Core Zone, 4 Buffer Zone
6	Soil Quality	Physical and Chemical Parameters	1 Core Zone, 2 Buffer Zone
7	Land Use and Land Cover	Land use pattern within 10km study area using RS Satellite	Buffer Zone
		Land use based on Census 2011	Core and Buffer Zone
8	Biological Environment	Flora and Fauna	Core Zone and Buffer Zone
9	Hydrology & Hydro Geology	Hydrogeological profile of the area	Core Zone and Buffer Zone

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Figure 3.1: Study Area Map



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ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

Table 3.2: Environmental Setting of the Study Area

S.No	PARTICULARS	DETAILS
1	Nearest highway	(NH-45 B) – 8.8km (NW)
2	Nearest Railway station	Aruppukottai RS – 10km - NW
3	Nearest Airport	Madurai – 42Km – N
4	Nearest major water bodies	<ul style="list-style-type: none"> ➤ Gundar River-6.0km – (NE), ➤ Narayanakkaveri Canal – 5.5km – (E), ➤ Uppu Odai – 6.0km – (SW)
5	Nearest town/City	Aruppukottai – 9.5km – (NW)
6	Nearest villages	<ul style="list-style-type: none"> ➤ Aladipatti – 1.7km (NE) ➤ Kallorani – 2.1km (W) ➤ Kalaiyarkarisalkulam - 1.5km (S) ➤ Muthuramalingapuram - 1.9km (SW)
7	Notified Archaeologically important places, Monuments	Nil within 10m radius.
8	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 10m radius.
9	Reserved / Protected Forests	Nil within 10m radius.
10	Defence Installations	Nil within 10m radius.
11	Seismic Zone	Zone – II (Least Active)
12	Other Industries in the study area	Other than rough stone quarry & crushers there are no other major industries in the area.

3.2 SOCIO-ECONOMIC CONFIGURATIONS OF THE AREA:

3.2.1 GENERAL:

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

- Identification of villages falling from the study area map with combined Taluk map.
- Collection of primary data through sample survey, village meetings and discussion.
- 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.



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- Details of the amenities available in villages falling in the study area through NIC 2011 census data. The findings of the study are illustrated below:

3.2.2 SECONDARY DATA DESCRIPTION:

The proposed Roughstone and gravel quarry is located in Sundakottai Village, Aruppukottai Taluk, Virudhunagar District. Based on 2011 census data, in the 10km radius there are 65 Rural villages from Three Taluks namely Aruppukottai, Tiruchull, Kamuthi and 3 urban areas of Aruppukottai Taluk namely Aruppukottai (M), Palayampatti (CT), Athipatti (CT) belonging to Virudhunagar and Ramanathapuram District. The demographic profile of the study area is given below:

Table 3.3 Social, Economic and Demographic Profile of the Study Area

Details	Population	Percentage
A. Gender-wise distribution		
Male Population	102703	49.96
Female Population	102888	50.04
Total	205591	100
B. Caste-wise population distribution		
Scheduled Caste	18380	8.94
Scheduled Tribes	222	0.11
Other	186989	90.95
Total	205591	100
C. Literacy Levels		
Total Literate Population	157711	76.72
Others	47880	23.30
Total	205591	100
D. Occupational structure		
Main workers	87259	42.40
Marginal workers	10477	5.10
Total Workers	97736	47.50
Total Non-workers	107855	52.50
Total	205591	100

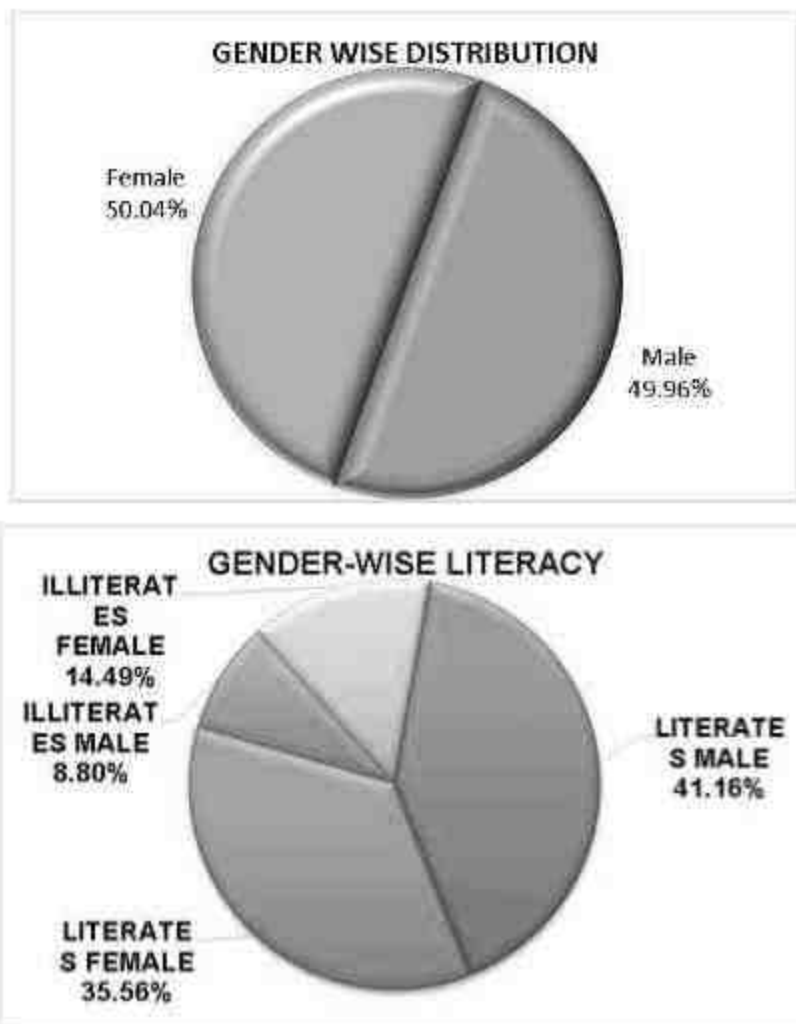
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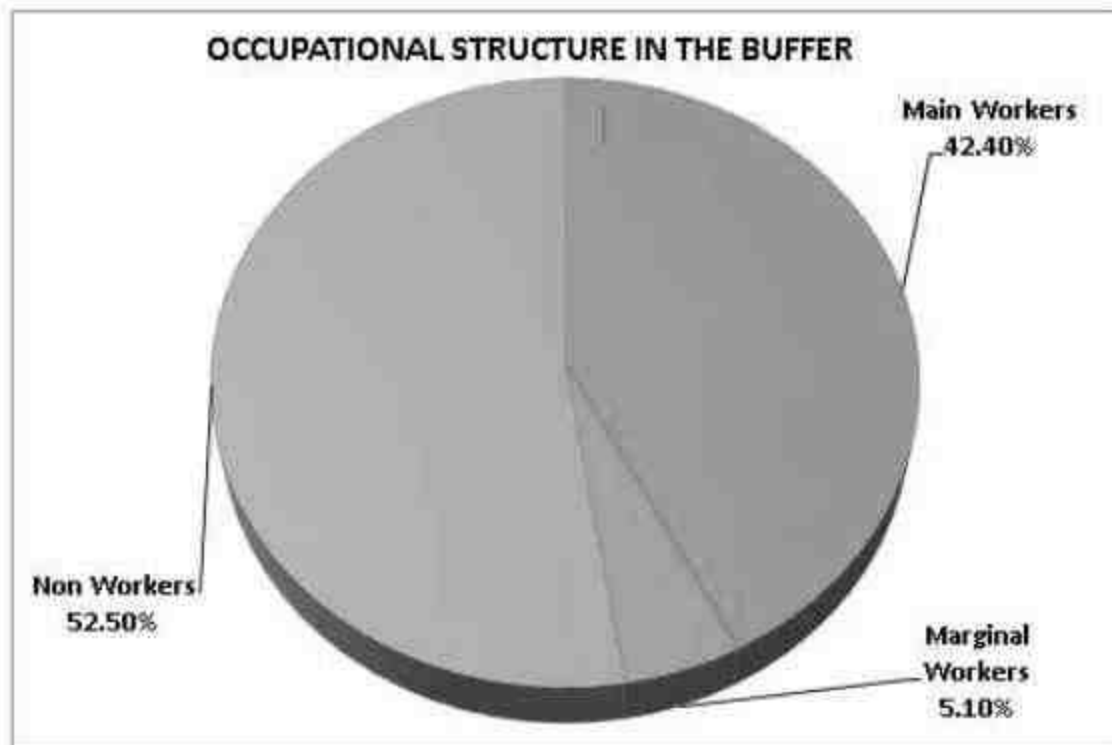
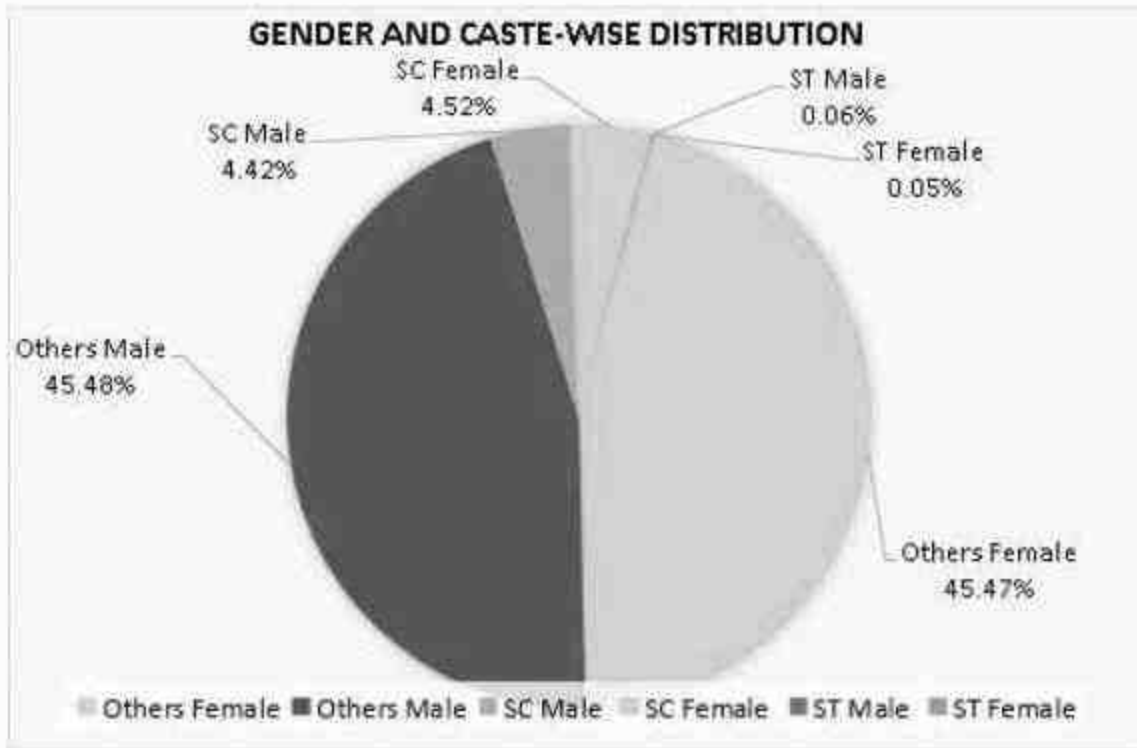
The total population of these 65 rural villages and 3 urban areas is 205591 in which the male population is 102703 (49.96%) and the female population is 102888 (50.04%). This shows that the male and female population ratio is almost equal. Among the total population 0.11% belong to Scheduled Tribes, 8.94 % are Scheduled Caste and the balance 90.95 % people belong to other castes. Among the total population, 76.71% of the people are literate.

Among the total population, 41.16% are literate males and 35.56% are literate females. This shows that the male literates are slightly more than the female literates.

The village wise population, literacy levels and occupational structure details are given in **Annexures 4 and 5**. The demographic structure within the buffer zone is shown diagrammatically in **Figure No – 3.2**.

Figure 3.2: Demographic Structure in Buffer Zone





3.2.3 DETAILS OF AMENITIES:

Based on 2011 census data, regarding the educational facilities, there are totally 63 Primary Schools functioning in these 65 rural villages. Among them 19 villages have no primary school, 36 villages have 1 primary schools, 6 villages have 2 primary schools, 2 villages have 3 primary schools, 1 villages has 4 primary schools , 1 villages have 5 primary schools.

Table 3.4: Primary Schools in the Buffer Zone Rural Villages

S.No	No of Rural Villages	Number of primary schools	Totals
1	19	0	0
2	36	1	36
3	6	2	12
4	2	3	6
5	1	4	4
6	1	5	5
Total	65		63

Table 3.5: Education Facility Availability

PARTICULARS	Available in village
Govt Primary School	46
Govt Middle School	19
Govt Secondary School	13
Govt Senior Secondary School	7
Govt Arts and Science Degree College	0
Govt Engineering College	0
Govt Medicine College	0
Govt Management Institute	0
Govt Polytechnic	0
Govt Vocational Training School/ITI	0

Better and higher education facilities are available in nearby Virudhunagar & Ramanathapuram city corporation.

Table 3.6: Healthcare Amenities Availability

PARTICULARS	Available in village
Community Health Centre	1
Primary Health Centre	2
Primary Health Sub Centre	22
Maternity And Child Welfare Centre	5
TB Clinic	4
Hospital Allopathic	0
Hospital Alternative Medicine	0
Dispensary	2
Veterinary Hospital	5

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Mobile Health Clinic	0
Family Welfare Centre	2

Better Healthcare facilities are available in nearby town like Virudhunagar & Ramanathapuram City Corporation.

Table 3.7: Infrastructure Facilities

Particulars	Available in village
Tap Water-Treated	45
Covered Well	19
Hand Pump	26
Tube Wells/Borehole	27
Post office	3
bus services	53
Commercial Bank	4
Cooperative bank	8

The details of the educational, medical and infrastructural facilities available in the buffer zone is provided in **Annexures- 6-8**.

3.2.4 SAMPLE SURVEY:

Study of the nearby villages to know about socio-economic conditions, including aspirations and requirements of the people show the following:

- Predominantly the study area is seasonal dry, barren land.
- Patches of plantation and agriculture are observed during the monsoon season.
- Majority of the people are small farmers and others are working in the nearby industries.
- Since agnculture is predominantly rainfed and the water is available only for four months, during the rest of the time they have less employment opportunities. Other occupations include construction workers, vendors, etc.
- Other allied activities livestock rearing and poultry farming are also found.
- Reasonably better amenities like approach road bus facility, electricity, mobile phone connectivity, Public Distribution System, banks etc are available.
- Bore well is the main source for drinking water. There are OHT's, Ground level tanks, public taps are available.



3.3 EXISTING ENVIRONMENTAL QUALITY

3.3.1 MICRO-METEOROLOGY

3.3.1.1 General:

The meteorological conditions in an area regulate the dispersion of air pollutants being released into the atmosphere. The principal variables are horizontal convective transport i.e. wind speed and direction and vertical convective transport, i.e. mixing height, stability class and topography of the area.

3.3.1.2 Historical Meteorological Data:

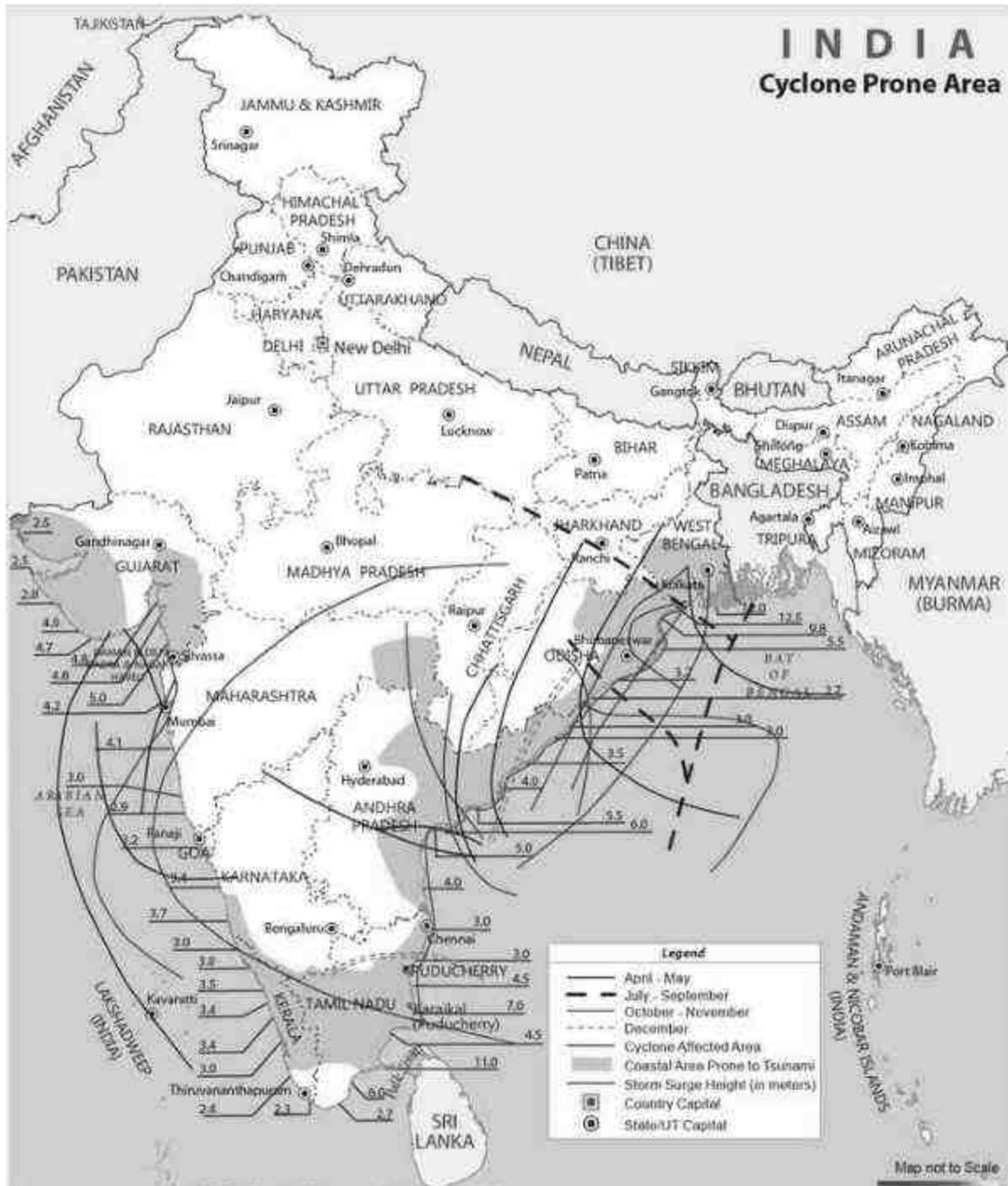
A. Cyclones And Depressions

Cyclonic storms and depressions in Bay of Bengal affect the East Coast of India. Isolated ones, forming in January to March in the South Bay of Bengal move West-North-westwards and hit Tamil Nadu coast. In April and May, cyclonic storms and depressions form in the South and adjoining Central Bay and move initially to the Northwest, then North and then recurve to the Northeast striking the Arakan coasts in April and Andhra Pradesh (AP)-Orissa-West Bengal (WB) – Bangladesh coasts in May. Most of the monsoon (June – September) storms develop in the central and in the north bay and move west – north - westwards affecting AP – Orissa – WB coasts. Post monsoon (October – December) storms form mostly in the south and central Bay, recurve between 150 and 180 N affecting Tamil Nadu – AP – Orissa – WB – Bangladesh coasts.

Figure No - 3.3 depicts the history of cyclonic storms, which have struck the Indian coast during the months of October, November and December during the last 75 years. (**Source: Vulnerability Atlas of India series, above figure accessed from www.maps of india.com**). East coast is prone to cyclonic storms round the year but mostly these occur prior to SW i.e., in May and after SW monsoon i.e., in October and November.

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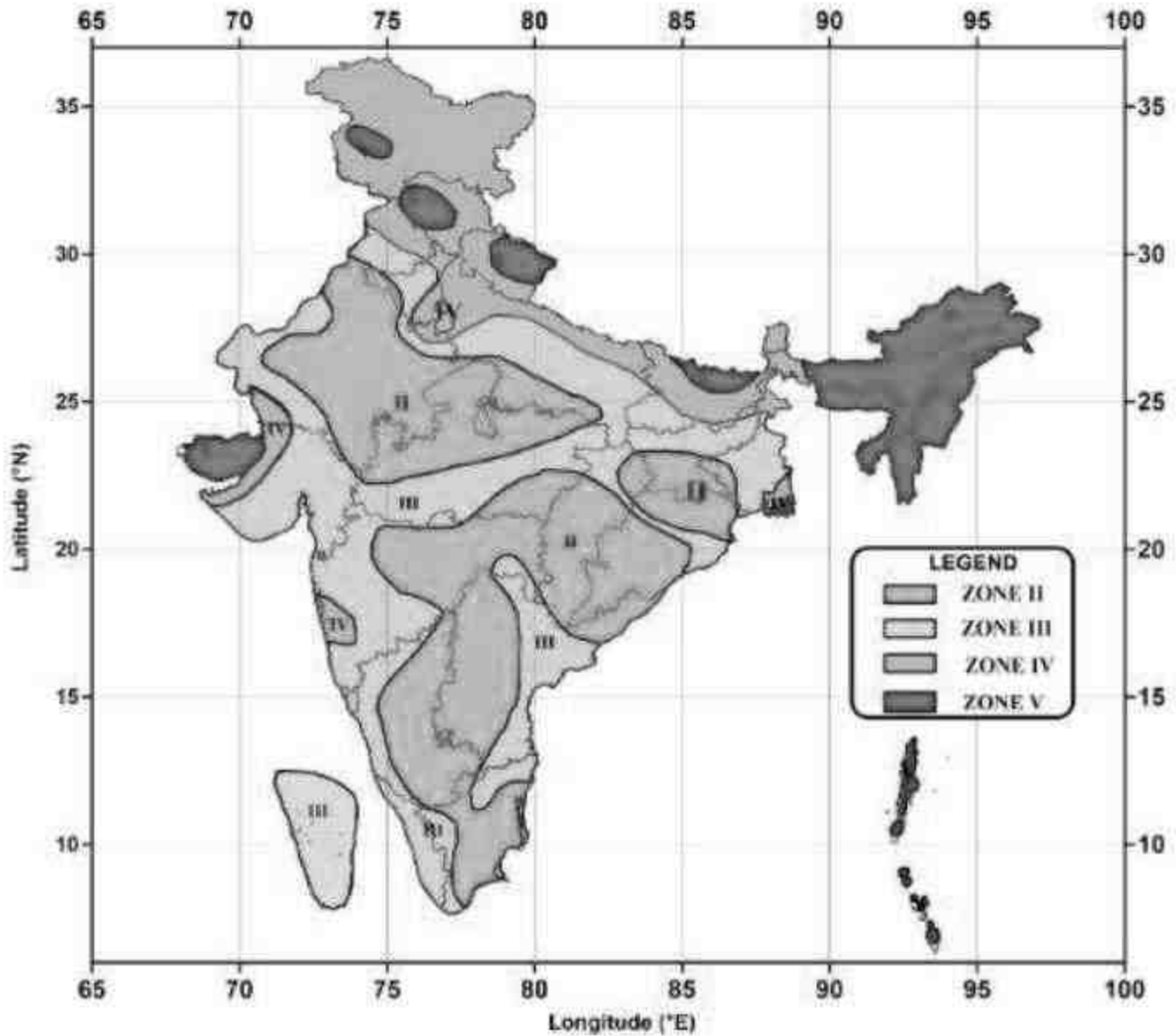
Figure 3.3: History of Cyclonic Storms



B. SEISMIC DATA

From the seismic zone map of India as depicted in the **Figure No - 3.4**, it can be seen that the project site and study area falls in the Zone – II and is described as least active zone.

Figure 3.4: Seismic Zone Map of India



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C. Climate and Rainfall Data:

Temperature: From the middle of February, temperature increases steadily. The weather is quite hot in May and June and the maximum temperature sometimes reaches 40°Celsius. With the onset of the southwest monsoon by the end of May or beginning of June, there is some drop in temperature.

Cloudiness: During the months of April and May, the skies become heavily clouded and threatening in the afternoons on many days when thunderstorms follow. In the southwest and northeast monsoon seasons, the sky is heavily clouded or overcast.

Winds: Generally light to moderate in strength and NW-SW and vice-versa. Between May and September winds are mainly north westerly or westerly. From October to February winds are mainly north easterly or northerly.

Rainfall: Main rainy season is from October to the middle of January. November is generally the rainiest month.

Rainfall data collected by Virudhu Nagar, IMD station for the period of 2011 to 2020 is given in **Table No.3.8**. Rainfall histograms are presented in **Figure No - 3.5 and 3.6**.

Table 3.8: Average Annual Rainfall Data (2011-2020)

YEAR	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total Rainfall
2011	85.49	162.8	109.57	201.3	119.75	392.46	313.13	227.99	199.02	146.11	190.62	197.52	2345.76
2012	16.29	18.37	76.82	297.85	81.31	192.98	223.09	287.28	155.75	234.49	127.34	14.38	1725.95
2013	10.22	43.85	46.9	14.44	27.26	15.48	2.4	115.17	43.3	118.37	68.61	84.27	590.27
2014	11.2	2.25	7.42	14.03	187.33	9.68	9	78.69	65.2	217.23	146.17	55.08	803.28
2015	4.45	3.43	31.39	95.62	114.89	17.83	28.19	53.96	84.73	103.78	279.24	140.03	957.54
2016	0.24	0.03	1.71	5.88	85.2	16.88	69.79	39.75	47.21	66.65	49.6	60.33	443.27
2017	20.72	2.81	15.1	3.18	32.84	7.88	27.54	42.11	62.59	40.74	42.35	17	314.86
2018	0.74	1.28	11.62	21.13	66.02	14.49	33.67	41.94	47.92	134.91	68.92	7.28	449.92
2019	5.08	2.26	3.23	2.33	4.5	17.83	18.5	71.16	163.58	251.1	109.63	88.91	738.11
2020	3.87	0.48	0.11	24.2	69.81	32.41	40.51	45.93	94.14	138.83	241.45	139.88	831.62
NORMAL	18.5	23.5	37.6	76.8	60.2	18.3	31.1	51.6	80.8	191	175.5	64.7	829.6

Source - IMD GRID - Virudhunagar District report



Figure 3.5: Monthly Average Rainfall

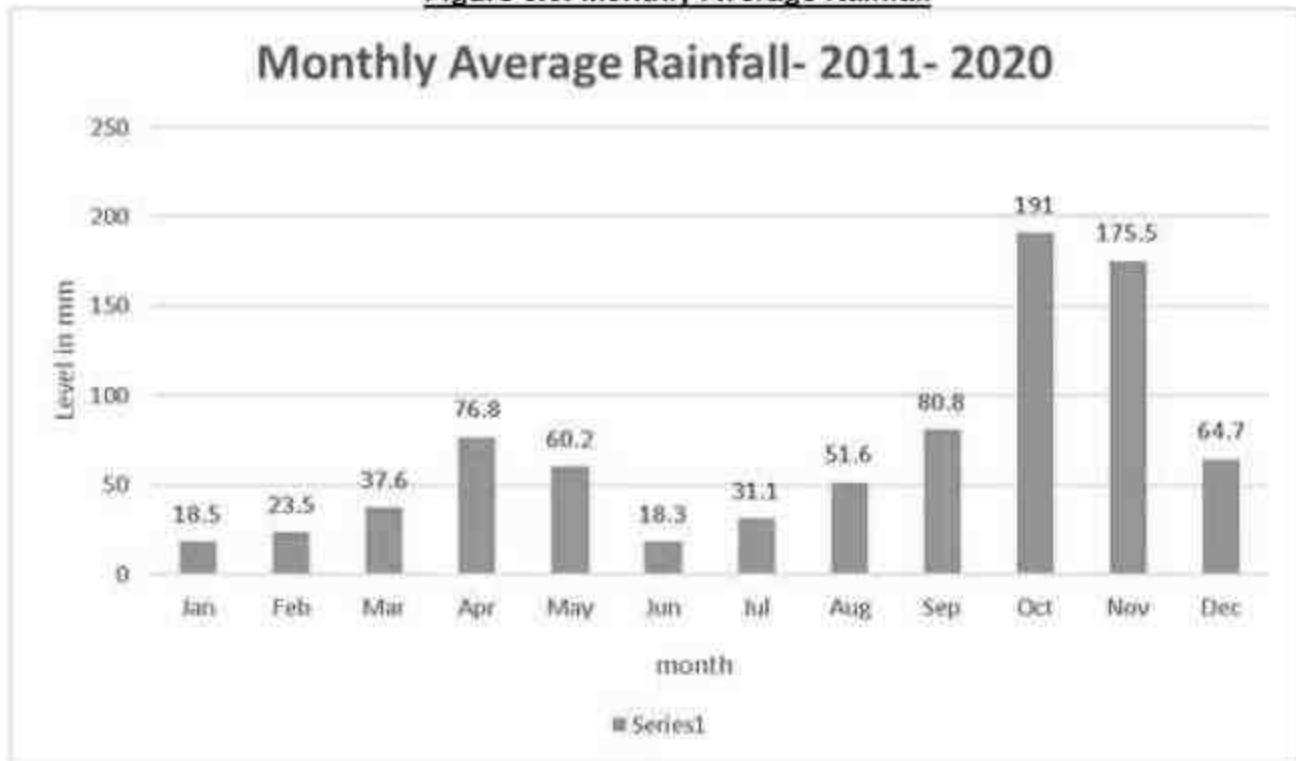
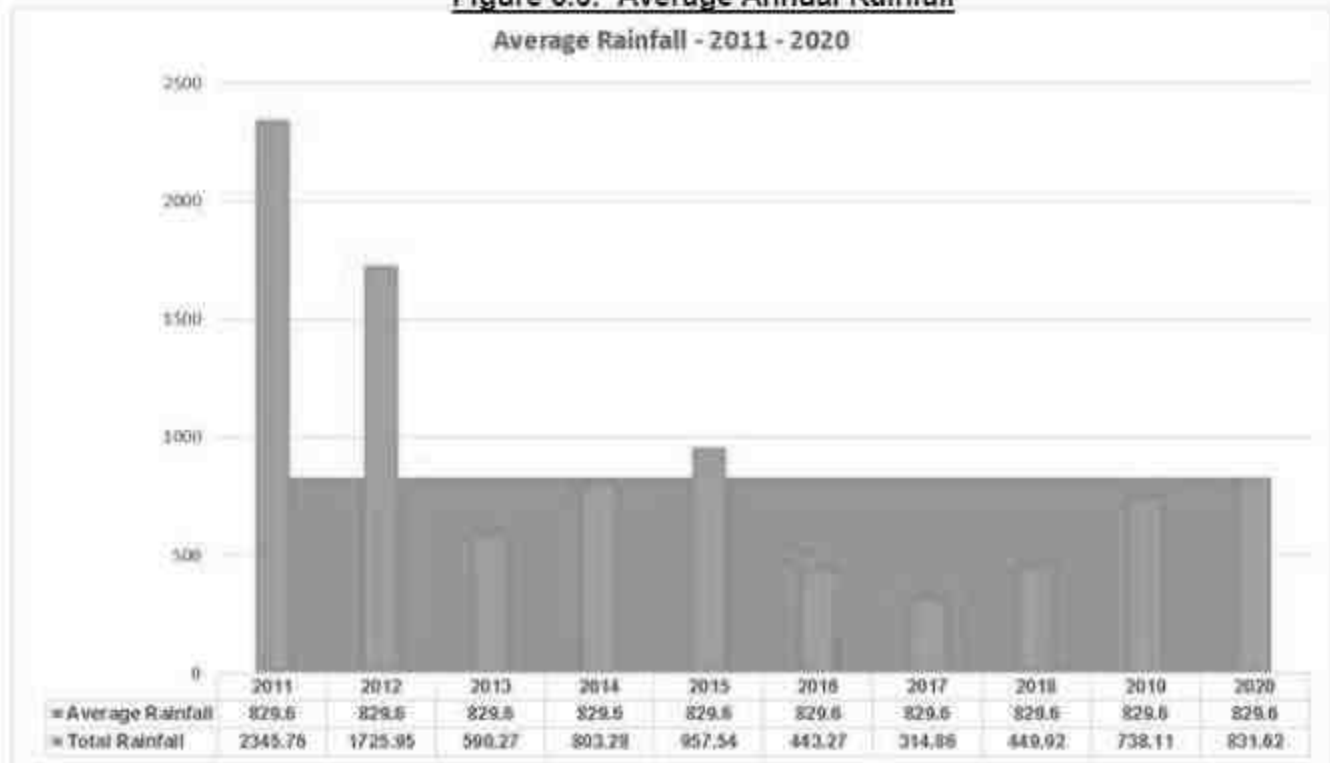


Figure 3.6: Average Annual Rainfall



3.3.1.3 SITE SPECIFIC METEOROLOGICAL DATA:

Micrometeorology and microclimatic parameters of wind velocity, wind direction, ambient temperature, relative humidity, were collected throughout the monitoring period.

DATA ANALYSIS:

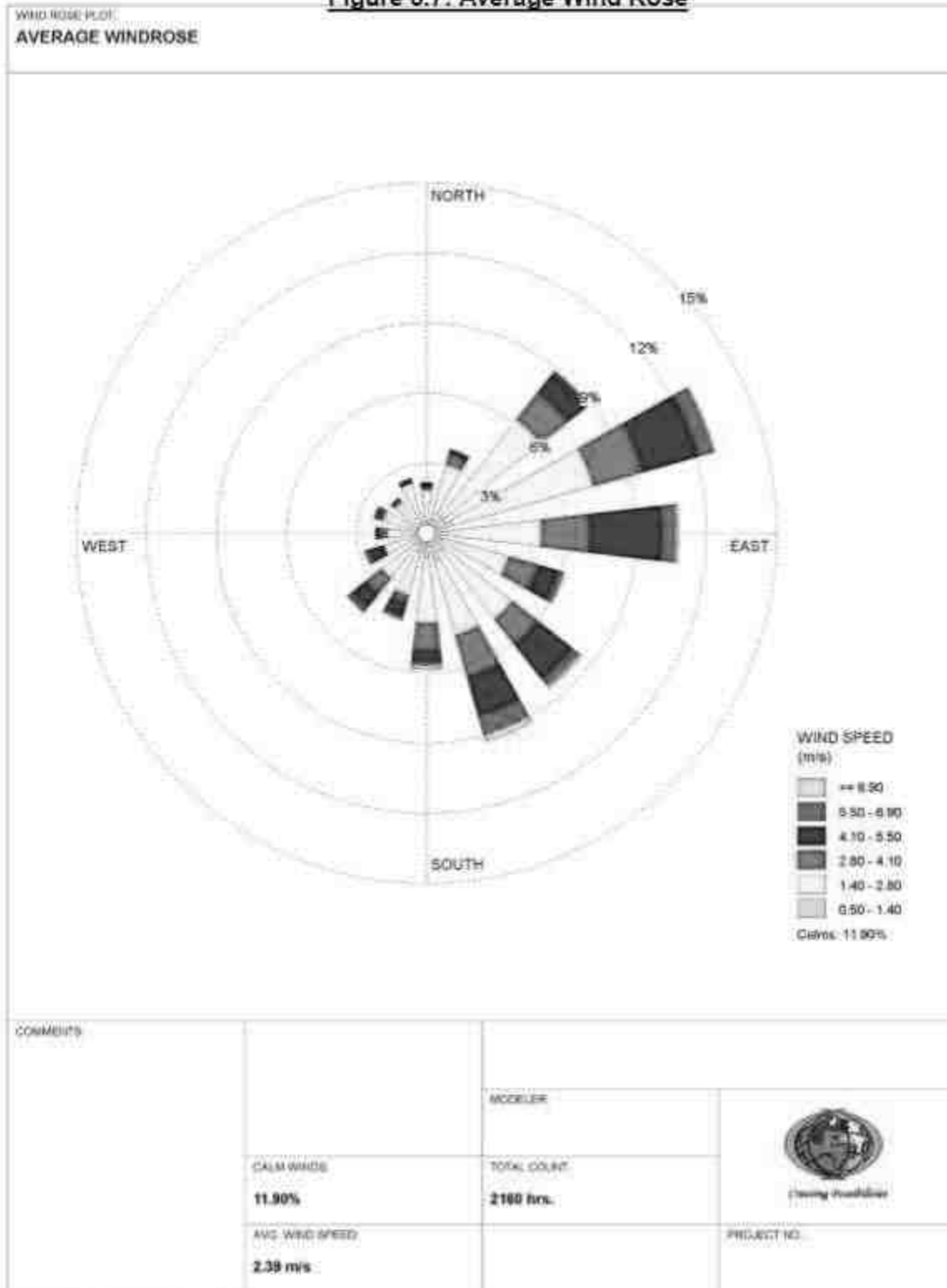
The temperature in the area during the study period ranged from 21.0°C to 40.3°C while the relative humidity varied between 20.8 – 95.2%. The wind speed during the study period ranged from <1.8 to 29.9 km/h. The predominant wind direction is from ENE. The meteorological data are presented in **Table no – 3.9**. The average wind rose is depicted in **Figure No - 3.7**.

Table 3.9: Meteorological Data

Season: Winter Season (March 2023 to May 2023)			
S.NO	PARAMETERS	MIN	MAX
1	Temperature In °c	21.0	40.3
2	Humidity in %	20.8	95.2
3	Wind speed in km/hr	<1.8	29.9
4	Predominant wind direction from	ENE	

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Figure 3.7: Average Wind Rose



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3.3.2 AMBIENT AIR QUALITY (AAQ):

Ambient Air quality has been assessed through a network of 5 ambient air quality stations. The following methodology has been considered for design of ambient air quality monitoring network in the area. Based on these criteria, 5 numbers of air sampling stations were selected in the area as shown below in Table No.3.10.

- ❖ Topography / terrain of study area.
- ❖ Populated areas within study area.
- ❖ Residential /sensitive areas within study area.
- ❖ Magnitude of surrounding industries.
- ❖ Representation of regional background levels.
- ❖ Representation of cross sectional distribution in down wind direction.
- ❖ Predominant wind direction and wind pattern.

Table 3.10: Air Quality Monitoring

1.	Monitoring Period	Summer Season (March 2023 – May 2023)
2.	Monitoring Location	The location map showing Ambient Air Quality study stations are shown in Figure No- 3.9 .
3.	Methodology	
	Parameter	Protocol
	a. Particulate Matter (PM10)	Gravimetric (IS 5182: Part 23:2017)
	b. Particulate Matter PM2.5	Gravimetric (IS 5182: Part 24:2019)
	c. Sulphur Dioxide	Colorimetric (West & Gaeke Method) (IS 5182: Part 02: 2017)
	d. Nitrogen Dioxide	Colorimetric(Modified Jacob & Hocheiser Method) (IS 5182: Part 06:2017)
	e. Carbon Monoxide	CO Monitor
	f. Silica	Colorimetric (Molybdate Method) NIOSH 7601 -2003
4.	Monitoring Frequency	2 days in a week, 4 weeks in a month for 3 months in a season.

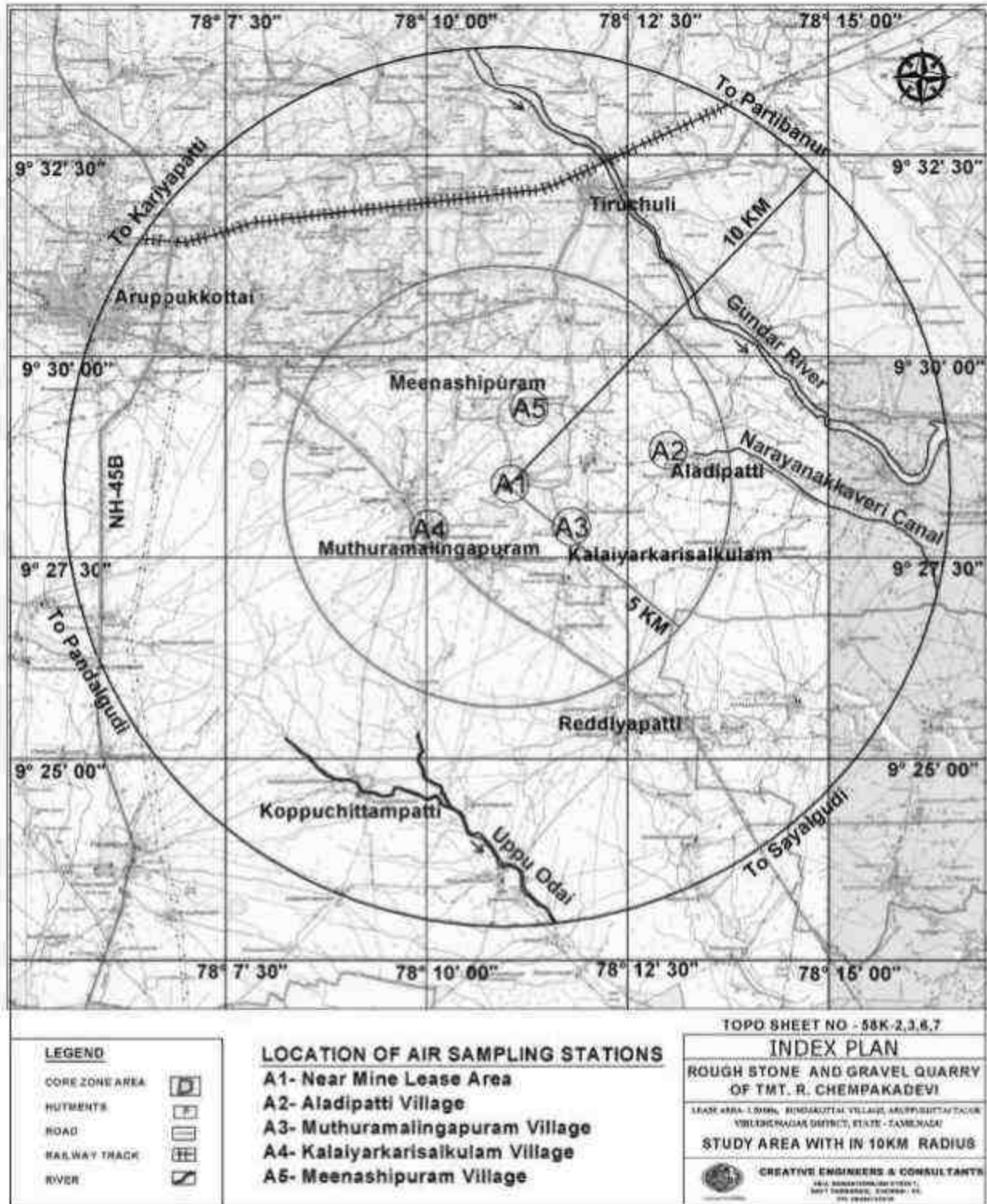
Table 3.11: Air Quality Monitoring Locations

S.NO	LOCATION CODE	LOCATION	DISTANCE FROM CORE ZONE (KM)	DIRECTION
1	A1	Near Mine Lease Area	-	-
2	A2	Aladipatti Village	1.7km	NE
3	A3	Kalaiyarkarisalkulam Village	1.5km	S
4	A4	Muthuramalingapuram Village	1.9km	SW
5	A5	Meenashipuram Village	1.4km	N



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Figure 3.8: Ambient Air Quality Study Stations



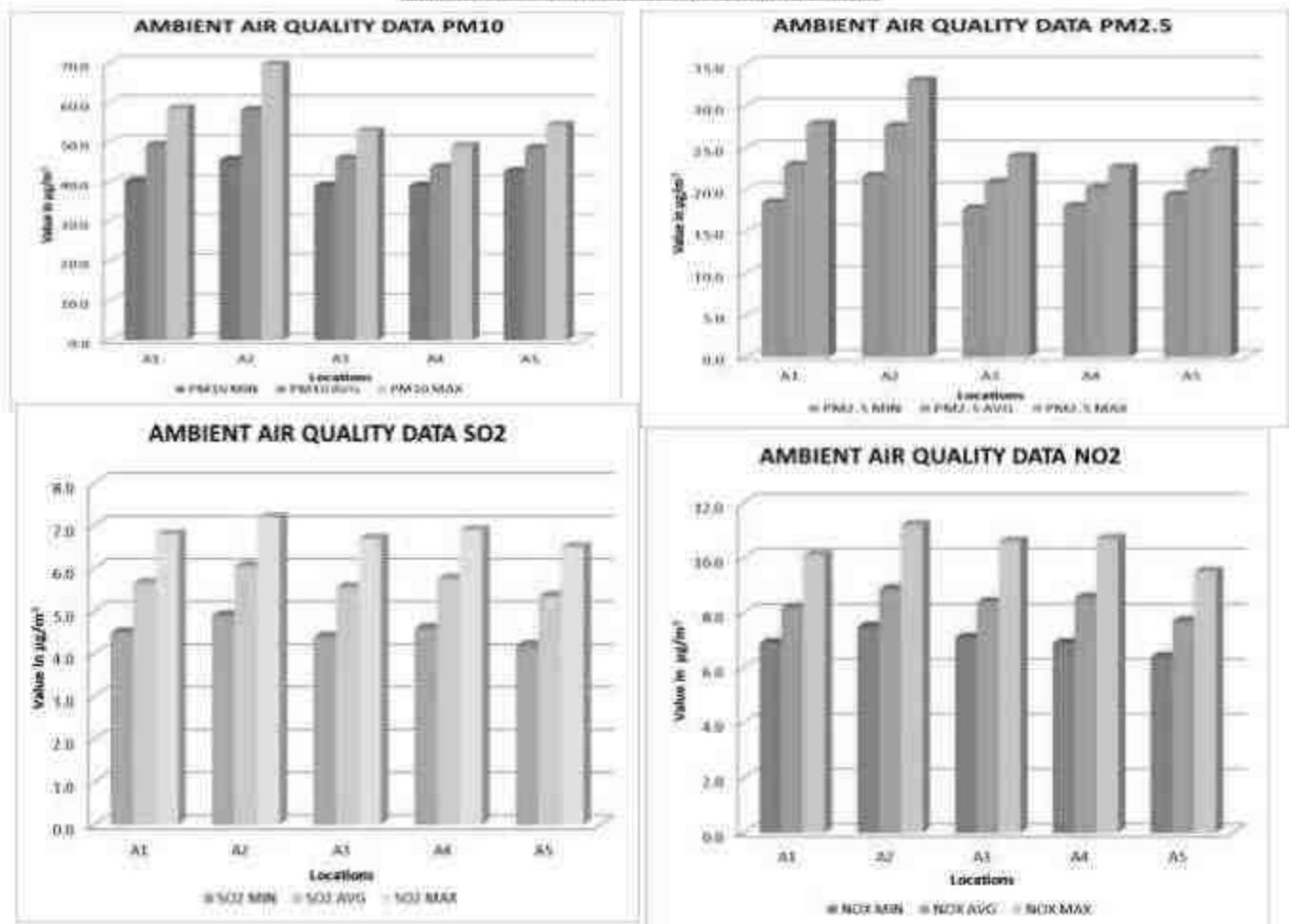
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Table 3.12: Ambient Air Quality Data

PARAMETERS LOCATIONS	Cat.*	All Value in $\mu\text{g}/\text{m}^3$											
		PM ₁₀			PM _{2.5}			SO ₂			NO ₂		
		MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
A1-Near Mine Lease Area	I	40.2	49.3	58.6	18.5	23.0	27.9	4.5	5.7	6.8	6.9	8.2	10.1
A2-Aladipatti Village	R	45.6	58.2	69.6	21.7	27.6	33.1	4.9	6.1	7.2	7.5	8.9	11.2
A3-Kalaiyarkarisalkulam Village	R	39.1	46.0	52.8	17.8	20.9	24.0	4.4	5.6	6.7	7.1	8.4	10.6
A4-Muthuramalingapuram Village	R	39.1	43.8	49.1	18.1	20.2	22.7	4.6	5.8	6.9	6.9	8.6	10.7
A5-Meenashipuram Village	R	42.7	48.6	54.4	19.4	22.1	24.8	4.2	5.4	6.5	6.4	7.7	9.5
NAAQ Limits		PM₁₀			PM_{2.5}			SO₂			NO₂		
	*	100			60			80			80		
	**	100			60			80			80		

***Note:** Category: *- Industrial, Residential, Rural and other area, ** – Ecologically Sensitive Area (notified by Central Government)

Figure 3.9: Ambient Air Quality Data



3.3.2.1 Results and Discussion:

The AAQ monitored data for all locations for above parameters are shown in **Table No - 3.12** and in **Figure No - 3.10**. Ambient Air Quality data during the study period is given in **Annexure-9**. From the table it is seen that, in the ambient air, the PM_{10} values were in the range of 39.1-69.6 $\mu\text{g}/\text{m}^3$. $PM_{2.5}$ values were in the range of 17.8 – 33.1 $\mu\text{g}/\text{m}^3$. SO_2 levels were ranging from 4.2–7.2 $\mu\text{g}/\text{m}^3$. NO_2 levels were ranging from 6.4-11.2 $\mu\text{g}/\text{m}^3$.

The existing Ambient Air Quality levels for PM_{10} , $PM_{2.5}$, SO_2 and NO_2 , are within the NAAQ standards prescribed CPCB limits of 100 $\mu\text{g}/\text{m}^3$, 60 $\mu\text{g}/\text{m}^3$, 80 $\mu\text{g}/\text{m}^3$ & 80 $\mu\text{g}/\text{m}^3$. The CO values in all the locations were found to be below detectable limit. Silica values in the study area are found to be below detectable limit. (Detection limit – 0.05 mg/m^3)

3.3.3 WATER ENVIRONMENT:

Assessment of baseline data on water environment includes Identification of water resources, Collection of water samples and Analyzing water samples collected for physico-chemical parameters as per standards. The water sampling was carried out for 5 locations. Details of the same has been provided below:

Table 3.13: Water Quality Monitoring

1.	Monitoring Period	Summer Season (March 2023 – May 2023)			
2.	Monitoring Location	The location map showing water sampling locations are given in Figure No.3.11.			
	Code	Location	Sample Type	Distance	Direction
	W1	Near Mine Lease Area	Bore Well	-	-
	W2	Aladipatti Village	Borewell	1.7km	NE
	W3	Kalaiyarkarisalkulam Village	Borewell	1.5km	S
	W4	Muthuramalingapuram Village	Borewell	1.9km	SW
	W5	Meenashipuram Village	Borewell	1.3km	N
3.	Methodology	Sampling - IS 3025 Part - I Analysis – IS 3025 relevant parts / APHA 23rd Edition			

DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE, ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.

Figure 3.10: Location of Water Sampling Stations

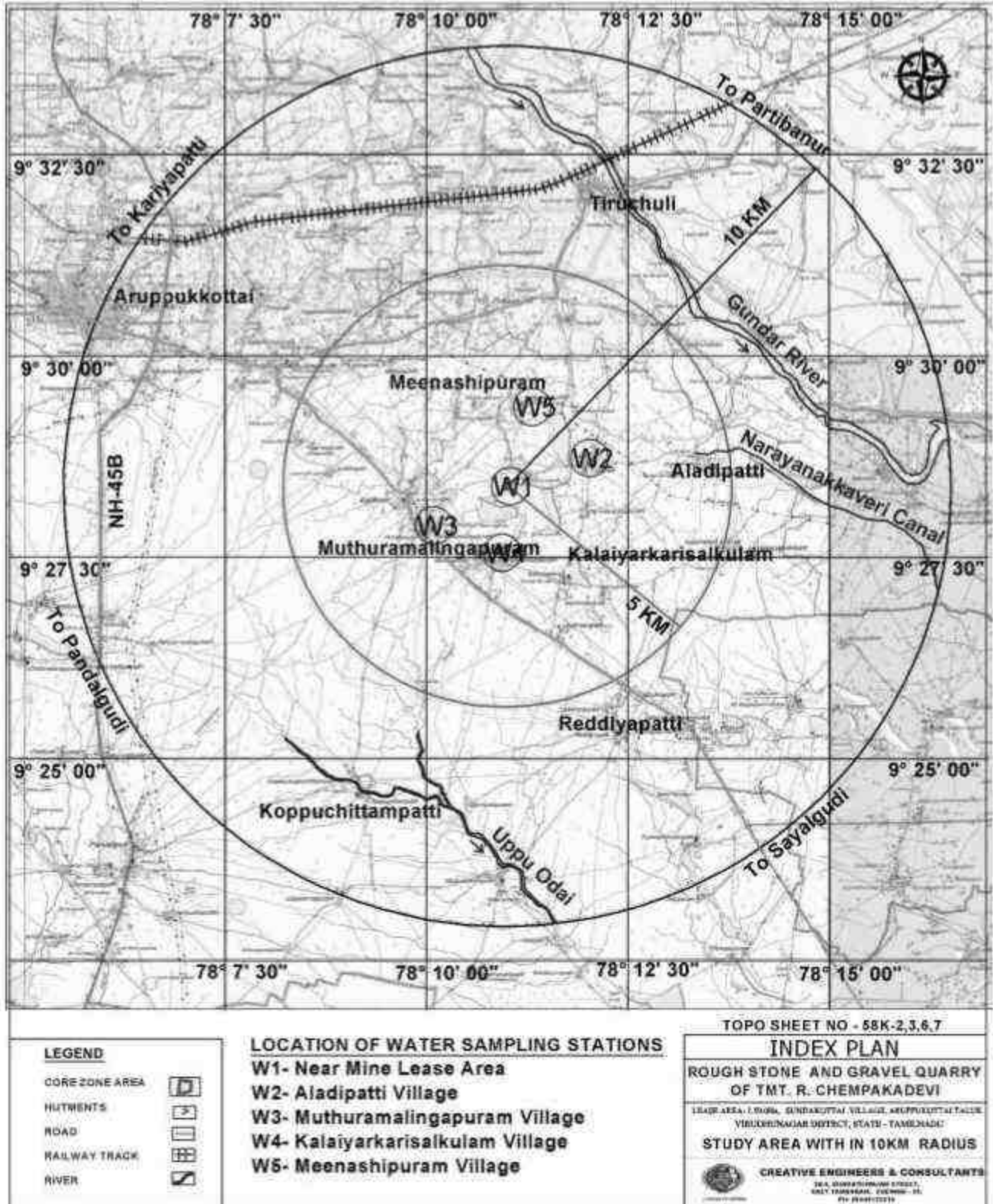


Table 3.14: Summary of Water Quality Data

Season	March 2023 to May 2023	
Monitoring Locations	5 locations	
Parameters	Range of values	Limits*
pH at 25 °C	7.55 – 7.98	6.5-8.5
Total Dissolved Solids, mg/L	328 – 1018	2000
Chloride as Cl ⁻ , mg/L	68.90 – 455	1000
Total Hardness (as CaCO ₃), mg/L	202 – 385	600
Total Alkalinity (as CaCO ₃), mg/L	176– 305	600
Sulphates as SO ₄ ²⁻ , mg/L	24.60 – 220	400
Iron as Fe, mg/L	BDL(D.L.0.01) – 0.06	0.3
Nitrate as NO ₃ , mg/L	BDL(D.L.1.0) – 3.24	45
Fluoride as F, mg/L	0.11 – 0.35	1.5

3.3.3.1 Results and Discussion:

The results of the water sample analysis are shown in **Table No - 3.14**. The pH values were ranging in between 7.55 – 7.98 TDS values were in the range of 328 – 1018mg/L Chloride values were ranging from 68.90 – 455mg/L. Iron content was found to be in the range BDL(D.L.0.01)– 0.06mg/L. The water quality of ground water is found to be within the prescribed Permissible limits of IS: 10500 Norms in the absence of an alternative source as per Drinking Water Specifications. The water quality data is provided in **Annexure-10**.

3.3.4 NOISE ENVIRONMENT:

Opearional phase of this project may lead to increase noise levels from the existing levels at least in and around the project area. As noise level beyond permissible limits will cause adverse impacts on the environment, it has become imperative to assess the noise levels in and around the mine area. Noise level measurements were taken at the 5 locations during the monitoring period. Details of the same are provided below.

**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

Table 3.15: Noise Level Monitoring

1.	Monitoring Period	Summer Season (March 2023 – May 2023)		
2.	Monitoring Location	The location map showing noise monitoring locations are given in Figure No.3.12.		
	Code	Location	Distance	Direction
	N1	Near Mine lease area	-	-
	N2	Aladipatti Village	1.7km	NE
	N3	Kalaiyarkansalkulam Village	1.5km	S
	N4	Muthuramalingapuram Village	1.9km	SW
	N5	Meenashipuram Village	1.4km	N
3.	Methodology	Noise levels were measured using sound level meter manufactured by (Model No - SL- 4001, Make - Lutron). Sound Pressure Level (SPL) measurements were measured at all locations where ambient air quality monitored; one reading for every hour was taken for 24 hours.		
4.	Monitoring Frequency	Once during monitoring period		



DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE, ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.

Figure 3.11: Location of Noise Sampling Stations

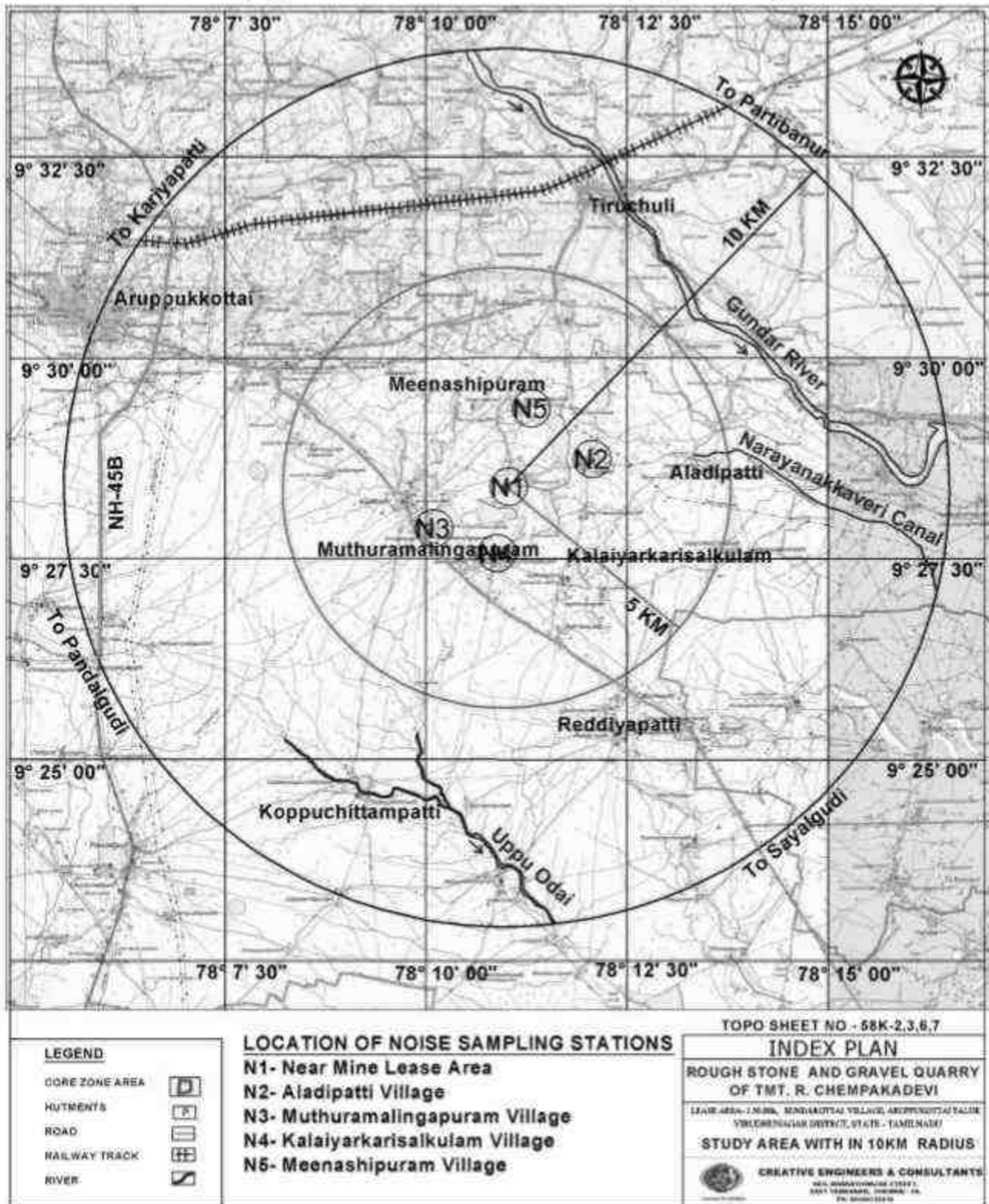
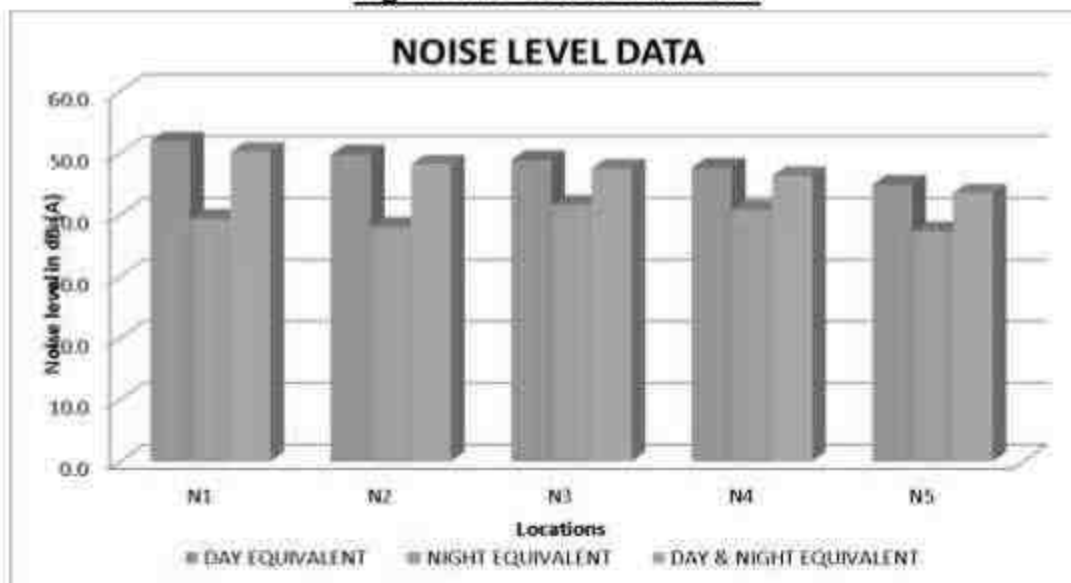


Table 3.16: Ambient Noise Level in dB (A)

Date and time of monitoring	N1	N2	N3	N4	N5
Day Equivalent	51.9	49.8	48.9	47.7	44.9
Night Equivalent	39.4	38.1	41.7	40.9	37.4
Day & Night Equivalent	50.3	48.2	47.5	46.3	43.5

Figure 3.12 Noise Level Data



3.3.4.1 Results and Discussion:

The results of noise levels for all locations are given in **Table No-3.15**. The noise values for all above locations are shown in a comparative chart given in **Figure No - 3.13**. In the buffer zone, day Equivalent Noise (Leq-d) noise levels were ranging from 44.9 dB(A) to 51.9 dB(A) and night Equivalent Noise (Leq-d) levels ranged between 37.4 dB(A) to 41.7 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.

3.3.5 SOIL CHARACTERISTICS:

Soil samples were collected in 3 locations in the core and buffer zone to analyse the physiochemical characteristics of the soil in the area. Elaborate details of the same has been provided below.

**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

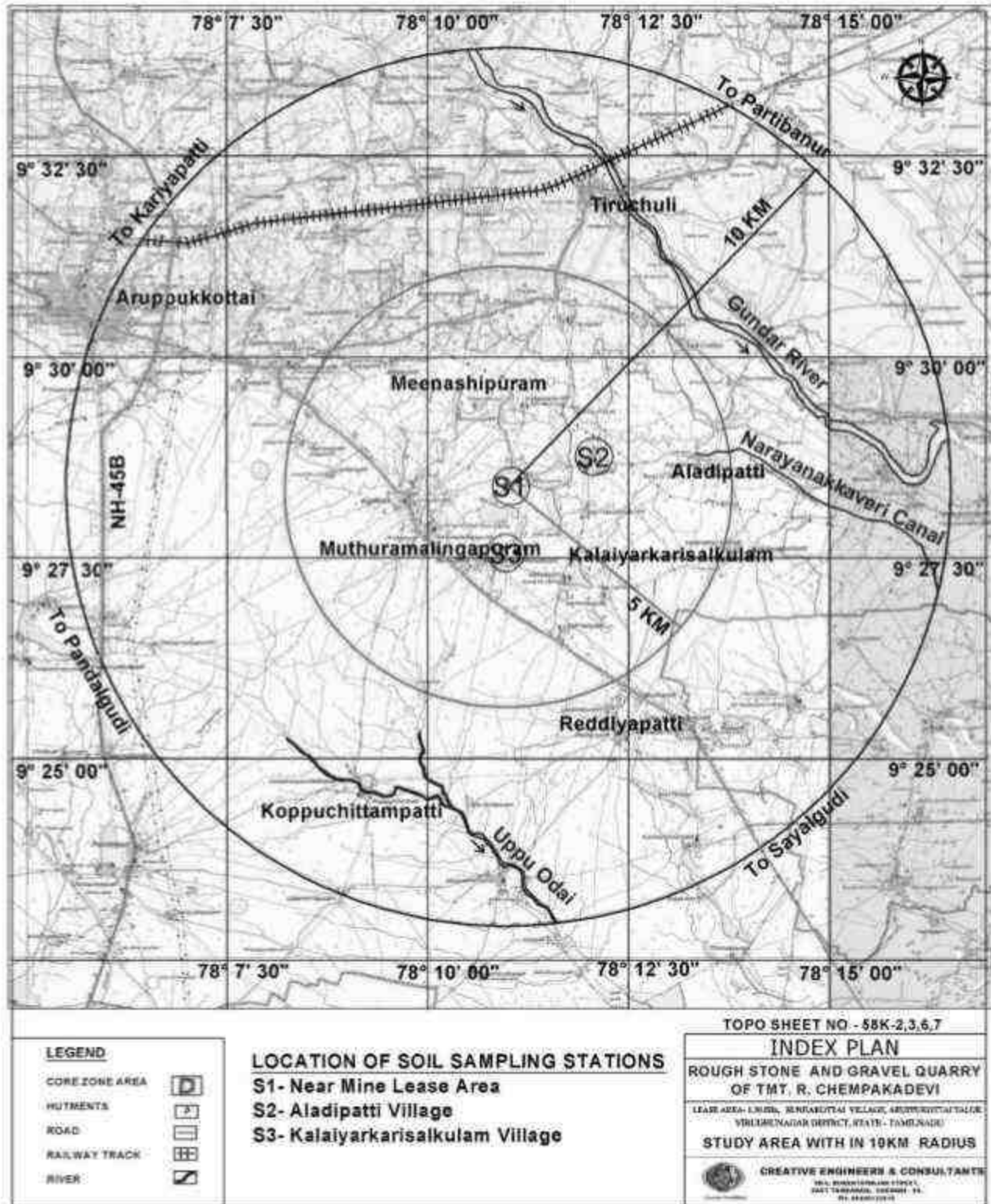
Table 3.17: Soil Quality Monitoring

1.	Monitoring Period	Summer Season (March 2023 – May 2023)		
2.	Monitoring Location	The location map showing soil sampling locations are given in Figure No.3.14.		
	Code	Location	Distance	Direction
	S1	Near Mine lease area	-	-
	S2	Aladipatti Village	1.7km	NE
S3	Kalaiyarkarisalkulam Village	1.5km	S	
3.	Methodology	Composite soil samples using sampling augers and field capacity apparatus.		
4.	Monitoring Frequency	Once during monitoring period		



DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE, ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.

Figure 3.13: Location of Soil Sampling Stations



DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE, ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.

Table 3.18: Soil Quality Data

S.No	Parameters	Unit	S1	S2	S3
1	pH at 25°C	-	7.46	7.05	6.98
2	Electrical Conductivity	(µmhos/cm)	170.5	148.6	102.7
3	Dry matter content	%	97.58	98.64	98.75
4	Water Content	%	2.42	1.36	1.25
5	Organic Matter	%	1.32	1.45	1.72
6	Soil texture	-	Silt loam	Silt loam	Silt loam
7	Grain Size Distribution	%			
	i. Sand		40.25	37.98	34.24
8	ii. Silt	%	51.48	53.47	50.66
9	iii. Clay	%	8.27	8.55	15.1
10	Phosphorous	µg/g	1.42	1.66	1.54
11	Sodium	mg/kg	215	240	256
12	Potassium	mg/kg	768	652	590
13	Total Nitrogen	mg/kg	748	590	634
14	Total Sulphur	%	BDL(D.L - 0.02)	BDL(D.L - 0.02)	BDL(D.L - 0.02)
15	Water Holding Capacity	-	3.6	3.8	4.2
16	Porosity	-	20.5	22.6	20.7

3.3.5.1 Results and Discussion:

Results of the soil samples show that the pH values were ranging between 6.98 to 7.46 and Electrical Conductivity values were ranging between 102.7 – 170.5 µmhos/cm. Soils are generally Silty loam type. Organic matter values were ranging between 1.32 – 1.72%. Total Nitrogen values were ranging between 590 - 748mg/kg. Phosphorus values were ranging between 1.42 – 1.66µg/g. Potassium values were ranging between 590 - 768 mg/kg. Sodium values were ranging between 215- 256 mg/kg. Total Sulphur values were observed to be BDL. The soil quality data for the 3 samples collected and analyzed are provided in **Table No – 3.18.**



3.4 LAND ENVIRONMENT - LANDUSE & LAND COVER

For preparing an impact statement, aspects of the land conditions are covered under land use. An industrial project / mine can cause changes in land use, soil process in different intensities depending upon the size of the project and distance involved between the industries and the area. Here, land use status for a radius of 10 km has been studied.

3.4.1 DATA USED AND METHODOLOGY

For the present study on land use pattern of buffer area around the proposed stone and gravel quarry, an archived historical data of Landsat-8 data shas been used as base data acquired on April 2023 (Figure No.3.14) has been used to generate the require landuse map showing their spatial pattern within the buffer area. The table showing data used for generation of information on landuse and subsequent GIS analysis is given below

Table 3.19: RS satellite image used for the present study

S.No	Type of Data	Date	Generated Map
1.	Landsat-8	Apr 2023	Landuse (LU) Map showing 10 Km around the ML area

Interpretation of satellite image requires understanding of relationship between image elements and their respective terrain elements. Since, in the present study, the landuse information is obtained using visual interpretation, an interpretation key is generated. The image elements such as color, tone, texture, size, shape and associated elements have been used to delineate various landuse categories. The landuse categorization and nomenclature used in the present study is based on the national level landuse classification system, which is adopted for the entire country as recommended by National Remote Sensing Centre (NRSC), Department of Space, Government of India.

Figure 3.14 Landsat 8 Satellite Data of the Study Area

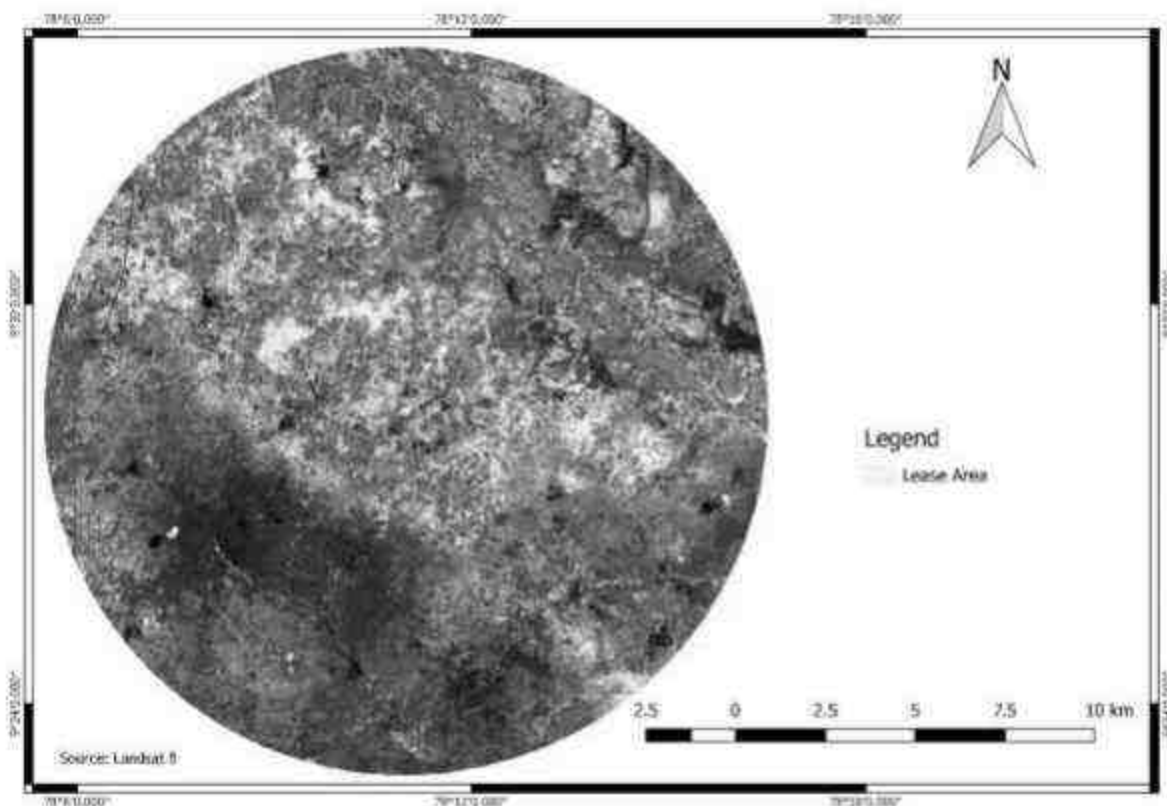


Table 3.20: Major Landuse Units of the Study Area

S.No	Major Category	Landuse unit
1	Built-Up Land	Village, Town, Industrial / Vacant Area
2	Agricultural Land	Crop Land Fallow Land Plantation Farm Land
3	Forest Land	Open Scrub Forest
4	Waste Land Mining Area	Land With Scrub/ Land Without Scrub Barren Rocky/ Stony Waste Quarries / Abandoned Quarries
5	Waterbodies	Tanks/ Rivers / Streams

Such LandUse and Land cover (LULC) categories have been verified using field check and identified sample sites within the buffer area, verified on field and transferred into gis geo-coordinates using observation coordinates received from hand held GPS (global positioning system) instrument. Thus, an interpreted final landuse map has been generated (Figure No. 3.15) using above such elaborate procedure and transformed into GIS environment for its spatial distribution and area estimation. Spatial nature and extent of various landuse categories within the buffer area is discussed is given below:

DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE, ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.

Figure 3.15: Map Showing Land Use Categories around 10km Buffer

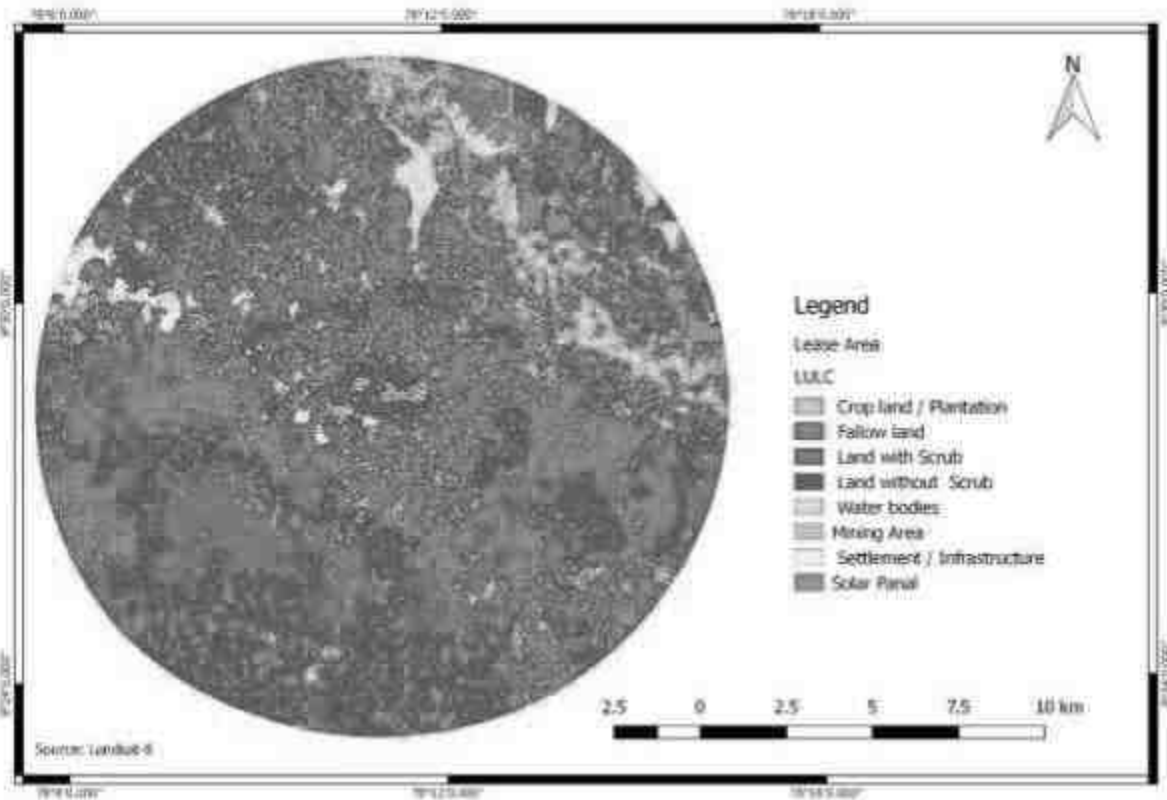


Table 3.21: Area Estimation of Landuse Categories in Buffer Zone

S.No	Landuse Feature	Area (Sq.Km)	Percentage
1	Agriculture/ Plantation	41.73	13.25
2	Fallow Land	154.63	49.12
3	Land With Scrub	73.03	23.20
4	Land Without Scrub	27.77	8.82
5	Water bodies	5.81	1.85
6	Mining Area/ Industries	5.05	1.61
7	Settlement	4.32	1.37
8	Solar panel	2.47	0.79
	Total	314.81	100

From the above table it is seen that 13.25 % of the study area is agriculture land and 49.12 % are fallow land. Land with scrub constitutes 23.20 %, lands without scrub constitute 8.82 % and waterbodies & others constitute 5.62 %.

3.4.2 LAND USED BASED ON REVENUE RECORDS:

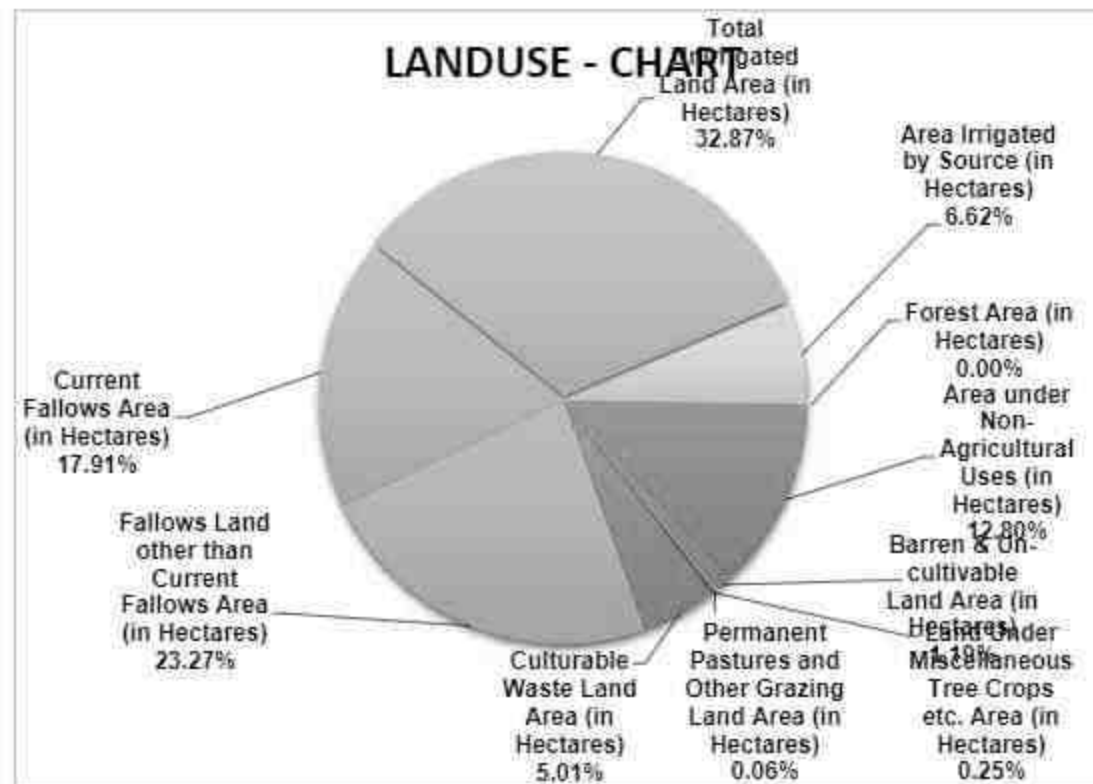
The lease area falls in Sundakottai village, Aruppukottai Taluk, Virudhunagar District, Tamil Nadu state and the study area for the land use pattern (10 km radius) has been divided into four zones viz. Zone-I (0-2 km), Zone-II (2-5 km), Zone-III (5-10 km) and Zone-IV (0-10 km) respectively. The land use pattern of the study area falling within 10 km radius around the proposed project area is presented in Table no - 3.19. Village wise land use pattern is provided in **Annexure-11**.

DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE, ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.

Table 3.22: Land Use Pattern of the Study Area Falling Within 10 Km Area in (Ha)

Study Area	Total Geographical Area	Forest Area	Area under Non-Agricultural Uses	Barren & Un-cultivable Land Area	Permanent Pastures and Other Grazing Land Area	Land Under Miscellaneous Tree Crops etc. Area	Culturable Waste Land Area	Fallows Land other than Current Fallows Area	Current Fallows Area	Total Un irrigated Land Area	Area Irrigated by Source
0- 2 KM	804.37	0	109.39	12	0	0	0.5	295.65	36.71	214.28	135.84
2 - 5 KM	8726	0	1078.12	56.64	0	46.06	44.78	2567.48	1115.14	3185.2	632.58
5-10 KM	28159.61	0	3638.46	379.43	23.89	47.6	1844.83	5908.83	5600.05	8988.92	1727.6
0-10 KM	37689.98	0	4825.97	448.07	23.89	93.66	1890.11	8771.96	6751.9	12388.4	2496.02

Figure 3.16: Landuse within the Buffer Zone Area



3.5 BIOLOGICAL ENVIRONMENT:

Study of the biological environment of any area comprises of well-planned ecological survey for the floristic and faunal composition of the areas through various scientifically planned techniques. Accordingly the ecological survey for the proposed quarry area including core and buffer zone were carried out to identify various species occurring in the area.

3.5.1 FLORA:

An ecological survey of the study area was conducted with reference to listing of species and assessment of the existing baseline ecological conditions. The objective of the survey is as follows:

- ❖ Generate existing data from field observations of various terrestrial floristic occurrences.
- ❖ Collect secondary data from Government records as well as through discussion with Forest officials, knowledgeable public etc.,
- ❖ Compare the data with authentic past records to identify changes, if any.
- ❖ Identify the impact of project operations on the biological aspects.

To accomplish the above objectives, a general ecological survey covering an area of 10 km radius was conducted. The locations were identified for phyto-sociological aspects to assess the current status.

3.5.1.1 Sampling Methodology:

In order to provide representative ecological status for the study area, the 10-km radius buffer area has been divided into four quartiles for biodiversity sampling, i.e., NE (Q-1), NW (Q-2) SW (Q-3) and SE (Q-4). Each of the quartiles have been examined for representative flora on randomly sampled quadrats for trees (10x10 m), shrubs (5x5 m) and herbs (1x1 m) depending upon prevailing geographical conditions and bio-diversity aspects of study area.

Phyto-sociological Survey: Phyto-sociological parameters, viz., Abundance (i.e., density), average and minimum stems were measured to determine the distribution and ecological aspects of the species. Abundance is a measure of the density of distribution of an individual species within a given area. It is calculated by summed individuals of a species. Average species number is calculated for all quadrates; similarly, minimum number of individuals represented is recorded

at quadrats level. A total of 10 quadrats were laid down in core area and a total of 20 quadrats were laid out in four quartiles (5 each) of buffer area.

Quadrats method for flora : Quadrats of 10 × 10m were laid down randomly within core and 10kms buffer area, each quadrat was laid to assess the trees (>5 cm GBH) and 5 × 5 m sub-quadrat nested within the quadrat for shrubs and two plot 1 × 1 m for herbs . The quadrats were laid at a minimum distance of a kilometer apart to maximize the sampling efforts and minimize the species homogeneity, such as small stream area, trees in agricultural bunds, tank bunds, farm forestry plantations, natural forest area, avenue plantations, house backyards, etc. In each sample quadrate, individuals belonging to tree, shrub and herb species were recorded separately, and have been identified on the field. The prevailing land use and habitat quality has been noted down for each location on the field.

Vegetation Analysis using index: Species diversity will be calculated by using Shannon and Wiener (1963) formula as follows:

$$H' = - \sum_{i=1}^R p_i \ln p_i$$

Whereas,

H' is Shannon index of general diversity,

P_i is often the proportion of individuals belonging to the i th species in the dataset of interest.

Evenness index was calculated as: $E = H'/H_{max}$,

Whereas $H_{max} = \log_2$ (number of species in the plot)

A.CORE ZONE:

The lease area is a non-forest, private land. Major part of lease area is barren fallow land with bushes (*Prosopis juliflora*) and grasses. The detailed list of plants found in the core zone are given in Table no – 3.20.

**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

Table 3.23: List of Floristic Species in the Core Zone

Sl.No	Species Name	Common Name	Family
Trees			
1	<i>Acacia leucophloea</i>	Fabaceae	Valvelam
2	<i>Azadirachta indica</i>	Meliaceae	Vembu
3	<i>Morinda pubescens</i>	Rubiaceae	Manjanathi
4	<i>Prosopis juliflora</i>	Fabaceae	Cimaikkaruvel
5	<i>Acacia nilotica</i>	Fabaceae	Karuvelan
6	<i>Morinda tinctoria</i>	Rubiaceae	Nuna
Shrubs			
1	<i>Lantana camara</i>	Verbenaceae	Uni
2	<i>Ziziphus jujuba</i>	Rhamnaceae	Elanthai
3	<i>Cassia auriculata</i>	Fabaceae	Aavarampoo
4	<i>Calotropis gigantea</i>	Apocynaceae	Earukku
Herbs			
1	<i>Anisomeles indica</i>	Lamiaceae	marutti
2	<i>Acalypha indica</i>	Amaranthaceae	Kupaimeni keeri
3	<i>Solanum nigrum</i>	Solanaceae	Manathakkali
4	<i>Leucas aspera</i>	Lamiaceae	Thumbai
5	<i>Tridax procumbens</i>	Asteraceae	Vettukai poondu
6	<i>Sida acuta</i>	Malvaceae	Palambasi
Grasses			
1	<i>Cyperus rotundus</i>	Cyperaceae	Korai pullu
2	<i>Cynodon dactylon</i>	Poaceae	Arugampillu

DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE, ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.

C.BUFFER ZONE:

The Dominated species are *Prosopis juliflora*, *Azadirachta indica*, *Borassus flabellifer*, *Acacia nilotica*, *Albizia lebbek*, *Acacia leucophloea*, *Acacia auriculiformis*, etc. The detailed list of plants found in the Bufferzone is given in Table no – 3.25.

Table 3.24: List of Floristic Species in the Buffer Zone

Sl.No	Species Name	Family	Local Name
Trees			
1	<i>Phyllanthus emblica</i>	Euphorbiaceae	Nelli
2	<i>Delonix regia</i>	Fabaceae	Gulmohar
3	<i>Azadirachta indica</i>	Meliaceae	Vembu
4	<i>Carica papaya</i>	Caricaceae	Pappali
5	<i>Cocus nucifera</i>	Arecaceae	Tennai
6	<i>Ficus benghalensis</i>	Moraceae	Aalamaram
7	<i>Gmelina arborea</i>	Lamiaceae	Kumalaamaram
8	<i>Ficus religiosa</i>	Moraceae	Poarasamaram
9	<i>Cassia fistula</i>	Fabaceae	Konrai
10	<i>Citrus limon</i>	Rutaceae	Lemon
11	<i>Casuarina equisetifolia</i>	Casuarinaceae	Savukku
12	<i>Manilkara zapota</i>	Sapotaceae	Sappota
13	<i>Madhuca longifolia</i>	Sapotaceae	Iluppai
14	<i>Mimusops elengi</i>	Sapotaceae	Magizhamboo
15	<i>Acacia auriculiformis</i>	Fabaceae	Pencil tree
16	<i>Prosopis juliflora</i>	Fabaceae	Seemai karuvel
17	<i>Thespesia populnea</i>	Malvaceae	Puvarasu
18	<i>Mangifera indica</i>	Anacardiaceae	Maamaram
19	<i>Morinda tinctoria</i>	Rubiaceae	Nuna
20	<i>Polyalthia longifolia</i>	Annonaceae	Nietilingam
21	<i>Borassus flabelliformis</i>	Arecaceae	Panna-maram
22	<i>Moringa oleifera</i>	Moringaceae	Murungai
23	<i>Syzygium cumuni</i>	Myrtaceae	Naval
24	<i>Musa paradisiaca</i>	Musaceae	Valzhlai
25	<i>Pithecellobium dulce</i>	Fabaceae	Kodukkapuli
26	<i>Pongamia pinnata</i>	Fabaceae	Pungai
27	<i>Psidium guava</i>	Myrtaceae	Koyya
28	<i>Peltophorum pterocarpum</i>	Fabaceae	Kilukiluppai
29	<i>Samanea saman</i>	Fabaceae	Amaivagai
30	<i>Tamarindus indica</i>	Fabaceae	Puli
31	<i>Acacia leucophloea</i>	Fabaceae	Valvelam
32	<i>Bobax ceiba</i>	Malvaceae	Ilavu
33	<i>Bauhinia purpurea</i>	Caesalpiniaceae	Mantharai
34	<i>Leucaena leucocephala</i>	Fabaceae	Subabul
35	<i>Morinda pubescens</i>	Rubiaceae	Manjanathi
36	<i>Albizia lebbek</i>	Fabaceae	Vagai



DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE, ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.

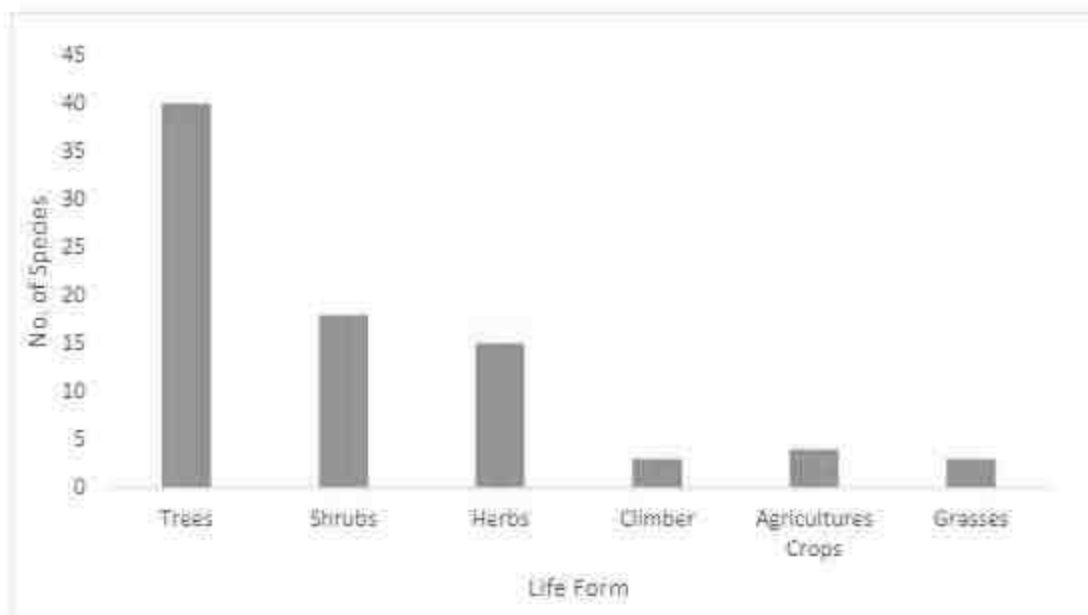
Sl.No	Species Name	Family	Local Name
37	<i>Terminalia arjuna</i>	Combretaceae	Marudha Maram
38	<i>Acacia nilotica</i>	Fabaceae	Karuvelan
39	<i>Tectona grandis</i>	Verbenaceae	Tekku
40	<i>Aegle marmelos</i>	Rutaceae	Vilvamaran
Shrubs			
1	<i>Justicia adhatoda</i>	Acanthaceae	Adathoda
2	<i>Ipomoea carnea</i>	Convolvulaceae	Pink morning glory
3	<i>Boerhaavia diffusa</i>	Nyctaginaceae	Kagithapoo
4	<i>Aloe vera</i>	Asphodelaceae	Chotthu kathalai
5	<i>Hibiscus rosa-sinensis</i>	Malvaceae	Semparuthi
6	<i>Jatropha glandulifera</i>	Euphorbiaceae	Vellaikattukottai
7	<i>Nerium indicum</i>	Apocynaceae	Arali
8	<i>Lawsonia inermis</i>	Lythraceae	Maruthani
9	<i>Ziziphus jujuba</i>	Rhamnaceae	Elanthai
10	<i>Vitex negundo</i>	Verbinaceae	Vanili
11	<i>Ricinus communis</i>	Euphorbiaceae	Amanakku
12	<i>Lantana camara</i>	Verbenaceae	Putus
13	<i>Cassia auriculata</i>	Fabaceae	Aavarampoo
14	<i>Calotropis gigantea</i>	Apocynaceae	Earukku
15	<i>Tecoma stans</i>	Bignoniaceae	Yellow trumpetbush
16	<i>Ixora csei</i>	Rubiaceae	Idlipoo
17	<i>Sida cordifolia</i>	Malvaceae	Sida plant
18	<i>Abutilon indicum</i>	Malvaceae	Thuthi
Herbs			
1	<i>Cleome viscosa</i>	Cleomaceae	Naai velai
2	<i>Anisomeles indica</i>	Lamiaceae	marutti
3	<i>Tidax procumbens</i>	Asteraceae	Vettukai poondu
4	<i>Anisomeles malabarica</i>	Lamiaceae	Peyimarutti
5	<i>Solanum xanthocarpum</i>	Solanaceae	Kandangkattari
6	<i>Argemone mexicana</i>	Papaveraceae	Mexican poppy
7	<i>Sida rhombifolia</i>	Malvaceae	Kurundotti
8	<i>Acalypha indica</i>	Amaranthaceae	Kupaimeni keeri
9	<i>Sida acuta</i>	Malvaceae	Palambasi
10	<i>Phyllanthus niruri</i>	Phyllanthaceae	Keelzhaneeli
11	<i>Parthenium hysterophorus</i>	Asteraceae	Parthenium
12	<i>Leucas aspera</i>	Lamiaceae	Thumbai
13	<i>Ocimum tenuiflorum</i>	Lamiaceae	Thulasi
14	<i>Achyranthes aspera</i>	Amaranthaceae	Nayuruvi
15	<i>Acanthospermum hispidum</i>	Asteraceae	Gokul kanta
Climber			
1	<i>Cissus quadrangularis</i>	Vitaceae	Pirandai
2	<i>Abrus precatorius</i>	Fabaceae	Kundumani
3	<i>Asparagus racemosus</i>	Asparagaceae	Tannir-vittan
Agricultures Crops			
1	<i>Musa paradisiaca</i>	Musaceae	Valzhai



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Sl.No	Species Name	Family	Local Name
2	<i>Solanum melongena</i>	Solanaceae	Kaththani
3	<i>Sesbania grandiflora</i>	Fabaceae	Agati
4	<i>Gossypium hirsutum</i>	Malvaceae	Paruththi
Grasses			
1	<i>Cyperus rotundus</i>	Cyperaceae	korai pullu
2	<i>Chloris barbata</i>	Poaceae	Kodai pullu
3	<i>Cynodon dactylon</i>	Poaceae	Arugampillu

Figure 3.17: Flora species in the Buffer Zone



3.5.2 FAUNA:

Methodology: Both direct and indirect observation methods were used to survey the fauna. Point Survey Method was used to study the Bird diversity. Besides, discussion with local villagers Collection secondary data from Government records, published reports as well as through discussion with Forest officials, knowledgeable public were used for the study.

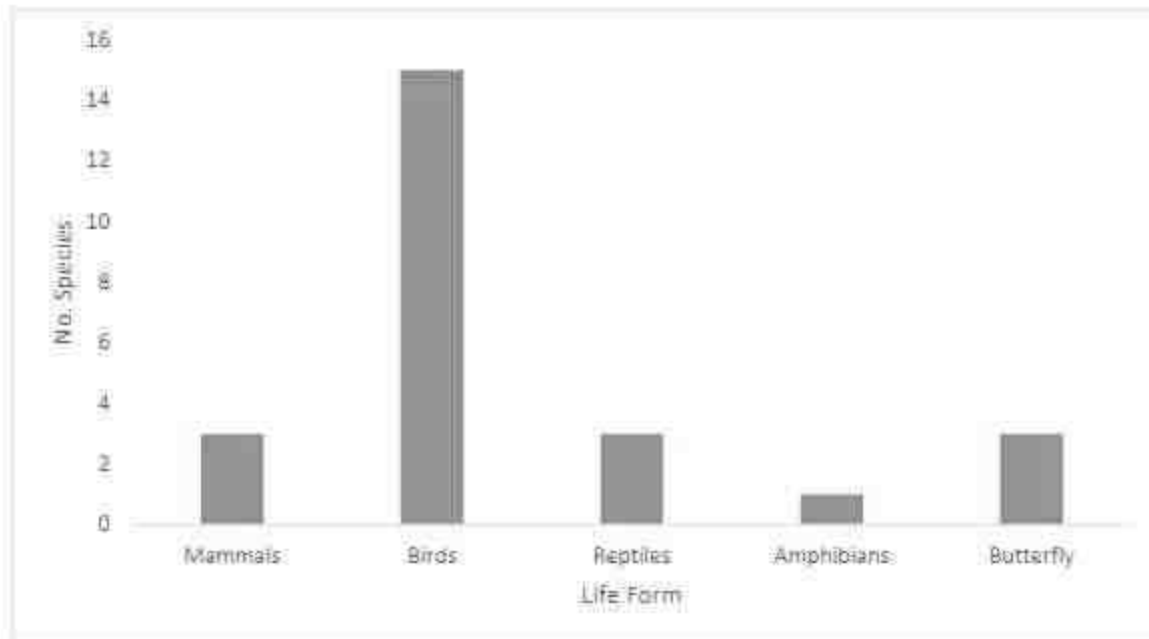
Observation: There is no Wild Life Sanctuary or National Park within the study area of 10 km. Domesticated animals are commonly found. The lease and 10 Km buffer zone does not fall in the Western Ghats ESA boundary. No wild mammalian species was directly sighted during the field survey. There is no Schedule I animals in the buffer zone area. The list of fauna within the study area is given in Table No – 3.26.

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Table 3.25: List of Fauna in the Buffer Zone

S.No	Common Name	Scientific name	IWPA Schedule
Mammals			
1	Indian Palm squirrel	Funambus palmarum	IV
2	Indian Grey Mongoose	Herpestes edwardsii	II
3	Common Indian Hare	Lepus ruficaudatus	IV
Birds			
1	Spotted Dove	Streptopelia chinensis	IV
2	Common Kingfisher	Alcedo atthis	IV
3	Common Myna	Acridotheres tristis	IV
4	Rose-ringed Parakeet	Psittacula krameri	IV
5	House Sparrow	Passer domesticus	IV
6	Black Drongo	Dicrurus macrocercus	IV
7	Common Crow	Corvus splendens	V
8	Red-vented Bulbul	Pycnonotus cafer	IV
9	Indian Cuckoo	Cuculus micropterus	IV
10	Little Cormorant	Phalacrocorax niger	IV
11	Purple-rumped Sunbird	Nectarinia zeylonica	IV
12	Little Egret	Egretta garzetta	IV
13	Common Quail	Coturnix coturnix	IV
14	Cattle Egret	Bubulcus ibis	IV
15	Common Babbler	Turdoides caudatus	IV
Reptiles			
1	Garden Lizard	Calotes versicolor	IV
2	Rat Snake	Ptyas mucosa	II
3	Common Indian krait	Bungarus caeruleus	II
Amphibians			
1	Common Indian toad	Bufo melanostictus	IV
Butterfly			
1	Small grass yellow	Eurema brigitta	IV
2	Lime butterfly	Papilio demoleus	IV
3	Common crow	Euploea core	IV

Figure 3.18: Fauna Diversity in the Buffer Zone



3.6 HYDROGEOLOGICAL STUDY:

This section delves into the study of the hydrogeological scenario of the study area to evaluate the impact of mining activities on the nearby areas. The study area is located in Sundakottai Village, Aruppukottai Taluk is considered to understand the nature of the general hydrogeological conditions of the area.

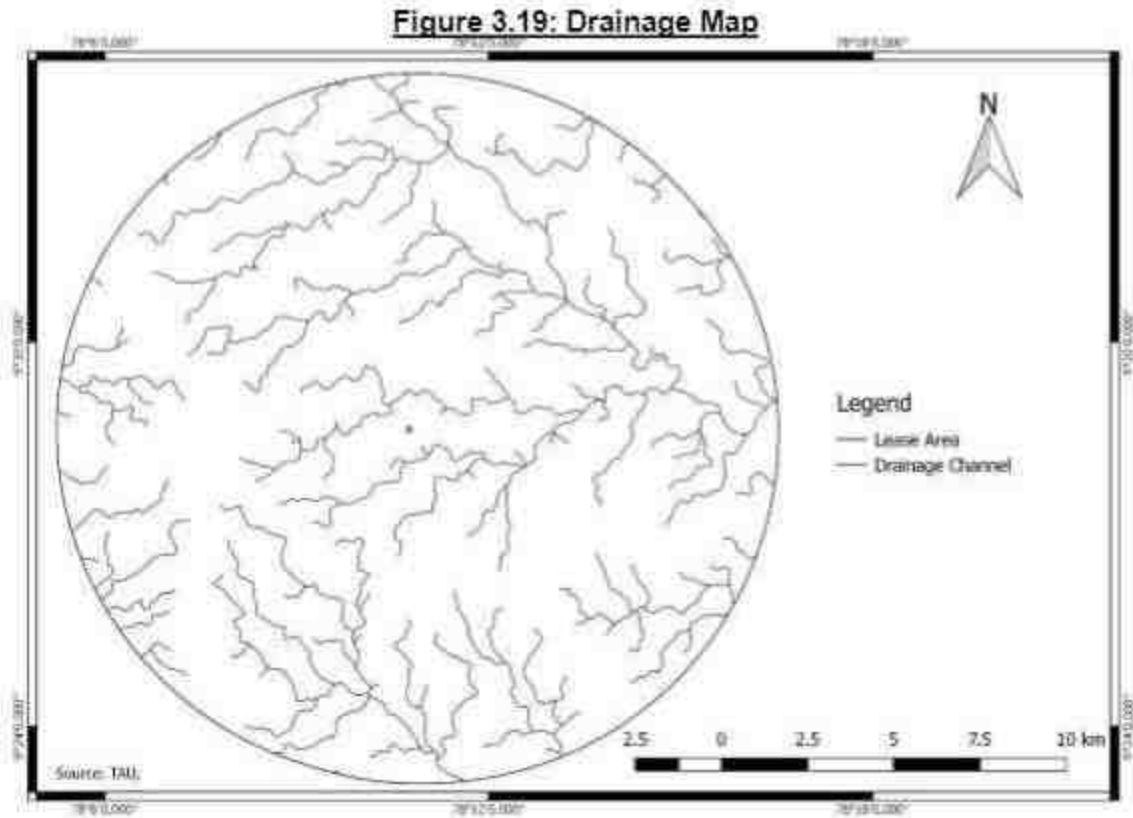
3.6.1 PHYSIOGRAPHY AND DRAINAGE:

Physiography: The The rocks in this area belonging to archean group of rocks. Below the Gravel formation a hard Rough stone Charnockite are noted. The rocks are Phaneric to medium grained nature. And in these rocks there are mineral constituents of Blue Quartz, Micro Cline Feldspar, Hypersthene and flacks of Biotite Mica. The rocks are striking towards North – South direction dipping 80° Vertical towards East direction.

Drainage: There is a drainage channel on the southern side of the lease area for which safety distance of 10m has been left.

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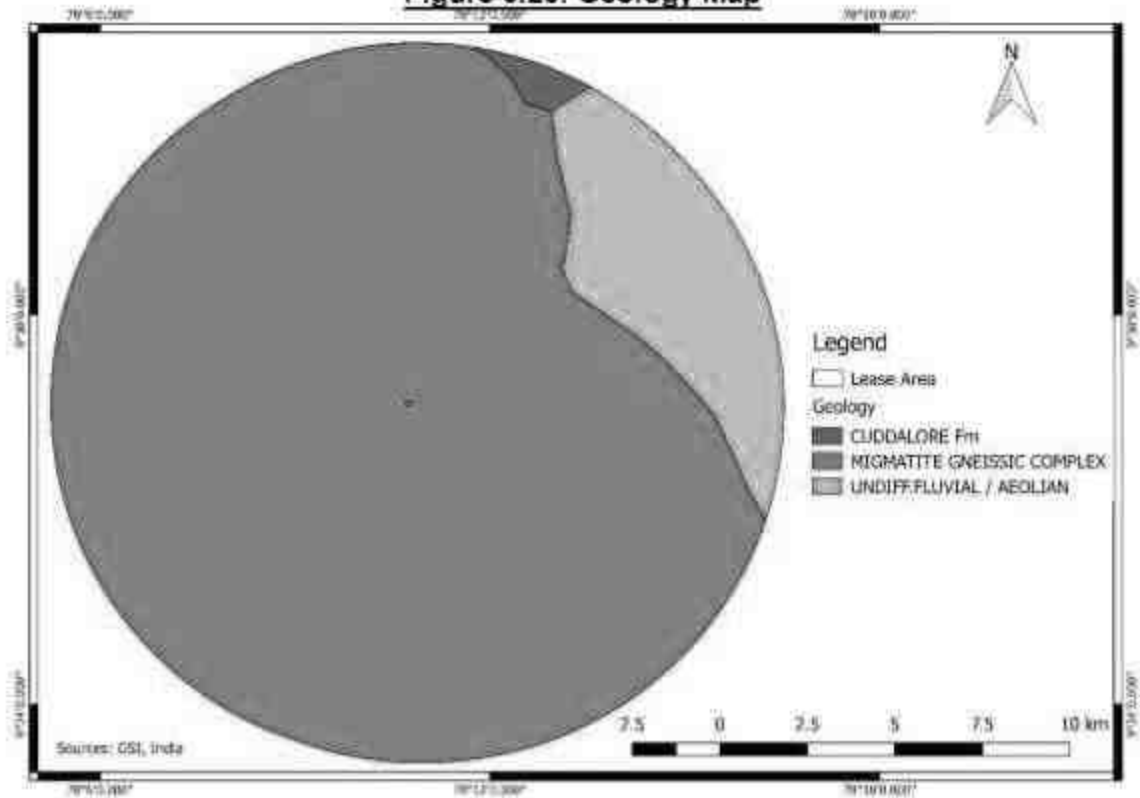
The drainage map prepared from the survey of India topographic maps shows the presence of few streams running in a dendritic pattern.



3.6.2 GEOLOGY AND GEOMORPHOLOGY

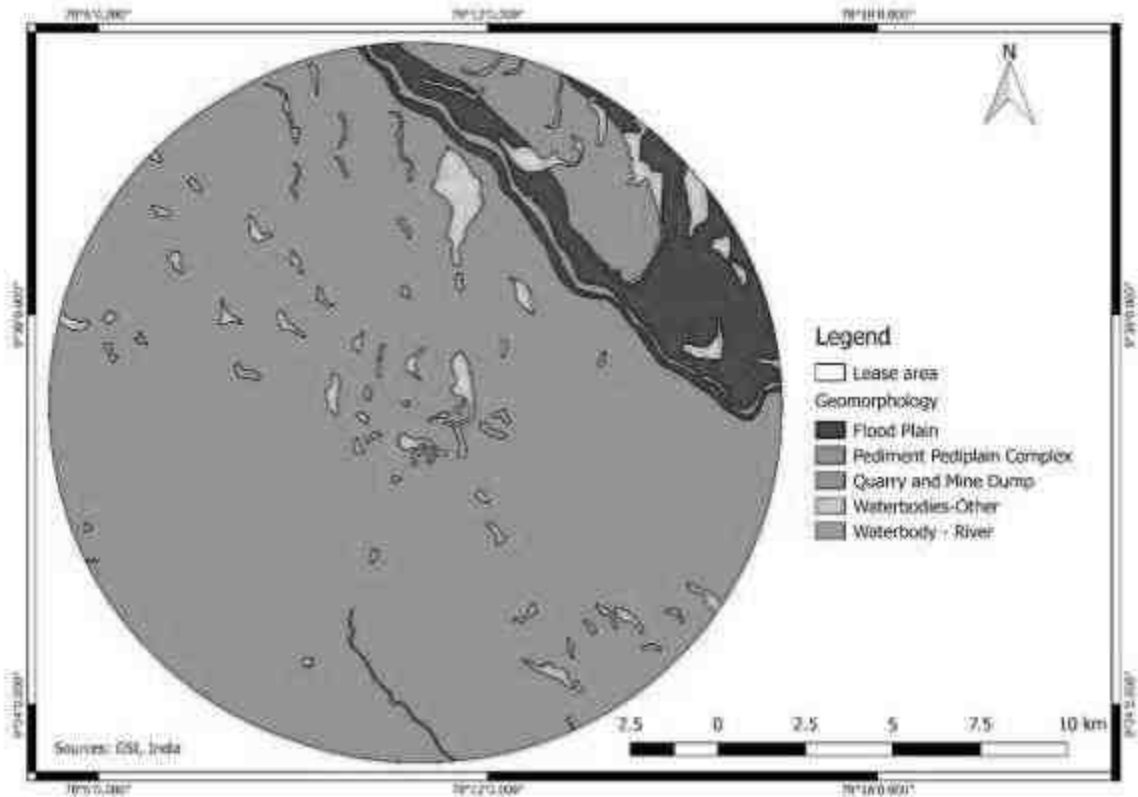
Geology: The type of rock formation in the core and buffered zone is composed majority of Migmatite Gneissic complex. The lease area falls under Migmatite Gneissic complex category.

Figure 3.20: Geology Map



Geomorphology: The geomorphology map of the study derived from the satellite imagery using remote sensing and GIS technique. Predominantly the buffer zone is dominated by Pediment Plain complex, and it is the same category that the lease area also falls under.

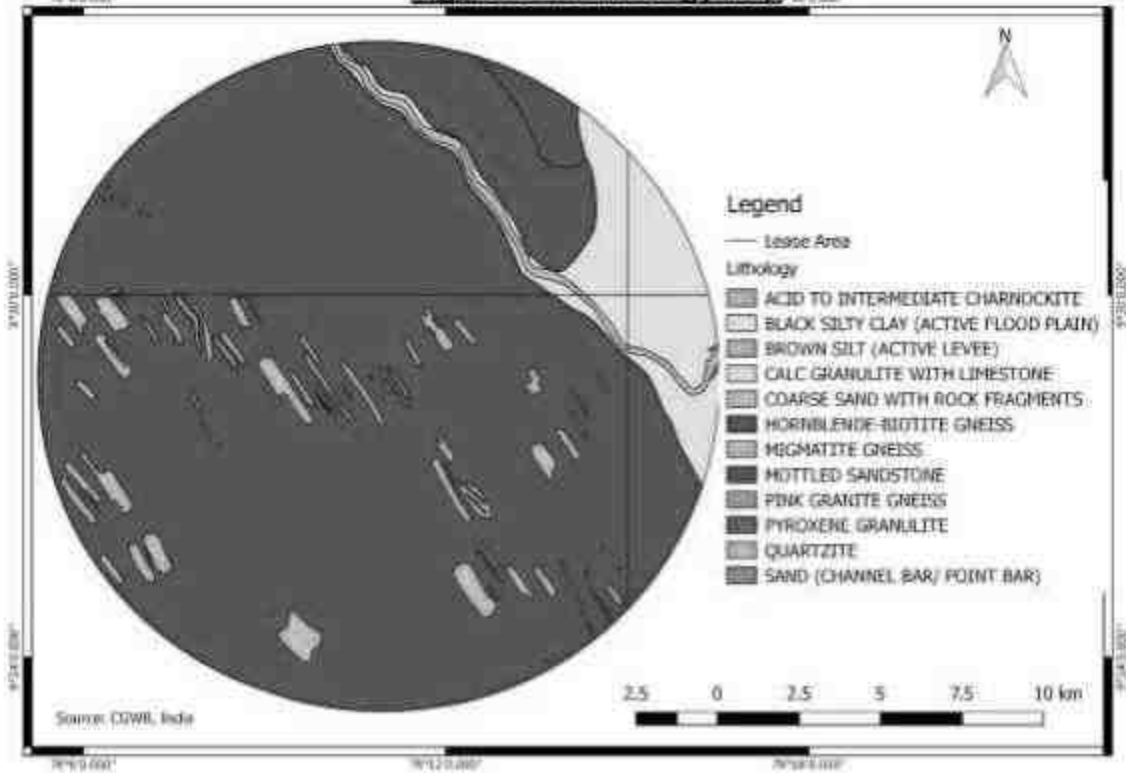
Figure 3.21: Geomorphology Map



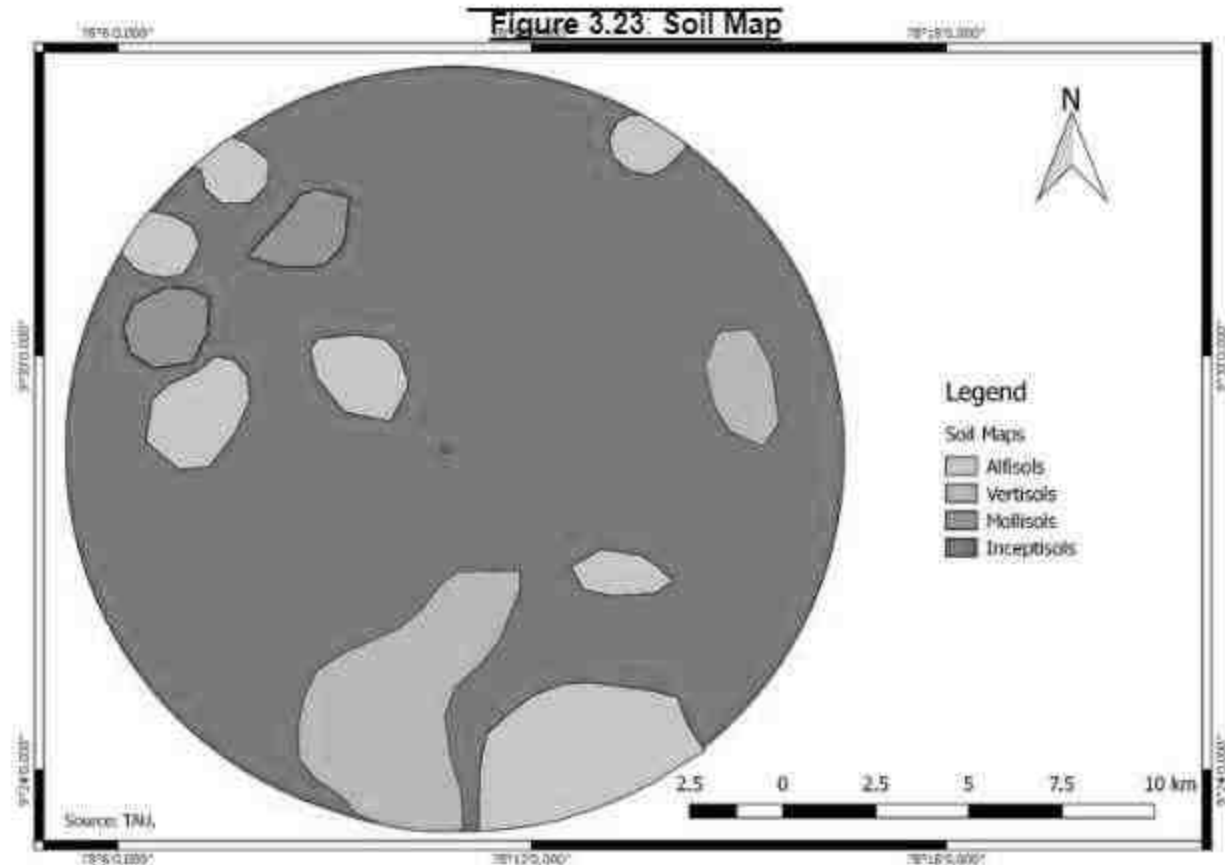
Lithology: The study area is mainly dominated by Hornblende-Biotite Gneiss. The lithology map has been provided below.

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Figure 3.22 Lithology Map



Soil: The study area is characterized by Inceptisol, Alfisols, Vertisols and Entisols. The project area is dominated with Inceptisol type of soil.



3.6.3 WATER TABLE OF THE AREA:

Based on the depth to water level data obtained from the India-WRIS, Department of Water Resources, Ministry of Jal Shakti for Aruppukottai Block, Viruthunagar District, Tamil Nadu the following is observed.

Table 3.26: General Trend of Depth to Water Level for Aruppukottai Block

Year	Depth to Water Level (m bgl)		Wells Monitored	
	Pre-Monsoon	Post-Monsoon	Pre-Monsoon	Post-Monsoon
2015	11.4	3.25	2	2
2016	5.76	5.66	3	3
2017	-	8.21	-	3
2018	7.82	5.00	3	2
2019	3.35	4.7	1	1

The premonsoon and post monsoon water levels are depicted in Figure No.3.25, and 3.26 and they indicate that the depth to water level in project area ranges between 5.0 to 10.0 m bgl during the pre-monsoon season(April) and 0.0 to 5.0 m bgl during the post monsoon season (November).

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Figure 3.24: Pre-Monsoon Water Level

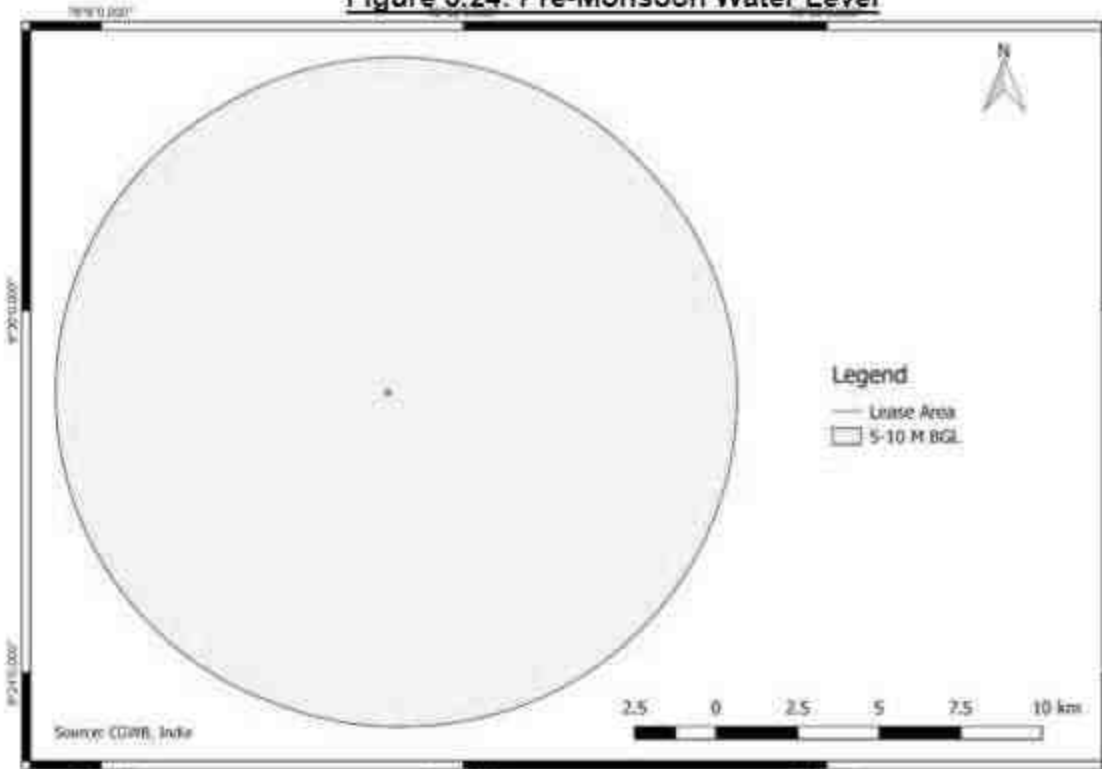
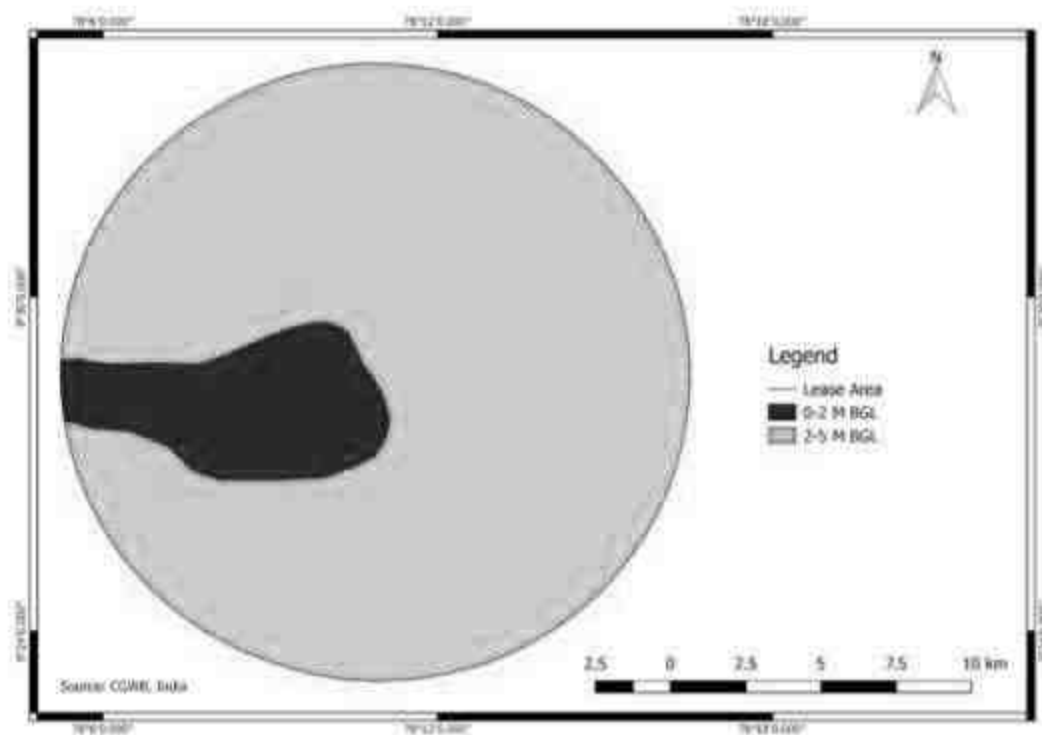


Figure 3.25: Post Monsoon Water Level



Field investigation:

Study of the area shows that the sub-surface formations reveal about 1 to 2m of soil with low recharge potentials. Subsequently hard and massive formations of rock are found.

In the study area, the shallow aquifer is developed through dug wells and deeper aquifer through tube wells. The study has revealed that potential fractures are encountered at deeper levels. The water in the wells are available mainly after post monsoon and it reduces during summer necessitating only dry crops cultivation. Bore wells are as deep as 600 ft also and it reflects that the yield is only better at deeper water levels.

Based on the available information and the geophysical investigations it is concluded that the project area is considered to poor groundwater potential up to 50m. Besides, the mining area consists of hard compact rock, no major water seepage within the mine is expected. There is no water seepage noticed in to the already quarried pits situated nearby the proposed quarry area. Hence, the quarrying rough stone up to the proposed depth may not have any adverse impact in the area over ground water conditions.

Rain water collected in the tanks in the region acts as a good source of water during post monsoon. In order to increase the recharge, tanks, and percolation ponds may be provided with the recharge wells/recharge shafts penetrating this impervious layer to make it more effective in recharging the aquifer.

CHAPTER - IV

ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

CHAPTER 4

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.1 GENERAL

In this project Mechanized Open Cast mining will be carried out to quarry out Rough Stone & Gravel. The identified impacts due to this mine during mining and associated activities have been studied in relation to various environmental components like Air, water, noise, vibration, land, transport etc., and the details of the same are elaborated in this chapter.

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 proposed mining and allied operations may cause 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 general due to mining and allied activities will be:

- ❖ Excavation of material.
- ❖ Movement of HEMM such as Excavators, tippers etc.
- ❖ Loading and unloading operation
- ❖ Transportation

Besides, Gas emission will occur as a result of operation of diesel driven mining equipment, 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 the above mentioned fugitive dust emissions, atmospheric pollution can occur as a result of emission of SO₂, NO_x, CO etc., from diesel driven mining equipment, generator sets, etc. Larger suspended particles are generally filtered in the nose and throat and do not cause problems. Higher concentration of SO₂, NO_x, CO may cause some health effect on the human

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beings exposed to it. In case of this mine, the following measures will be adopted to control impact on the air quality due to mining operations in the lease area:

Table 4.1: Impact and Mitigation Measures – Air Environment

S.No	Activity	Consequence	Mitigation Measures
1	Drilling	Dust Emanation	Usage of Drill bits in good condition
			Covering of drill holes with wet cloth
			Usage of sharp drill bits for drilling of holes.
			Provision of dust filters / mask to workers working at highly dust prone and affected areas.
2	Blasting	Instantaneous dust emanation	Well-designed blasting parameter, effective stemming to achieve optimum breakage occurs without generating fines.
			Use of appropriate explosives for blasting and avoiding overcharging of blast holes.
			Avoiding blasting during high wind periods where the fine dust is carried out away easily affecting the ambient air quality.
			Use of controlled blasting techniques with Nonel to keep the dust generation, noise as well as vibration level within the prescribed limits.
3	Excavation and Loading	Dust emanation, Gaseous Emission	HEMM will be operated as per the manufacturer's guidelines
			Enclosures for operator cabin.
			Imparting sufficient training to operators on safety and environmental parameters.
			Proper maintenance of hauling equipments.
4	Transportation	Dust emanation, Gaseous Emission	Avoiding overloading of dumpers.
			Regular wetting of transport road using mobile water tanker.
			Proper maintenance of haul road and other roads
			Setting up of tyre wash facility in the transport road.
			Avoiding overloading of tippers
			Covering of loaded tippers with tarpaulins during transportation
5	Others	Dust emanation, Gaseous Emission	Vehicular emissions will be controlled through regular and proper preventive maintenance schedules and emissions tests are done with diesel smoke meter equipment to ensure emission values.
			Development of greenbelt / barriers around mine in the safety zone and carrying out plantation within the lease area.
			Green netting will be carried out around the lease periphery on all sides.

Due to adoption of all these measures, no major impact on air quality is envisaged due to this proposed opencast mining operation.



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Considering that the quantum of production is less, only 1 excavator, 3 tippers will be engaged. These equipments will be properly and regularly maintained. Besides, as mentioned earlier, regular vehicular emission tests will be done for the transport vehicles to ensure minimal impact due to carbon emissions. To further mediate the carbon emissions, a good greenbelt and plantation plan has been planned wherein 750 number of plants will be planted in and around the lease area.

The impact on air quality due to the proposed project is estimated using AERMOD View Gaussian Plume Air Dispersion Model developed by Lakes Environmental Software which is based on steady state Gaussian plume dispersion. Details of the modeling study / estimation including the modeling technique and post project air quality values are elaborated in the following paras.

4.2.2 AIR QUALITY IMPACT PREDICTION:

The model simulations are done for the air pollutant arising from the mining operations, namely, PM_{10} , $PM_{2.5}$. **Ground Level Concentration (GLC)** have been computed using hourly meteorological data.

Table 4.2: Emission Sources

ACTIVITY	SOURCE TYPE
A. Mining operations	Open pit
B. Transportation	Line

4.2.2.1 Emission Factors

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 and suggested by AP-42, USEPA(1998), Coal S&T Project and for mining & allied activities and other factors. The modeling is done for the peak production to know the worst case scenario. The details of the emission factors used for the same is provided below:



Table 4.3: Emission Factors

S.No	Activity	PM10	PM2.5	Unit
1	Ore Loading	1.5×10^{-3}	2.1×10^{-4}	Kg/T
2	OB Loading	1.4×10^{-4}	1.5×10^{-5}	Kg/T
3	Hauling inside lease area	0.19	0.019	g/VKT
4	Drilling	0.1	0.04	Kg/hole

4.2.2.2 Emission Rates:

Based on the emission factors, after adopting necessary control measures like dust suppression, Proper maintenance of HEMM, using better quality diesel, using latest equipment, proper maintenance of roads, etc. the expected emission rate due to various operations in this project is calculated and is given below:

Table 4.4: Emission Rate

ACTIVITIES/POLLUTANTS	PM ₁₀ (g/sec)	PM _{2.5} (g/sec)
Ore Loading	0.02	0.00
Drilling	0.11	0.04
Hauling inside lease area	0.10	0.02
Total	0.23	0.06

A. Emission Source Coordinates: The center of mine was assumed (0, 0) in the mathematical modeling.

B. Meteorological Conditions Used In Predictions: The hourly meteorological data has been generated for the monitoring period and the same has been used in the predictions:

4.2.2.3 Results and Discussions

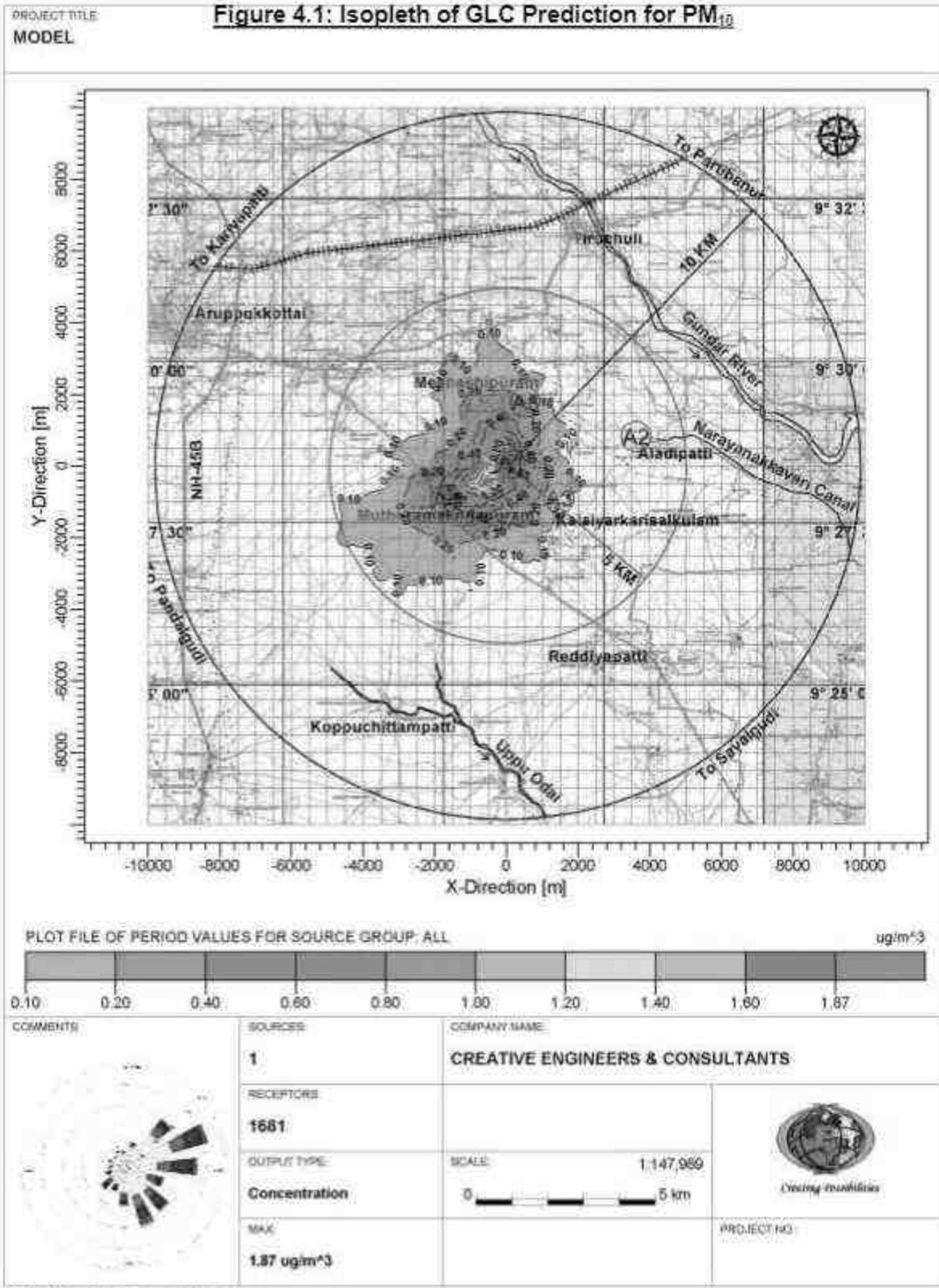
Table 4.5: Peak Incremental Concentration

S.No	Parameters	Peak incremental concentration $\mu\text{g}/\text{m}^3$
1	PM ₁₀	1.87
2	PM _{2.5}	0.60

It is observed that the peak incremental concentration for PM₁₀, PM_{2.5} occurring very near the source. At away from the source the values are getting reduced due to dispersion effects. The Isopleths of PM₁₀, PM_{2.5} concentrations with control measures scenario have also been drawn and these are given in **Figure No.4.1 and 4.2**. The incremental and predicted concentrations at the locations of ambient air quality have been discussed in the following section.



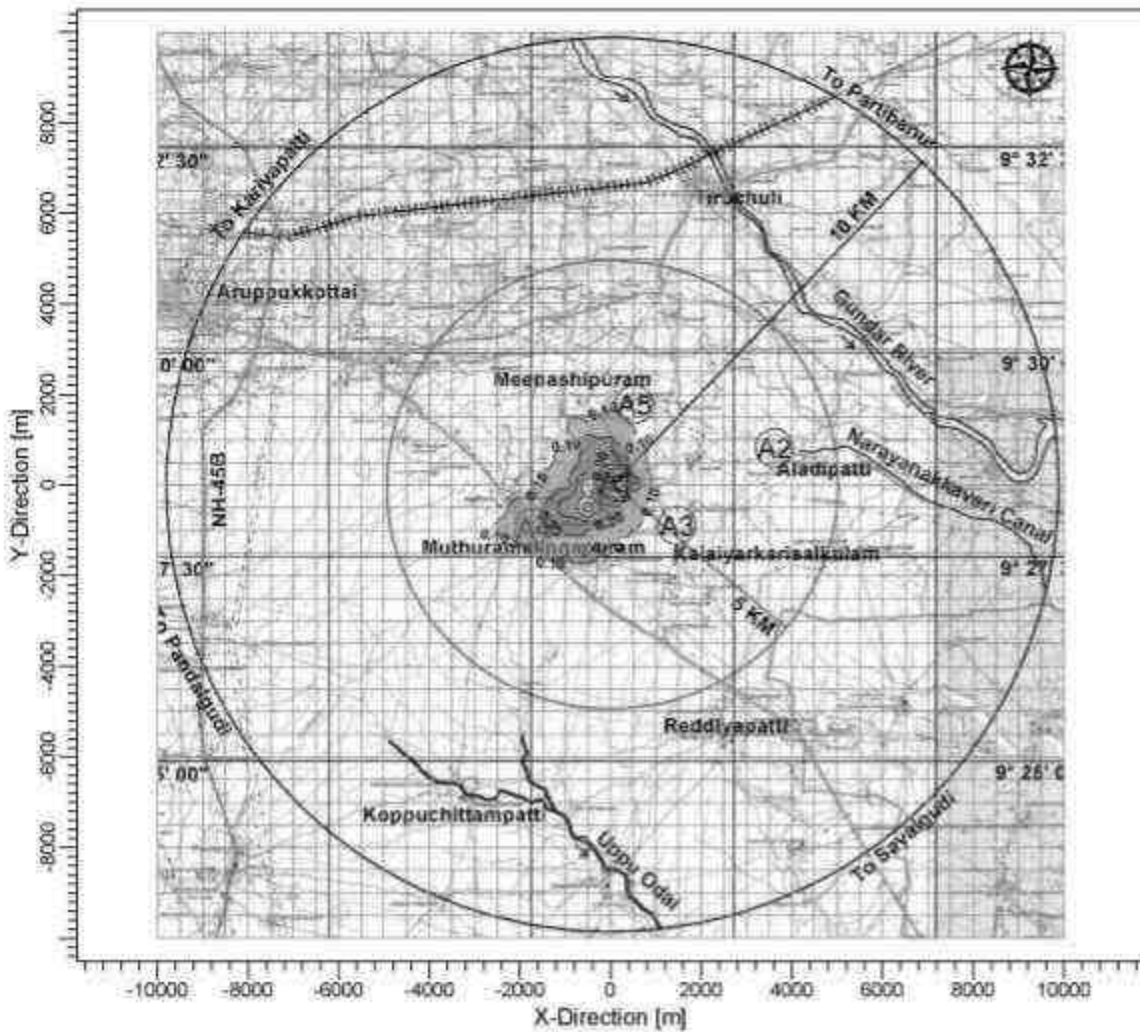
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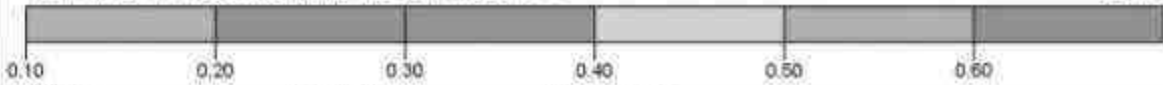
PROJECT TITLE
MODEL-PM2.5

Figure 4.2: Isopleth of GLC Prediction for PM_{2.5}



PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL

ug/m³



	SOURCES 1	COMPANY NAME CREATIVE ENGINEERS & CONSULTANTS	
	RECEPTORS 1681		
	OUTPUT TYPE Concentration		
	SCALE 0 5 km	SCALE 1:147,589	
MAX 0.80 ug/m ³	PROJECT NO.		

KERMOD View - Lakes Environmental Software



Creative Engineers & Consultants

REV NO : 00/NOV/23

4-6

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TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

Predicted Ambient Air Quality:

The post project Concentrations of PM₁₀, PM_{2.5}; (GLC) (base line + incremental) after adopting necessary control measures is given in Table No - 4.6 to 4.7:

Table 4.6: Concentrations Of PM₁₀ after Project Implementation

Values in $\mu\text{g}/\text{m}^3$

S. No	Location	Background Concentration	Predicted Incremental Concentration	Post Project Concentration	Statutory Limits
1	Near Mine Lease Area	58.6	1.8	60.4	-
2	Aladipatti Village	69.6	<1.0	70.6	100
3	Kalaiyarkarisalkulam Village	52.8	<1.0	53.8	
4	Muthuramalingapuram Village	49.1	<1.0	50.1	
5	Meenashipuram Village	54.4	<1.0	55.4	

Table 4.7: Concentrations Of PM_{2.5} after Project Implementation

Values in $\mu\text{g}/\text{m}^3$

S. No	Location	Background Concentration	Predicted Incremental Concentration	Post Project Concentration	Statutory Limits
1	Near Mine Lease Area	27.9	<1.0	28.9	-
2	Aladipatti Village	33.1	<1.0	34.1	60
3	Kalaiyarkarisalkulam Village	24.0	<1.0	25.0	
4	Muthuramalingapuram Village	22.7	<1.0	23.7	
5	Meenashipuram Village	24.8	<1.0	25.8	

It can be seen that the resultant added concentrations with baseline figures even at worst scenario, show that the values of ambient air quality with respect to PM₁₀ are in the range of 50.1 $\mu\text{g}/\text{m}^3$ to 70.6 $\mu\text{g}/\text{m}^3$ and with respect to PM_{2.5} are in the range of 23.7 $\mu\text{g}/\text{m}^3$ to 34.1 $\mu\text{g}/\text{m}^3$ which are within the statutory limits in each case. For preservation of environment in this mine strict enforcement of management schemes and regular air quality monitoring will be undertaken for taking corrective actions, as needed. By adopting the effective implementation of all the mitigative measures, no adverse impact on Air quality due to the mining operation in this lease area is expected.

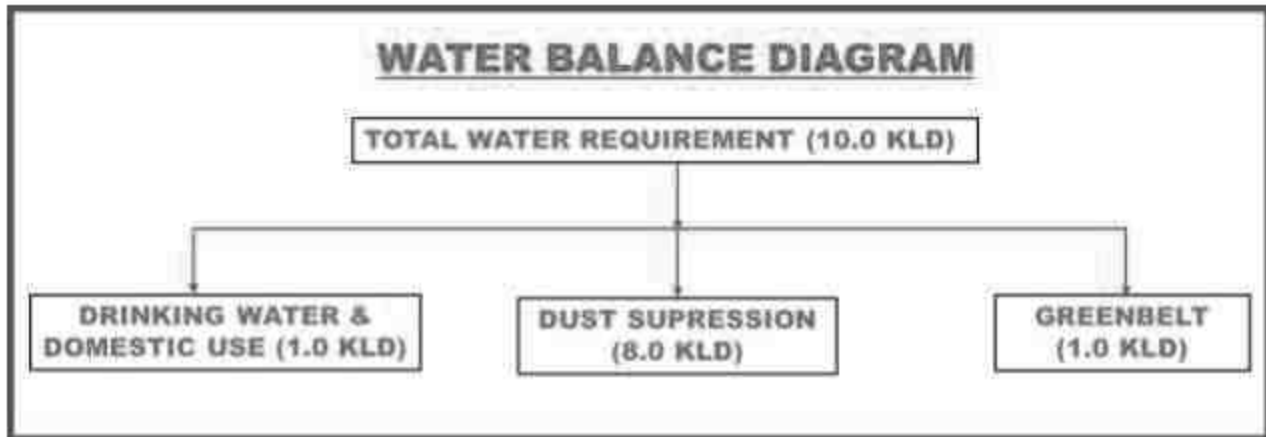


4.3 WATER ENVIRONMENT:

4.3.1 WATER REQUIREMENT:

The total water requirement for this project will be 10.0 KLD comprising 1.0 KLD for drinking water and domestic use, 8.0 KLD for dust suppression and 1.0 KLD for greenbelt. The water will be sourced initially from outside agencies. Later the rainwater collected in the mine pit sump will be used for this purpose. The water balance diagram for the same is shown in **Figure No 4.3**.

Figure 4.3: Water Balance Diagram



4.3.2 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:

- a. Domestic effluent.
- b. Washouts from stockpile if any.
- c. Disturbance to drainage course in the project area
- d. Generation of mine pit water pumped out from deeper workings if any.

4.3.3 TREATMENT SCHEME:

A. Generation of domestic effluent:

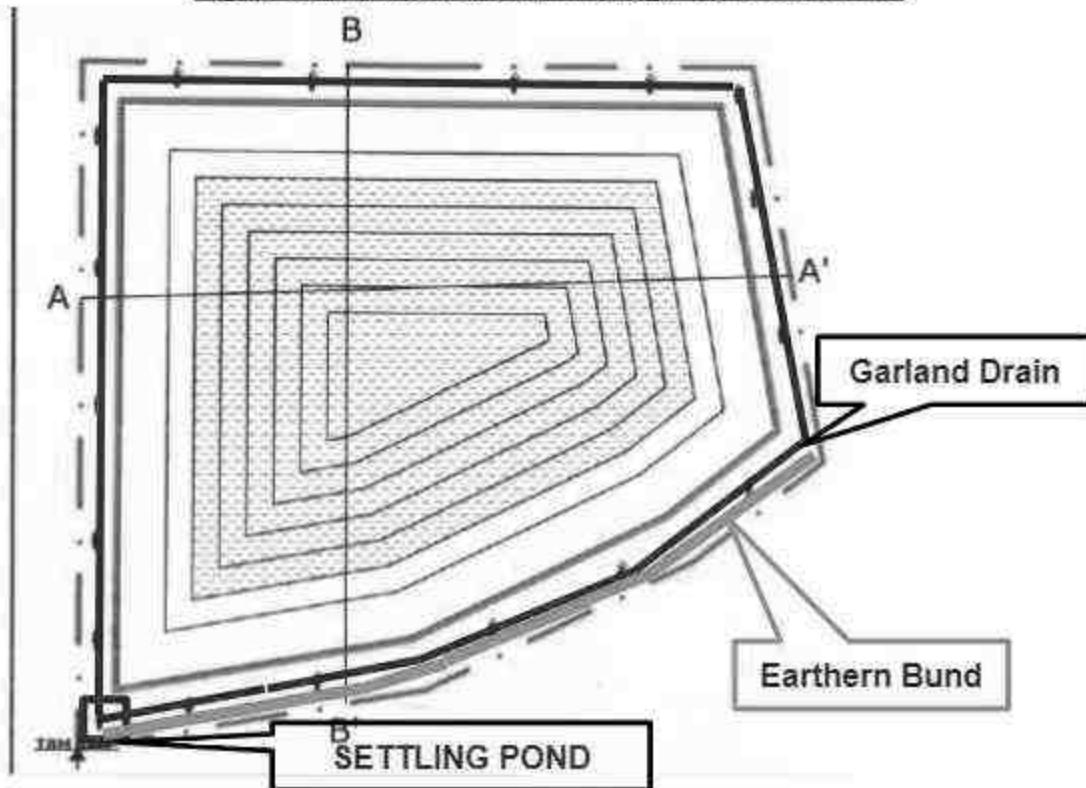
The domestic sewage to be generated from the project will be collected in septic tank with soak pits.

B. Washouts from overburden, ore stockpile, etc.

Since the entire material from the quarry face will be directly dispatched to the consumers, there will not be any stockpiles. There are no waste dumps in this quarry. As such there will not be any wash out due to stock pile or waste dumps.

The rain water falling in the quarry will be harvested in the sump at the lowest level of the quarry. This sump will act as a settling pond to prevent solids escaping along with discharge, before outlet, etc. Towards surface runoff management, a garland drain of length 450m will be constructed around the quarry and will be connected to a settling pond with silt traps. Earthen bund provide of length 150m in southern side for safety barrier. The supernatant clear water from the settling pond will be flow to the downstream users. The surface runoff management structures diagram is given in **Figure No 4.4.**

Figure 4.4: Surface Runoff Management Structures



C. Disturbance to drainage courses

There is a seasonal drainage channel located on the southern side of the lease for which 10m safety distance has been left. Earthen bund will be formed within the lease area. There is no proposal to discharge any effluent into this waterbody. No major impact is envisaged on the nearby water bodies due to project operations

D. Generation of mine pit water pumped out from deeper workings if any.

The occurrence and movement of groundwater in hard rock formations are restricted to the porous zones of weathered formations and the open systems of fractures, fissures and joints. Generally, in hard rock regions, occurrence of weathered thickness is discontinuous both in space and depth. Hence recharge of groundwater in hard rock formations is influenced by the intensity and depth of weathering. In the nearby region, the formations are compact with less intergranular porosity and fractures leading to less permeability and transmissivity values and as such the ground water level in this area is deep from surface. The mining area consists of hard compact rock, hence no major water seepage within the mine is expected from the periphery. The ultimate pit depth of mining is 41m. The ground water table in this area is below this level. Hence, ground water intersection is not envisaged and ground water will not be affected appreciably due to the quarrying operation. As mentioned earlier, the rainfall will be collected in the mine floor sump and advantageously used. Excess water if any in the sump will be pumped to settling pond for downstream users.

4.3.3.1 STAGE OF GROUNDWATER DEVELOPMENT

Details of hydrological scenario of the study area were given in para 3.6, Chapter – III. The groundwater resource data of Virudhunagar district was obtained from the data provided in the technical report of the National Water Mission – Notes on Virudhunagar District.

Table 4.8: Ground Water Resources Estimation– Aruppukottai Taluk (Ha-m)

Net Groundwater Availability	Existing Gross Draft for Irrigation	Existing Gross Draft for Domestic and Industrial water supply	Existing Gross Draft for all uses	Stage of Ground water Development (%)	Category of Block
285.39	28.25	10.37	38.62	14	Safe



From the table it is seen that the stage of groundwater development of Aruppukottai where the study area falls is 14%. In view of this, this area can be categorized as 'Safe' from ground water development point of view. Thus there is scope for further ground water development.

4.3.4 REDUCING WATER CONSUMPTION OVER THE YEARS:

4.3.4.1 GENERAL METHODS:

Use of water will be monitored and used to the minimum required. Awareness will be spread to the employees about the importance of water conservation. Tap and showers will be turned off immediately after use and any leaks will be monitored and immediately controlled. Water requirement for greenbelt and dust suppression can be reduced by choosing the native plants/trees species with low water requirement and which can sustain in such conditions for greenbelt/ plantation and also optimum usage to the required minimum. While the dust suppression itself is an important method of pollution control for air pollution due to dust, the water consumption will be monitored strictly. The water tanker will be examined for any sources of leaks and if found will be immediately sealed so that water can be utilized for dust suppression effectively without loss.

4.3.4.2 RAINWATER HARVESTING PLAN

Since the lease proximate areas are with less water potential and the rainwater is the major source for replenishment of ground water, effective rainwater harvesting and other water augmentation measures are proposed in this project.

- a) Development of garland drain around the quarry connected to settling tank.
- b) Cleaning of drain periodically to prevent siltation
- c) The supernatant clear water from the settling pond will drain into the nearby drainage on the western side of the lease.
- d) Utilizing the rainwater harvested in the mine pit to meet the water requirement of the project
- e) Excess water, if any in consultation with local villagers and in line with government practices shall be provided to the downstream users.

4.4 NOISE AND VIBRATION:

4.4.1 NOISE ENVIRONMENT:

The ambient noise levels in the study area have been discussed in Chapter - III. The data shows that the existing noise levels are within statutory tolerable 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 – 4.9.**

Table 4.9: Main Sources of Noise

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.	Drill	88- 95	75-83

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 - 4.10.**

Table 4.10: Impact of Noise Levels

NOISE LEVELS	ADVERSE EFFECTS
90-115 dB	Partial deafness and nervous irritability
> 115 dB	Permanent deafness
Impulsive noise (>90dB)	Frightens livestock grazing in the nearby areas



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OSHA (Occupational Safety and Health Administration), USA and other similar organisations stipulate that noise level up to 90 dB(A) 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 dB(A) or less.

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) 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, 5 dB(A) of additional attenuation can be obtained up to a maximum of 10 dB(A). As such at away places the effect of noise will not be felt.

Anticipated noise levels resulting from operation of the various machineries like excavator, tippers, drill have been computed using point source model. Computation of cumulative noise levels at the nearby villages is made based on the assumption that there are no attenuation paths between the source and the boundary.

Noise modeling is carried out using the following formula:

$Lp2 = Lp1 - 20 \log R2/R1$, Where, $Lp1$ and $Lp2$ are sound pressure levels at points located at distances $R1$ and $R2$ respectively from the source. The study results are as follows:

Table 4.11: Post Project Noise Levels

Sl.No	Location	Baseline Day Eq.in dB(A)	Post project noise Eq in dB(A)	Limit dB(A) as per MoEF&CC
1.	Near Mine lease area	51.9	53.9	90
2.	Aladipatti Village	49.8	50.0	55
3.	Kalaiyarkarisalkulam Village	48.9	49.1	55
4.	Muthuramalingapuram Village	47.7	48.0	55
5.	Meenashipuram Village	44.9	45.2	55

From the studies, it is found that the predicted Noise Levels due to mining operations at the periphery of the mine lease itself will be less even without considering any attenuation factor. However, practically there will be attenuation due to vegetation etc., and as such there will not be any adverse noise propagation outside the lease boundary. Since the habitations are also



away the effect of noise due to mining operations will not be felt at all in the surrounding villages.

4.4.1.2 CONTROL MEASURES FOR NOISE ENVIRONMENT:

Hence, by following mitigative measures for noise control, the impact on noise levels will be insignificant:

- Planting rows of native trees along roads, around mine area and other noise generating centers to act as acoustic barriers.
- Sound proof operator's cabin for equipments like shovel, tippers, etc.
- Proper and regular maintenance of equipments may lead to less noise generation.
- Providing in-built mechanism for reducing sound emissions.
- Providing earplugs 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.
- Provision of tin net on the southern side and green net along the lease periphery on the other sides.

Further green belt and afforestation will be planned and executed to abate noise and dust propagation in the area.

4.4.2 GROUND VIBRATIONAL DUE TO BLASTING EFFECTS:

Vibrations due to blasting may cause damage to nearby structures, if appropriate control measures are not adopted. Flyrock is another possible damage causing outcome of blasting. There are many factors, which influence these, like long explosive column with little stemming column, improper burden, loose material or pebbles near holes and long water columns in the holes.



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The following control measures will be planned to reduce ground vibratory conditions to sustainable statutory limits:

- 1) Carrying out controlled blasting using Nonel delay detonator.
- 2) Optimum design for burden and spacing.
- 3) Reducing explosive charge per delay to minimum.
- 4) The peak particle velocity (PPV) of ground vibration will be kept very low through optimally controlled blasting techniques, after necessary field trials.
- 5) To contain fly rocks, stemming column to be less than burden of the hole. Blasting area will also be muffled, if necessary, to stop fly rocks propagation.
- 6) Blasting will not be carried out when strong winds are. Blasting will be done during midday time.
- 7) Controlled blasting to avoid tension cracks which may endanger the stability of bench slopes in the mine.
- 8) Proper care and supervision during blasting by a competent and experienced person to be carried out.

By adoption of above measures, it will be ensured that the ground level vibration due to blasting are maintained within the limits prescribed by DGMS, Dhanbad at the mining areas vide Circular No. 7 dated 29-08-1997 as given below

Table 4.12: Permissible Peak Particle Velocity (PPV) In Mining Areas

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



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Besides, different blasting time for the projects in the vicinity is suggested and the timing is to be mentioned in the display board in the respective mines entrance.

4.5 LAND ENVIRONMENT:

The lease area of 1.50.0 Ha in S.F.No.44/1(P), 44/5(P), 44/6, 44/7, 44/8 is a patta land in the name of the applicant vide Patta No. 577 (Annexure-V of Mining Plan). The present land use pattern, and the post mining land use pattern is shown below:

Table 4.13: Land Use Table

S.No	Land Use	Present Area (Ha)	Area at the end of quarrying period (Ha)
1	Quarrying Pit	--	0.86.5
2	Infrastructure	--	0.01.0
3	Roads	--	0.02.0
4	Green Belt	--	0.60.5
5	Unutilized	1.50.0	--
	Total	1.50.0	1.50.0

4.5.1 LAND RECLAMATION:

There is no waste generation anticipated in this quarry operation since the entire excavated material will be utilized. Hence, there is no external overburden dump involved. In the post mining stage, an area of 0.865 Ha of mined out area will be left as water body, 0.01Ha will be infrastructure, 0.02 Ha will be roads and 0.605 Ha will be covered with vegetation.

Table 4.14: Land Use During Post Operational Period

S.No	Description	Land use (Ha.)			
		Plantation	Water body	Others	Total
1	Quarrying Pit	-	0.86.5	-	0.86.5
2	Infrastructure	0.01.0	-	-	0.01.0
3	Green Belt	0.60.5	-	-	0.60.5
4	Road	0.02.0	-	0.02.0	0.02.0
5	Unutilized	--	-	-	--
	TOTAL	0.63.5	0.86.5	0.02.0	1.50.0

Entire mined out area will be properly fenced to prevent inadvertent entry of men and animals. In the post mining stage the entire mined out area shall be used as a rainwater harvesting pond.



4.6 BIOLOGICAL ENVIRONMENT:

4.6.1 EXISTING FLORA AND FAUNA:

The core zone area is barren with grasses and bushes. Details of flora/fauna pattern in core and buffer zones have been described in chapter - III.

4.6.2 IMPACT OF MINING ON BIOLOGICAL ENVIRONMENT:

The significance of impact on biological environment due to mining and allied activities on various fronts is described below:

Table 4.15: Impact on Biological Environment

S.No	ISSUES	OBSERVATIONS
1	Clearance of vegetation due to mining and allied activities	No clearance of major vegetation is involved.
2	Retardation of tree growth, tip burning, etc, due to deposition of dust and the Particulate matter generated from the mining operation.	Necessary mitigative measures like dust suppression, proper maintenance of equipment's, roads will be carried out to prevent dust generation.
3	Proximity to national park/ wildlife sanctuary/reserve forest/mangroves/Coastline/estuary/ sea	The mining lease area and the 10 km buffer zone from the periphery of the core zone is devoid of declared ecologically sensitive features like national parks, biospheres, sanctuaries, etc.
4	Release of effluents into water body that also supplies water to wildlife	There is no proposal to discharge any effluent into nearby water bodies.
5	Proposed project could increase siltation that would affect nearby biodiversity area	Surface runoff management structures like garland drain, settling pond etc. as explained above will be constructed and as such there will not be any appreciable impact on surface water quality which in turn can affect the bio diversity of the area.
6	Activities of the project affects the breeding/nesting sites of birds and animals	In the present ML area, there is no wetland. A migratory bird needs sufficient wetlands with sufficient food, shelter, roosting places and nesting places which is not possible here.
7	Located near an area populated by rare or endangered species	There are no Schedule 1 animals
8	Risk of fall/slip or cause death to wild animals due to project activities	In the post mining stage, barbed wire fencing is proposed all around the mined-out void to prevent falling of animals in the mine pits.
9	Project affects the forest-based livelihood/any specific forest product on which local livelihood depends	Not applicable
10	Project likely to affect migration routes	No migration routes are in the area.

**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

11	Project likely to affect flora of an area, which have medicinal value	No such significantly important medicinal value species within the ML area and its nearby region.
12	The project likely to affect wetlands, fish breeding grounds, marine ecology	There are no any wetlands, fish breeding grounds, marine ecology nearby the ML area which will be affected due to this project.
13	Project affects the Agriculture, Forestry and Traditional Practices	Most of the study area remain uncultivated and only in patches of land away from the lease area, agricultural activities are carried during monsoon rainfall. Due to poor quality of the soil, inconsistent rainfall, water scarcity, high agricultural labor cost, manpower shortage and less yield are reason for very little agricultural activity in this region.
14	Impact on soil health and biodiversity	The lease area is covered with grasses and bushes only (Photograph of the site attached in Chapter-II). Besides, there is no waste generation, disposal or stacking involved in this project. As such no loss of soil health and Bio-diversity is expected.
15	Climate change leading to droughts, floods, etc.	<ul style="list-style-type: none"> •As such the production from this lease is very low to cause any appreciable impact. •No adverse impact on the surrounding environment is envisaged since the number of equipments to be used to achieve this small production is very less and the magnitude of operation is of very small level. •Besides, as is it a mining project, no adverse generation of heat is envisaged. •Certified vehicles with low carbon emissions will only be used. These equipments will be properly and regularly maintained. Besides, regular vehicular emission tests will be done for the transport vehicles to ensure minimal impact due to carbon emissions. To further mediate the carbon emissions, a good greenbelt and plantation plan has been planned wherein 750 number of plants will be planted in and around the lease area. •Geologically the area in and around the lease area contains charnokite type rock formation containing mostly fallow land. As such there no major vegetation or agricultural activities are observed. •There are no Protected or Eco-Sensitive Zone or forest land nearby wherein it can have an impact. •It will be ensured that mining will be carried out adhering to all the statutory rules and regulations and maintaining the environmental quality within the prescribed standards by effective implementation of various mitigative measures. •These mitigative measures will be continued for the entire lease period ensuring no impact on the environment. •As such release of Greenhouse gases (GHG), rise in temperature, affecting livelihood of the local people, loss of Agriculture, Forestry and Traditional Practices is not envisaged. Such a limited scope will not induce any climatic
16	Pollution leading to release of greenhouse gases (GHG) rise in temperature (Hydrothermal/Geothermal effect due to destruction in environment, Bio-geochemical processes and its foot prints including environmental stress) and livelihood of local people.	



17	Possibilities of water contamination and impact on aquatic ecosystem health and impact on Sediment geochemistry in the surface streams	<p>change leading to droughts, floods etc.</p> <ul style="list-style-type: none"> • This being a mining project no process effluent will be generated. • Water generation is expected to be due to <ul style="list-style-type: none"> ✓ Direct rainfall falling within the pit ✓ Rain water draining near the lease area. • Direct rain fall will be collected in the mine floor sump. Water from sump will be pumped to settling pond for downstream users. • Rainwater from the mine periphery will be collected through peripheral garland drain. Garland drain will be connected to a settling pond. Supernatant clear water from settling pond conforming to applicable limits will be let out to downstream users for agricultural or other purposes. • Due to above mentioned reasons and absence of perinial water bodies nearby where in any marine ecosystem is observed, no effect on this front is expected.
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There are no migratory corridors, migratory avian-fauna, rare endemic and endangered species. Therefore there shall be no impacts due to mining activity on them. Even though there are no adverse impact on bio diversity and flora/fauna status due to project operations, positive impacts will arise due to well-planned reclamation measures for restoration of land status in the area ultimately to productive land category with elaborately planned green belt development activities.

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, mobile water tanker systems will be ensured in all dust prone areas to arrest dust generation. 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 along the lease boundary in a phased manner.

4.6.4 GREEN BELT & PLANTATION:

In the lease area, safety barrier 7.5m around the periphery and 10m safety zone for the Odai on the southern side of the lease area. About 750 trees will be planted in and around the lease area.

**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

Table 4.16: Proposed Plantation

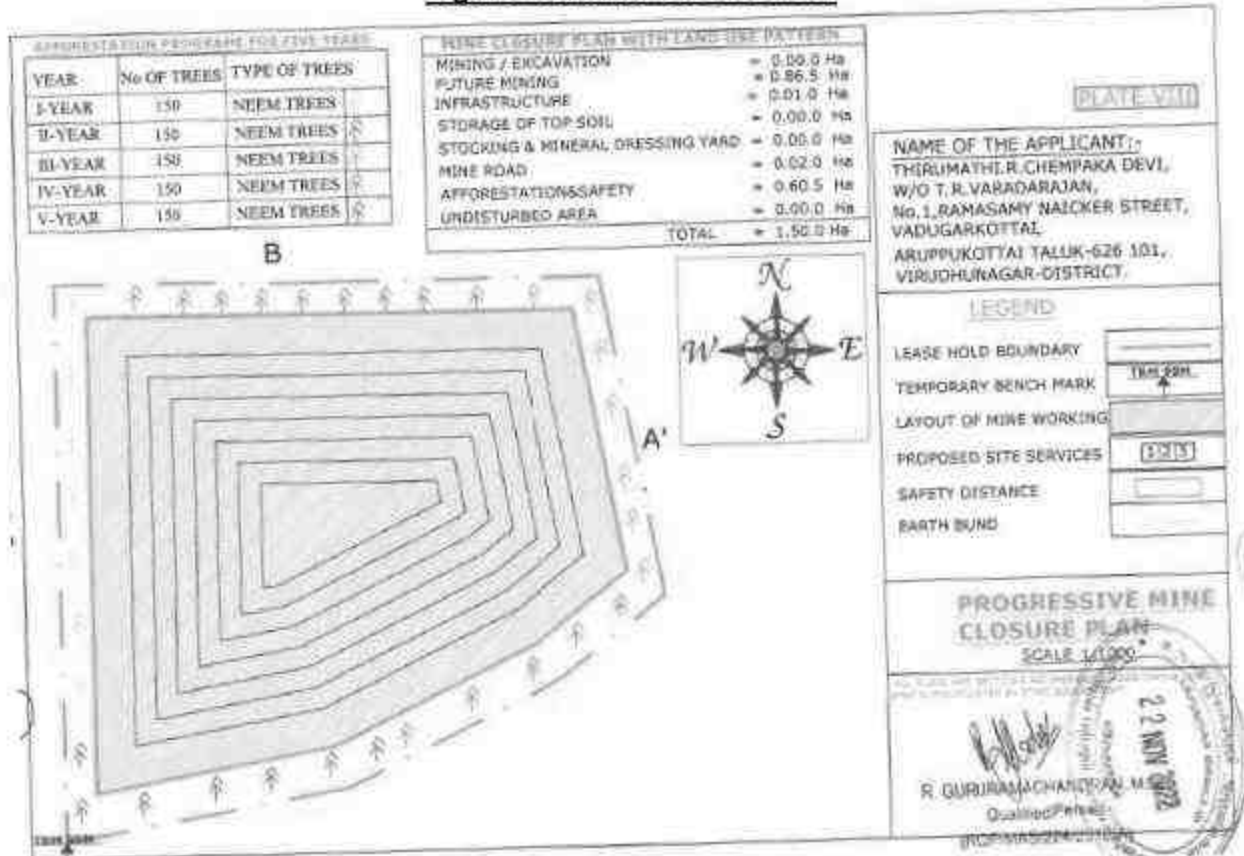
Year	No. of trees proposed to be planted	Name of the species
I	150	Pungai, Vagai, Vembu, Manjal konrai, Naval, Puvarasu, etc.,
II	150	
III	150	
IV	150	
V	150	
Total	750	

In the post mining stage, an area of 0.865 Ha of mined out area will be left as water body, 0.01Ha will be infrastructure, 0.02 Ha will be roads and 0.605 Ha will be covered with vegetation. The post mining land use plan showing afforestation and water body is shown in **Figure No- 4.7.**



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Figure 4.5: Mine Closure Plan



4.7 SOCIO ECONOMIC ENVIRONMENT:

The entire lease area is in the proponent's possession. Hence, there are no habitations or hutments in the core zone area and no rehabilitation or resettlement problems will arise here.

The mining operations in the proposed mine will employ about 20 persons directly and about 50 persons on indirect basis through allied opportunities in logistics, trading, repairing works etc. good employment potential will arise in this area, which will provide raising income levels and standards of living in the area through various service related activities connected with the project operations as shown under.

- Project related logistical operations for transport of Rough Stone, 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.

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- Casual labor needs for various activities.

Besides, there will be improvement in the following aspects due to project operation:

- ❖ Improvement in infrastructural facilities, providing education aids etc. in nearby schools
- ❖ Betterment of drinking water facilities.
- ❖ 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 will have highly beneficial positive impact in the area.

Table 4.17: CER Cost

Project Cost (Rs.)	Rs. 50,14,760/-
CER Cost Requirement (2% of the Project Cost) (Rs.)	Rs. 1,00,295/-
Revised CER cost allocated (Rs.)	Rs. 5,00,000/-

However, towards the socio economic development of the surrounding area, the proponent has earmarked an amount of Rs.5 Lakhs under Corporate Environmental Responsibility. The activities identified under CER will be implemented in a phased manner in provision of facilities in nearby Government School.

4.8 OCCUPATIONAL HEALTH AND SAFETY:

4.8.1 BASELINE STATUS:

Primary data collection through field survey conducted in the study area reveals that there is no reported incident of any occupational diseases in the area. Hazardous jobs like blasting, loading, etc. are planned to be executed safely and with all precautionary measures as prescribed in Metalliferrous Mines Regulations of 1961, 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
- Tuberculosis
- 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 etc.
- Green belt 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 plug 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 of workers by qualified doctors, as per DGMS circulars.
- Regular awareness campaigns amongst staff and workers.
- Staff will be provided with PPE to guard against excess noise levels, Dust generation and inhalation, etc., as per standards prescribed by DGMS.

4.8.4 MITIGATIVE MEASURES FOR SAFETY ASPECTS:

The following safety gadgets will be provided to the staff and workers based on their area of operation and work & requirement:

Sl No	Safety Equipments
1.	Helmets
2.	Shoes

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Sl No	Safety Equipments
3.	Goggles
4.	Dust Mask
5.	Hand Gloves
6.	Reflective Jackets
7.	Ear Muffs
8.	Signal Lights/Flags

4.9 LOGISTICAL SYSTEM:

From this proposed quarry the entire output will be transported to the crusher units for producing stone aggregates of different sizes or construction of roads, bridges, buildings and other buyers etc. The expected peak transport will be as follows:

Table 4.18: Details of Transportation

Sl.no	Particulars of activity	Quantity
A	Maximum Roughstone Transported (m ³ /year)	60,850
B	No of days in a year	300
C	Transport hours per day	8
D	Truck capacity in T	20
	Trips per hour	3 Trips/hr

From the above table it is seen that there will be about 3 trips per hour. The existing road can absorb this traffic due to this project. However, the following mitigative measures are suggested:

- ❖ Water sprinkling on material in the transport vehicles before transporting, so that no dust nuisance during transport will arise.
- ❖ Plantation on either side of the transport road in consultation with the concerned department.
- ❖ Proper maintenance of transport roads
- ❖ Proper maintenance of transport vehicles.
- ❖ Avoiding overloading of material
- ❖ Covering of loaded vehicles with tarpaulins sheet if warranted.
- ❖ Keeping traffic regulators at vulnerable locations.
- ❖ Distribution of transport vehicles for avoiding choking of roads



- ❖ Limiting of speed
- ❖ Installation of barriers at vulnerable locations
- ❖ Provision of tyre washing facility at the mine outlet.

4.10 WASTE MANAGEMENT:

Solid Waste: Since the entire mined out material will be used there will not be any solid waste generation from this project.

Liquid waste: There is no process effluent generation from this mine. Hence no liquid waste is generated.

Hazardous waste management: In this project the following management practices will be followed:

- Ensuring availability of different colour bins for collection of different types of waste.
- Storing of Hazardous waste material in a separate storage area with impervious containers for waste oil, oil contaminated clothes, used lead acid batteries, scraps, tyre storage etc.
- Ensure that there are no leakages/spillages of hazardous wastes.
- Ensuring that the fire extinguisher system is available at hazardous material storage area.

The hazardous waste if any will be disposed through authorized recyclers or re-processors periodically. The hazardous wastes will be transported in accordance with the provisions of rules. By effective implementation of above said mitigation measures no major impact due to Hazardous waste is expected.

Plastic waste: Single use plastics/ use and throwaway plastics will be banned in the site as directed by the Tamil Nadu Government vide GO(Ms)No.84 regarding ban on use of plastic products. The employees will be encouraged to use compostable material or reusable material.



CHAPTER - V

ANALYSIS OF ALTERNATIVES (TECHNOLOGY & SITE)

**CHAPTER 5
ANALYSIS OF ALTERNATIVES**

5.1 ALTERNATE TECHNOLOGY:

This is a proposed Rough Stone and Gravel Quarry in which Mechanized Open Cast mining will be carried out. It involves jack hammer drilling, blasting, excavation, loading and transportation of Rough stone to the crushing units. As this method is techno economically proven, consideration of an alternate technology is not warranted.

5.2 ALTERNATE SITE:

The mineral deposits are site specific in nature; hence question of seeking alternate site does not arise.



CHAPTER - VI

ENVIRONMENTAL MONITORING PROGRAMME

CHAPTER 6

ENVIRONMENTAL MONITORING PROGRAMME

6.1 GENERAL

In this project, appropriate environmental monitoring programme are framed. 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. This being a small quarry operation, the Mines in-charge will take care of all the environmental related works also.

Environmental control measures include components like air, water and soil quality, noise levels, 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 MONITORING SCHEDULES FOR VARIOUS PARAMETERS

The monitoring schedules are planned for systematic study of various pollution levels with respect to air and water qualities, noise levels, etc. to ensure that they conform to the standards laid down by Environmental Protection Act and various statutory Limits. However, based on the need and priority it may be suitably modified / improved in consultation with local authorities. The monitoring schedules to be adopted in this quarry are given below.



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

Table 6.1: Environmental Monitoring Schedule

S.No	Environmental Parameters	Parameters to be monitored	Monitoring area coverage /locations	Frequency of monitoring
1	Air Quality	Sulphur dioxide (SO ₂), Oxides of Nitrogen (NO ₂), Respirable Particulate Matter (PM _{2.5} and PM ₁₀).	2 locations in the buffer zone and 1 work zone locations.	Once in a year in each location.
2	Water Quality	General, Physical, and chemical parameters	Ground Water samples (around the project area) and Mine Pit water samples	Once in a year
3	Water Table Fluctuations	Water Levels	Nearby wells and Borewells	On yearly basis pre and post monsoon level
4	Noise	Leq, Lmax Lmin, Leq Day & Leq Night dB(A)	Work zone locations and buffer zone villages	Once in a year
5	Vibration	Peak Particle Velocity	Mine periphery	Once to arrive at optimum blasting parameters
6	Socio Economic Environment	Socio Economic Survey, Review of implementation of CER activities proposed	Buffer Zone	Yearly basis
7	Occupational Health	Occupational health survey to detect early incidence of diseases, Audiometry Test for workers in noise prone area and review of safety matters.	Staff and Workers involved in the project	Once in a year
8	Greenbelt	Maintenance	Within the lease area	Regularly

6.3 LEGISLATIVE AND REGULATORY FRAME WORK:

The project will have environmental policy declaring its responsibility and commitment to protect the environment and to ensure public safety. The existing policy will be available with all concerned officials of the plant. The following environmental standards as per methodologies prescribed, by MOEF/CPCB/TNPCB will be enforced in this project:

Table 6.2: Environmental Standards

Standards	Issued By	Reference
National Ambient Air Quality Standards	Central Pollution Control Board	Table No. 6.3
Water quality standards per IS 10500:2012	Bureau of Indian Standards	Table No.6.4
Noise Standards	CPCB / MoEF&CC	Table No.6.5
Permissible Peak Particle Velocity	DGMS, Dhanbad	Table No.6.6



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

Table 6.3: National Ambient Air Quality Standards

NATIONAL AMBIENT AIR QUALITY STANDARDS CENTRAL POLLUTION CONTROL BOARD NOTIFICATION New Delhi, the 18th November, 1986					
No. B-29014/2898/PC-I- 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 11 th April, 1994 and S.O. 933(E), dated 14 th 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	25 30	- Improved West and Gaeke - Ultraviolet fluorescence
2	Nitrogen Dioxide (NO ₂), µg/m ³	Annual* 24 hours**	40 80	20 30	- Modified Jacob & Havelokor (Di-Azotolu) - Chemiluminescence
3	Particulate Matter (size less than 10µm) or PM ₁₀ , µg/m ³	Annual* 24 hours**	50 100	50 100	- Gravimetric - TCEM - 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 - TCEM - 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 EPA 2000 or equivalent filter paper - ED-XRF using Teflon filter
7	Carbon Monoxide (CO), µg/m ³	8 hours** 1 hour**	02 04	02 04	- Non Dispersive Infra Red (NDIR) spectrometry
8	Aerosols (NH ₃), µg/m ³	Annual* 24 hours**	100 400	100 400	- Chemiluminescence - Indophenol Max method



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

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/4/18409/Eny.]

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.



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

Table 6.4: IS – 10500 :2012 Standards

**Table 1 Organoleptic and Physical Parameters
(Foreword and Clause 4)**

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to Part of IS 3025	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Colour, Hazen units, Max	5	15	Part 4	Extended to 15 only, if toxic substances are not suspected in absence of alternate sources
ii)	Odour	Agreeable	Agreeable	Part 5	a) Test cold and when heated b) Test at several dilutions
iii)	pH value	6.5-8.5	No relaxation	Part 11	—
iv)	Taste	Agreeable	Agreeable	Parts 7 and 8	Test to be conducted only after safety has been established.
v)	Turbidity, NTU, Max	1	5	Part 10	—
vi)	Total dissolved solids, mg/l, Max	500	2 000	Part 16	—

NOTE — It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

**Table 2 General Parameters Concerning Substances Undesirable in Excessive Amounts
(Foreword and Clause 4)**

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Aluminium (as Al), mg/l, Max	0.03	0.2	IS 3025 (Part 53)	—
ii)	Ammonia (as total ammonia-N), mg/l, Max	0.5	No relaxation	IS 3025 (Part 24)	—
iii)	Anionic detergents (as MBAS), mg/l, Max	0.2	1.0	Annex K of IS 13428	—
iv)	Barium (as Ba), mg/l, Max	0.7	No relaxation	Annex F of IS 13428* or IS 15302	—
v)	Boron (as B), mg/l, Max	0.5	1.0	IS 3025 (Part 57)	—
vi)	Calcium (as Ca), mg/l, Max	75	200	IS 3025 (Part 40)	—
vii)	Chloramines (as Cl ₂), mg/l, Max	4.0	No relaxation	IS 3025 (Part 26)* or APHA 4500-Cl G	—
viii)	Chloride (as Cl), mg/l, Max	250	1,000	IS 3025 (Part 32)	—
ix)	Copper (as Cu), mg/l, Max	0.05	1.5	IS 3025 (Part 42)	—
x)	Fluoride (as F), mg/l, Max	1.0	1.5	IS 3025 (Part 60)	—
xi)	Free residual chlorine, mg/l, Min	0.2	1	IS 3025 (Part 26)	To be applicable only when water is chlorinated. Tested at consumer end. When protection against viral infection is required, it should be minimum 0.5 mg/l
xii)	Iron (as Fe), mg/l, Max	0.3	No relaxation	IS 3025 (Part 53)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
xiii)	Magnesium (as Mg), mg/l, Max	30	100	IS 3025 (Part 45)	—
xiv)	Manganese (as Mn), mg/l, Max	0.1	0.3	IS 3025 (Part 59)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
xv)	Mineral oil, mg/l, Max	0.5	No relaxation	Clause 6 of IS 3025 (Part 39) infrared partition method	—
xvi)	Nitrate (as NO ₃), mg/l, Max	45	No relaxation	IS 3025 (Part 34)	—
xvii)	Phenolic compounds (as C ₆ H ₅ OH), mg/l, Max	0.001	0.002	IS 3025 (Part 43)	—
xviii)	Selenium (as Se), mg/l, Max	0.111	No relaxation	IS 3025 (Part 56) or IS 15303*	—
xix)	Silver (as Ag), mg/l, Max	0.1	No relaxation	Annex J of IS 13428	—
xx)	Sulphate (as SO ₄), mg/l, Max	200	400	IS 3025 (Part 24)	May be extended to 400 provided that Magnesium does not exceed 30
xxi)	Sulphide (as H ₂ S), mg/l, Max	0.05	No relaxation	IS 3025 (Part 29)	—
xxii)	Total alkalinity as calcium carbonate, mg/l, Max	200	600	IS 3025 (Part 23)	—
xxiii)	Total hardness (as CaCO ₃), mg/l, Max	200	600	IS 3025 (Part 21)	—
xxiv)	Zinc (as Zn), mg/l, Max	5	15	IS 3025 (Part 48)	—

NOTES

1 In case of dispute, the method indicated by * shall be the reference method.

2 It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.



DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE, ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.

Table 6.5: Noise Level Standards

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 energy mean of the noise level over a specified period.

Table 6.6: Permissible Noise For Industrial Workers As Laid Down By CPCB

Exposure time (in hr. per day)	Limit in dB(A)
8	90
4	93
2	96
1	99
½	102
¼	105
1/8	108
1/16	111
1/32	114



Table 6.7: Permissible Peak Particle Velocity (PPV) In Mining Areas

In mm/sec.

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

The above said monitoring 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.

6.4 ENVIRONMENTAL MONITORING COST:

Towards environmental monitoring it is proposed to allocate a budget of Rs. 50,000 per annum for this project. Further details of the capital and recurring cost of environmental management has been provided in in Table No. 10.2, Chapter-X.



CHAPTER - VII

ADDITIONAL STUDIES

CHAPTER 7 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
3. Cumulative Impact Study
4. R&R Plan
5. Mine closure planning

7.2 PUBLIC CONSULTATION:

This draft EIA/EMP report will be exposed to public consultation as per mandatory procedures through the District Collector and State Pollution Control Board officials after giving 30 days advance notice in two local newspapers about the scheduled date and time for conduct of the public hearing procedures. The opinions, concerns and objections of stakeholders will be recorded during the public hearing. All the public queries and the replies to the query by the project proponent and officials concerned will be recorded and incorporated in the EIA/EMP report for approval by SEIAA, Tamil Nadu.

7.3 RISK ASSESSMENT:

For the various risks, likely to arise, detailed analysis of causes and control measures is given in below:

S.No	Factors	Causes of risks	Control measures
1.	Removal of material	a) Bench may slide due to its unconsolidated nature. b) Vibration due to movement of vehicles in the benches.	Overall bench slope angle will be maintained optimally as per DGMS requirement. Working bench width will be more than bench height.
2.	Drilling	a)Due to high pressure of compressed air hoses may burst. b) Down the hole drill rod	• Periodical preventative maintenance and replacement of worn out accessories in the compressor and drill equipment.



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

S.No	Factors	Causes of risks	Control measures
		may break due to improper maintenance of rod.	<ul style="list-style-type: none"> As per manufacturers recommendation rod to be replaced and bits will be changed.
3.	Blasting	a) Fly rock, ground vibration, noise etc. b) Improper charging of explosives	<ul style="list-style-type: none"> Burden and spacing will be kept optimum on trial basis. Explosive charge per delay will be minimized. Controlled blasting with Nonel will be used.
4.	Excavation	a) Hauling and loading equipment are in such proximity while excavation b) Swinging of bucket over the body of tipper c) Driving of unauthorized person	<ul style="list-style-type: none"> Operator shall not operate the machine when person & vehicles are in such proximity. Shall not swing the bucket over the cab and operator leaves the machine after ensuring the bucket is on ground. Shall not allow any unauthorized person to operate the machine by effective supervision.
5.	Transportation	a) Operating the vehicle "nose to tail" b) Overloading of material c) While reversal & overtaking of vehicle d) Operator of truck leaving his cabin when it is loaded	<ul style="list-style-type: none"> It will be ensured that all these causes will be nullified by giving training to the operators. No over loading will be done. Audio visual reverse horn will be provided. Proper training will be given.
6.	Fire due to electricity and Oil	a) Due to the short circuit of cables & other electrical parts b) Due to the leakage of inflammable liquid like diesel, oil etc.	<ul style="list-style-type: none"> Electrical parts shall be cleaned frequently with the help of dry air blower. All fastening parts and places will be tightening. Suitable fire suppression equipment shall be provided.
7.	Natural calamities	Unexpected happenings	The mine management is capable to deal with the situation.

This being a small rough stone project that too working in a safe area, no major disaster is expected.



7.3.1. DISASTER MANAGEMENT PLAN:

In General, 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

Mining operation in this lease will be carried out under the management control and direction of a qualified mine manager. 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. All these orders statutory rules and regulations will be followed. Seismically project site and study area falls in the Zone – II and is described as least active zone. There are no perennial water body near the lease area to cause any flooding. As such no disaster due to this project is envisaged.

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.
- Avoiding mining during heavy monsoon period and marching of all the HEMM to the top benches during rainy period.
- 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 regulations will be strictly followed during all mining operations
- Prohibiting entry of unauthorized persons.
- Provision of Firefighting and first-aid provisions in the mines.
- 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 regularly
- Proper storage, usage of explosives through competent persons.
- 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 and the EMC will be able to deal with the situations efficiently keeping in view of the likely sources of dangers in the mine.

7.4 REHABILITATION AND RESETTLEMENT (R & R) PLAN:

The mining activities will be carried out within the mine lease area only. The entire mine lease area is a Patta land. There is no population within the ML area. Hence, the question of R& R does not arise.

7.5 MINE CLOSURE PLAN:

In the mine closure stage all necessary measures will be taken as per Act & Rules, There is no proposal for back filling, reclamation and rehabilitation. The quarried pits after the end of life of mine will be properly fenced all around to prevent inherent entry of public and cattle and all the statutory requirements will be fulfilled. As already explained, in the post mining stage the rainwater harvested in the mined out void shall be utilized for irrigation and domestic needs locally. The mine closure plan is provided in **Figure 4.5**.



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

7.6 CUMULATIVE IMPACT STUDY:

The lease area is located in Sundakottai Village, Aruppukottai Taluk, Virudhunagar District, Tamil Nadu. The details of the other quarries located within the 500m radius of the project considered for cumulative impact study now (**Annexure-3**) has been provided below:

Table 7.1: Details of quarries within 500m radius

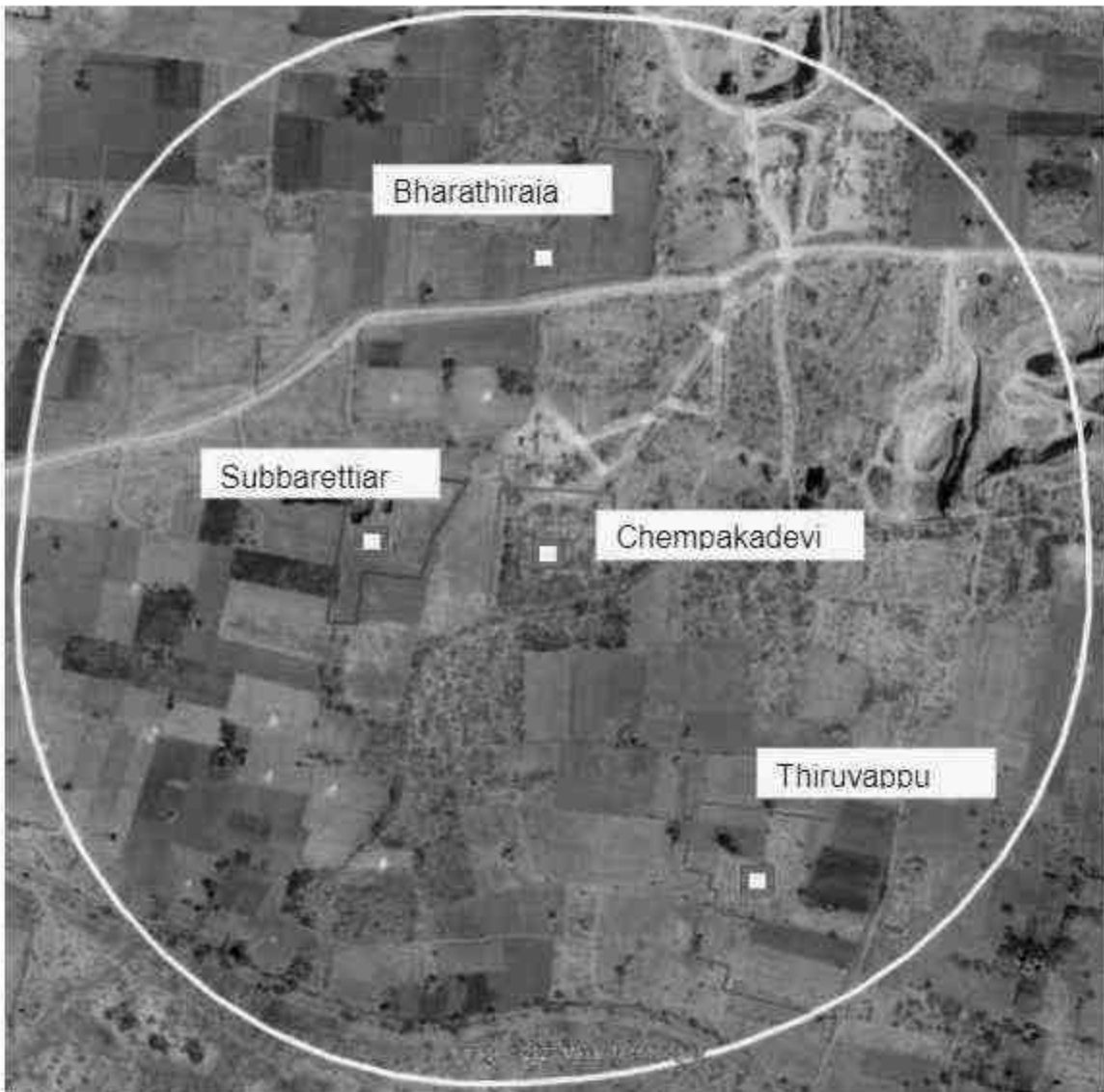
S.No	Name of the Owner	Village & S.F.Nos.	Proceedings and Lease Period
Existing Quarries			
1.	Thiru T.R.Varatharajan, No 54, Great Cotton Road, Aruppukottai Taluk, Virudhunagar District	Sundakottai 53/4, 53/5A (1.40.5)	KV1/11431/2016 dated 05.01.2017 18.01.2018 to 17.01.2023
2.	Thiru T.R.Varadharajan, 1, Ramasamy Nayakkar Street, Aruppukottai	Sundakottai 48/12, 48/13, 48/14, 50/2 etc. (2.22.5)	KV1/737/2018 dated 12.05.2022 17.05.2022 to 16.05.2027
Abandoned Quarry			
1.	Thiru M.Jesumuthu, S/o. Mariyaraj, D.No.1/99, Aladipatti Village Post, Aruppukottai Taluk, Virudhunagar District	Sundakottai 52/3, 52/5 (1.25.00)	KV1/28706/2014 Dated 03.03.2016 14.06.2016 – 13.06.2019
2.	Thiru B.Bose Tavasiyana Thevar, S/o. Pandi Thevar, Semponneruncheri Village, Thiruchuli Taluk, Virudhunagar	Sundakottai 3/4B, 3/5B, etc. (2.31.50)	KV1/1310/2009 dated 03.03.2016 14.06.2016 to 13.06.2019
3.	Thiru T.R.V.Ramkumar S/o. T.R.Varadharajan, Door No.54, Great Cotton Road, Aruppukottai Taluk, Virudhunagar District	Konganakurichi 113/1, 113/2, etc. (1.17.00)	KV1/74/2012 dated 11.07.2014 11.09.2014 to 10.09.2019
Present Proposed Quarry			
1.	Tmt.R.Chempaka Devi W/o.T.R.Varadharajan, No.1 Ramasamy Naicker Street, Vadugarkottai, Aruppukottai Taluk, Virudhunagar	Sundakottai 44/1(P), 44/5(P), 44/6, 44/7, 44/8 (1.50.00)	KV1/878/2018 dated 26.08.2022
2.	Thiru M.Thiruvappu S/o. Munisamy, Devarkurichi Village, Kadaladi Taluk, Ramanathapuram District	Sundakottai 64/3A, 64/3B, 64/3D, 65/2A, 65/2B, 65/3A (3.40.50)	KV1/666/2020 dated 24.11.2020
3.	Thiru K. Bharathiraja S/o. Krishnan 7-8M-33, Ajeesh Nagar, Aruppukottai Post and Taluk	Sundakottai 112/6A, 112/7A (2.41.0)	KV1/531/2020 dated 28.09.2020
4.	Thiru S.K.Subbarettiar 99, Keelakaranthal Kamatchi Chettiar Street, South Street, Aruppukottai Taluk.	Sundakottai 46/1, 46/2, 46/3, 46/4 (1.29.5)	KV1/245/2020 dated 07.10.2020



DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE, ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.

From that above it is seen that, although the individual lease area of this project is less than 5 Ha, the other existing and proposed quarries within the 500m radius along with this subject project works out to >5 Ha. As such cluster situation applicable and this EMP is prepared. A map showing the existing and proposed quarries located near the lease area is provided Figure No.7.1 given below:

Figure 7.1: Vicinity Map



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

Table 7.2: Salient details of the proposed quarries

S.No	Project Name	Bharathiraja	Subbarettiar	Thiruvappu	Chempakadevi
1	Survey No.	112/6A and 112/7A	46/1, 46/2, 46/3 & 46/4,	64/3A, 3B, 3D, 65/2A, etc.	44/1(P), 44/5(P), 44/6, 44/7, 44/8
2	Village	Konganakkurichi	Sundakottai	Sundakottai	Sundakottai
3	Taluk	Aruppukottai	Aruppukottai	Aruppukottai	Aruppukottai
4	District	Virudhunaga	Virudhunagar	Virudhunagar	Virudhunagar
5	State	Tamil Nadu	Tamil Nadu	Tamil Nadu	Tamil Nadu
6	Lease Area	2.41 Ha	1.29.5 ha	3.405 Ha	1.50.0 Ha
7	Precise Area Letter No.	KV1/531/2020- Kanimum dated 01.02.2021	Na.Ka.KV1/245/2020 Mines dated 09.11.2020	KV1/666/2020 gated 08.01.2021	KV1/878/2018- Minerals dated 26.08.2022
8	Production Capacity	10 years - 1,05,480 m ³ of Rough Stone and 18,032 m ³ of Gravel	Rough stone- 94318 m ³ Gravel-69,000 m ³	Rough stone- 623385m ³ Gravel-48210m ³	Roughstone- 1,50,675 m ³ Gravel-69,000 m ³
9	Method of mining	Opencast mechanized mining	Opencast mechanized mining	Opencast mechanized mining	Opencast mechanized mining
10	Lease Period	10 years	5 Years	10 Years	5 Years
11	Ultimate Depth	5 years – 12m 10 years – 32m	31 M	47M	41 M
12	Project cost	Rs.29,83,000	Rs. 52,16,620/-	Rs. 55,00,000/-	Rs. 50,14,760/-
13	CER budget	Rs 5,00,000/-	Rs 5.0 Lakhs	Rs 5.0 Lakhs	Rs 5.0 Lakhs

The cumulative combined impact anticipated due to mining and allied activities in both the proposed quarries are determined for Air, Noise, Vibration, Water, Logistical, Socio Economic and Land Environment. Details of the same are provided below:

7.6.1 AIR ENVIRONMENT:

The mining and allied activities particularly excavation, hauling, loading and un loading etc. lead to emission of particulate matter. However, effective mitigative measures are provided in the EIA/EMP report to obviate these effects. The cumulative impact on ambient air quality for PM₁₀ and PM_{2.5} due to the operations of both these proposed projects are predicted based on Air



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Quality Model simulations The modeling is done for the peak production to know the worst scenario. The cumulative peak Ground Level Concentration (GLC) after effective implementation of various mitigative measures have been computed and given below:

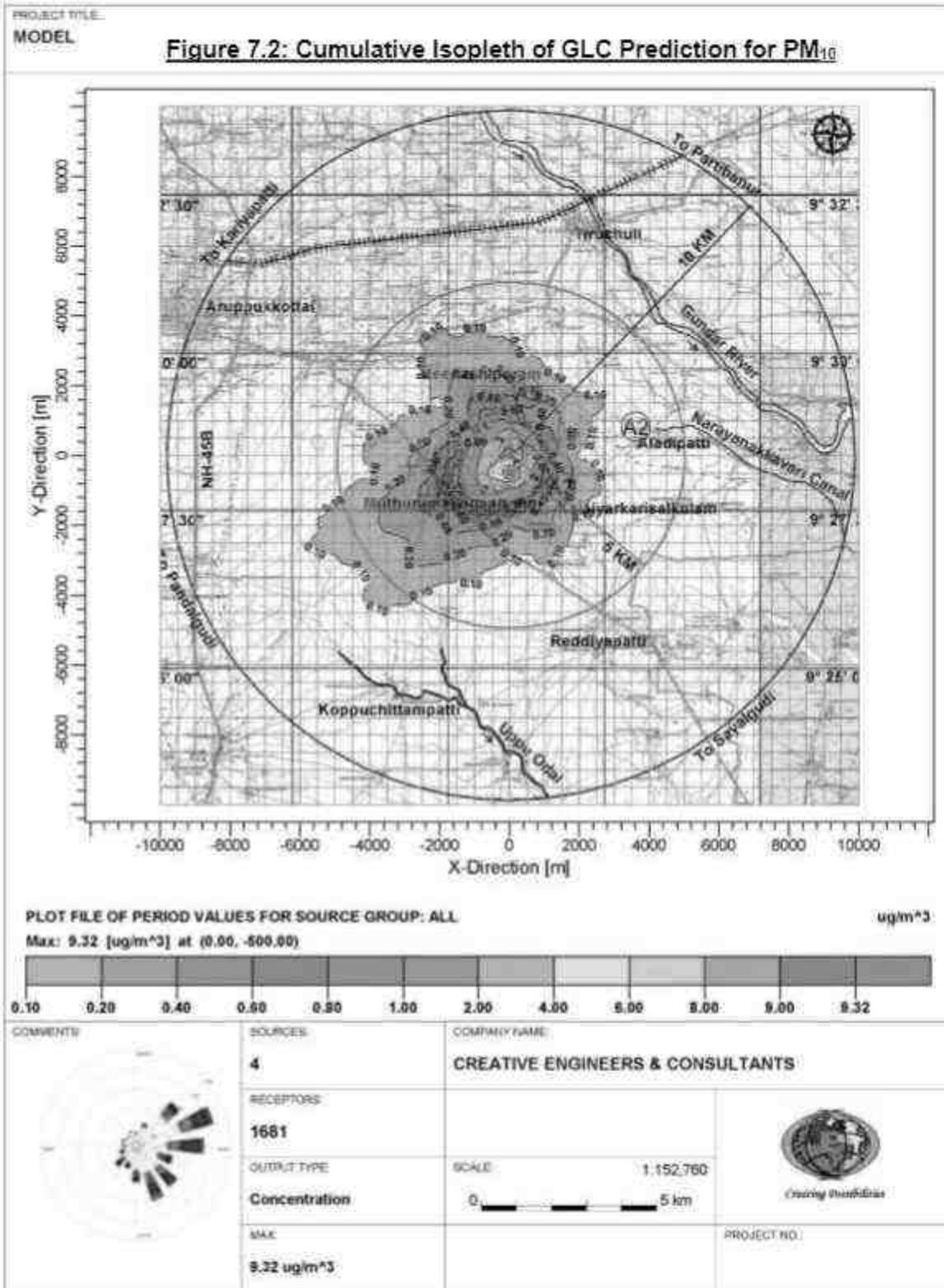
Table 7.3: Cumulative Peak Incremental Concentration

Activity	With Control Measures ($\mu\text{g}/\text{m}^3$)
PM ₁₀	9.3
PM _{2.5}	4.5

The cumulative isopleths of PM₁₀, PM_{2.5} concentrations have been drawn and these are given in Figure No – 7.2 to 7.3.



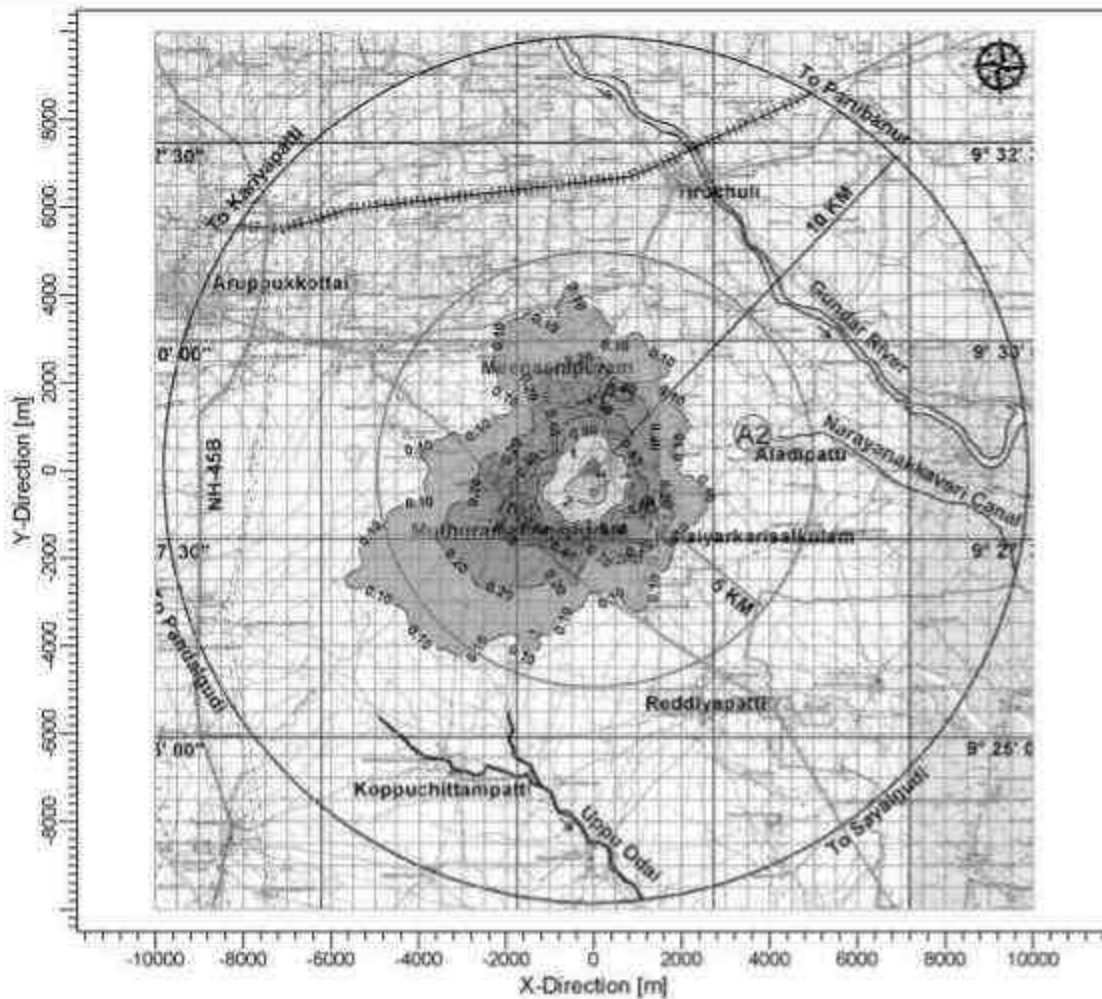
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PROJECT TITLE
MODEL-PM2.5

Figure 7.3: Cumulative Isopleth of GLC Prediction for PM_{2.5}



PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL

ug/m³



	SOURCES 4	COMPANY NAME CREATIVE ENGINEERS & CONSULTANTS	
	RECEPTORS 1681		
	OUTPUT TYPE Concentration		
	MAX 4.56 ug/m³	SCALE: 1:148,070 	PROJECT NO:

AERMOD View - Lakes Environmental Software



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It is observed that the peak incremental concentration for PM₁₀, PM_{2.5} is occurring very near the source. At away from the source the values are getting reduced due to dispersion effects. The incremental and predicted concentrations at the locations of ambient air quality have been discussed below.

7.6.1.1 PREDICTED AMBIENT AIR QUALITY:

The cumulative combined post project Concentrations of PM₁₀, PM_{2.5} (GLC) (base line + incremental) after adopting necessary control measures is given below:

Table 7.4: Concentrations of PM₁₀ after Project Implementation

Values in µg/m ³					
S. No	Location	Background Concentration	Predicted Incremental Concentration	Post Project Concentration	Statutory Limits
1	Near Mine Lease Area	58.6	9.3	67.9	-
2	Aladipatti Village	69.6	1.0	70.6	100
3	Kalaiyarkarisalkulam Village	52.8	1.5	54.3	
4	Muthuramalingapuram Village	49.1	2.0	51.1	
5	Meenashipuram Village	54.4	1.0	55.4	

Table 7.5: Concentrations of PM_{2.5} after Project Implementation

S. No	Location	Background Concentration	Predicted Incremental Concentration	Post Project Concentration	Statutory Limits
1	Near Mine Lease Area	27.9	4.5	32.4	-
2	Aladipatti Village	33.1	1.0	36.1	60
3	Kalaiyarkarisalkulam Village	24.0	1.0	25.0	
4	Muthuramalingapuram Village	22.7	1.0	23.7	
5	Meenashipuram Village	24.8	1.0	25.8	

It can be seen that the resultant added concentrations with baseline figures even at worst scenario and cumulative impact of the projects show that the values of ambient air quality with respect to PM₁₀ are in the range of 51.1 µg/m³ to 70.6 µg/m³ and with respect to PM_{2.5} are in the range of 23.7 µg/m³ to 36.1 µg/m³ which are within the statutory stipulations in respective case.

7.6.2 WATER ENVIRONMENT:

The water requirement for all the projects is 40KLD. Though it may be sourced from outside agencies initially, for these projects it is planned to use the rain water collected in the mine



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sump later. Groundwater intersection is not envisaged due to both the quarrying operations. Besides, the stage of groundwater development in Aruppukottai Taluk based on technical report of the Central Ground Water Board, South Eastern Coastal Region – 'District groundwater brochure, Virudhunagar District.' is categorized as 'Safe' thus proving that there is further scope for groundwater development. Hence, no major impact is expected on groundwater regime due to the cumulative project operations.

7.6.3 NOISE ENVIRONMENT:

Post project noise in the core zone has already been provided under para 4.4, Chapter-IV where it is seen that the predicted Noise Levels due to mining operations at the periphery of the mine lease itself will be less even without considering any attenuation factor. However, practically there will be attenuation due to vegetation etc., and as such there will not be any adverse noise propagation outside the lease boundary. Hence, the cumulative post project noise in the nearby villages has been carried out using the following formula and the results are given below:

$$Lp2 = Lp1 - 20 \log R2/R1$$

Where, Lp1 and Lp2 are sound pressure levels at points located at distances R1 and R2 respectively from the source.

Table 7.6: Post project noise levels

S.No	Location	Baseline Day Eq.in dB(A)	Post project noise Eq in dB(A)	Limit dB(A) as per MoEF&CC
1	Aladipatti Village	49.8	50.6	55
2	Kalaiyarkarisalkulam Village	48.9	52.5	55
3	Muthuramalingapuram Village	47.7	49.8	55
4	Meenashipuram Village	44.9	46.3	55

7.6.4 VIBRATION:

By Carrying out controlled blasting using Nonel milli second delay detonator, Optimum design for burden and spacing & reducing the explosive charge per delay to minimum in both the projects no adverse impact due to blasting vibration is expected.



7.6.5 TRAFFIC:

The mined out minerals will be transported by means of trucks to the consumers like crusher units for producing stone aggregates of different sizes or construction of roads, bridges, buildings and other buyers etc. The cumulative impact on traffic due to transportation of minerals from both these leases are provided below:

Table 7.7: Cumulative number of trips

Details	Bharathiraja	Subbarettiar	Thiruvappu	Chempakadevi
Maximum Roughstone Transported (m ³ /year)	19,976	20,240	1,30,933	30,800
No of days in a year	300	300	300	300
Transport hours per day	8	8	8	8
Truck capacity in T	20	20	20	20
Trips per hour	2 Trips/hr	2 Trips/hr	8 Trips/hr	3 Trips/hr

The total trips from these projects there will be hardly about 15 trips per hour. The existing road can absorb this traffic due to this project. Various measures like proper maintenance of road, covering of the loaded truck with tarpaulin, water sprinkling will be carried out to ensure no adverse impact on the logistical front.

7.6.6 LAND ENVIRONMENT:

K. BHARATHIRAJA lease area of 2.41.0 Ha is a patta land in the name of the applicant. At the end of the post mining stage, 0.956 Ha of mined out area will be left as water body, 0.03 Ha will be the mine roads & infrastructure, 1.412 Ha will be covered with vegetation and 0.012 Ha will be undisturbed area.

TMT.R.CHEMPAKADEVI lease area of 1.50Ha is a patta land in the name of the applicant. At the end of the post mining stage, an area of 0.865 Ha of mined out area will be left as water body. 0.01Ha will be infrastructure, 0.02 Ha will be roads and 0.605 Ha will be covered with vegetation.

M .Thiruvappu lease area of 3.40.5 Ha is a patta land in the name of the applicant . At the end of the life of the mine, an area of 2.44 Ha will be left as water body, 0.15.5Ha will be roads & infrastructure, 0.80.10Ha will be greenbelt area and 0.00.90 Ha will be unutilized.

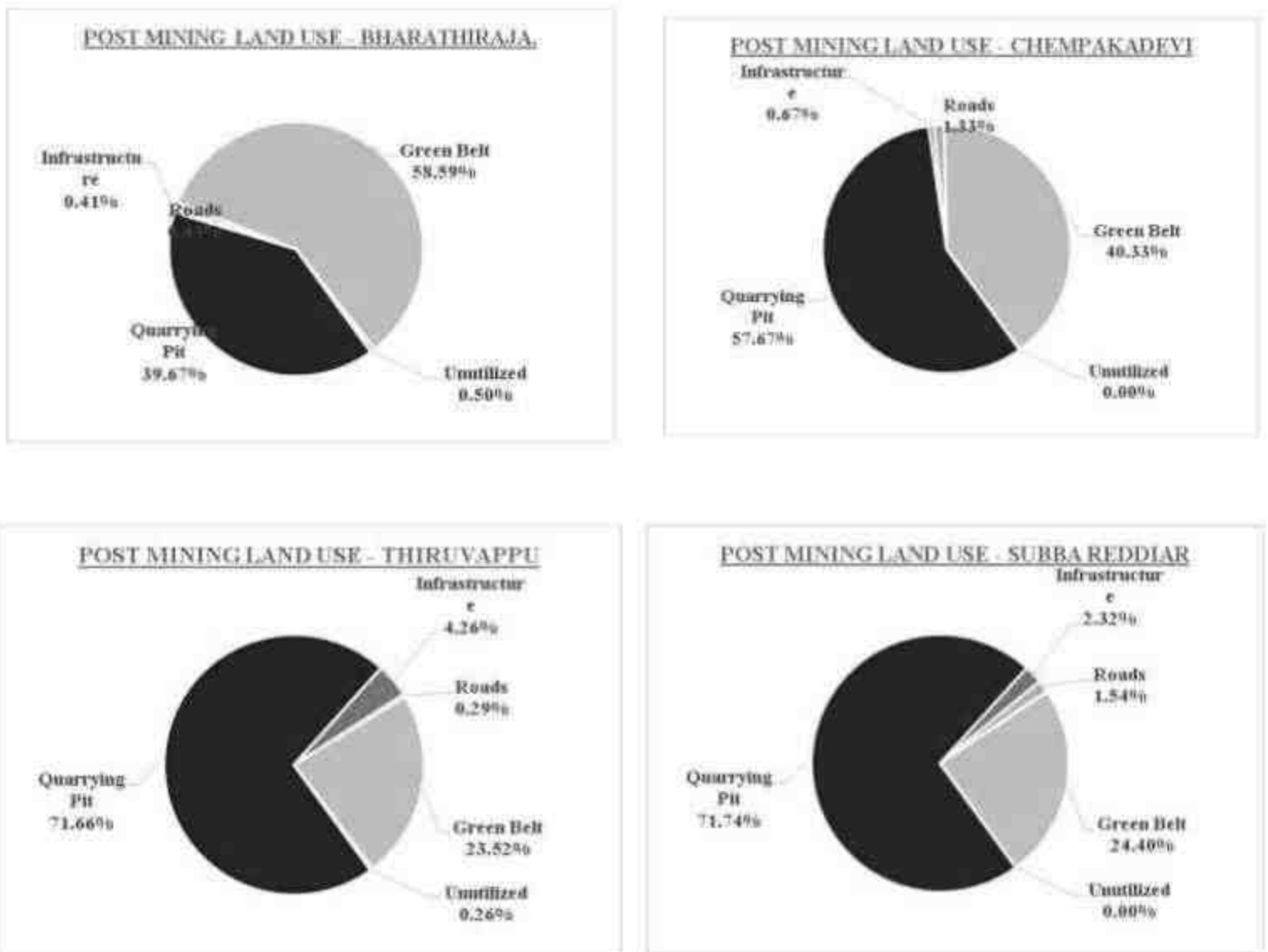
S.K.SUBBA REDDIAR lease area of 1.29.5 Ha is a patta land in the name of the applicant . At the end of the life of the mine, an area of 0.92.90 Ha will be left as water body, 0.05.0Ha will be

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roads & infrastructure, 0.31.60Ha will be greenbelt area.

For all the projects, in the post mining stage it will be ensured that the entire mined out area will be properly fenced to prevent inadvertent entry of men and animals. The rainwater harvested in the mined-out void shall be utilized to meet the water requirement.

Figure 7.4: Post Mining Land Use



7.7 PIT SLOPE STABILITY PLAN

- Factors affecting slope stability of the mine are
 - Geological structure comprising dip, intervening shear zone formation, clay intrusion, joints / discontinuities, faults etc.,
 - Lithology of formation
 - slope geometry
 - Ground water availability which may cause increased thrust on the faces
- Site specific analysis
 - Since the formation is of homogeneous rock type probability of slope failure is low and can be avoided if proper measures are adopted.
 - There will be a 7.5m wide barrier zone which will form a ridge which can also take care of the top section and as such no risk is envisaged on this front.
 - During future workings the following measures will be ensured:
 - Regular inspection of the mine faces to be carried out by mines manager for ensuring absence of any structural features like faults, joints, dyke, intrusive material in the rock strata which may affect the slope stability and cleared.
 - No loose material or boulders is to be stacked on the mine top or pit benches.
 - Height of the benches should be 5m. Working bench width should be at least 2.5 times the bench height. Ultimate pit bench width will be 5m & slope is kept at 45° to ensure slope stability.
 - Haul road formation will be at 1 in 16 slope with adequate road width.
 - There will be no ground water table intersection.
 - No seepage is expected due to formation. Adequate drainage management system comprising peripheral garland drain, settling pond to regulate monsoon water will be created to prevent saturation of compact layers, apparent drainage



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

over the bench slope to avert damages to quarry face and manage the water flow.

The above will ensure safe and stable mine prospects.

CONCLUSION:

No adverse impact on the surrounding environment is envisaged from this project due to enforcing all the mitigative measures during mining.

Certified vehicles with low carbon emissions will only be used. These equipment's will be properly and regularly maintained. Besides, regular vehicular emission tests will be done for the transport vehicles to ensure minimal impact due to carbon emissions. To further mediate the carbon emissions, a good greenbelt and plantation plan has been planned wherein 750 number of plants will be planted in and around the lease area.

Geologically the area in and around the lease area contains charnokite type rock formation containing mostly fallow land. As such there no major vegetation or agricultural activities are observed. There are no Protected or Eco-Sensitive Zone or forest land nearby wherein it can have an impact.

It will be ensured that mining will be carried out adhering to all the statutory rules and regulations, appointing statutory personnel's like qualified mines manager, blaster, informing DGMS before commencement of mining operations and maintaining the environmental quality within the prescribed standards by effective implementation of various mitigative measures.

As such release of Greenhouse gases (GHG), rise in temperature, affecting livelihood of the local people, loss of Agriculture, Forestry and Traditional Practices is not envisaged. Such a limited scope will not induce any climatic change leading to droughts, floods etc.

Mine closure plan is prepared for the lease period and already included in the approved mine plan.

Due to absence of perennial water bodies nearby where in any marine ecosystem is observed, no effect on this front is also expected. Hydrological investigation carried out and as given in Para 3.6 of Chapter III & para 4.3 Chapter – IV shows that the all-time ground water table in this area is much below the mining level. Hence, ground water intersection is not envisaged for the entire life of the mine and ground water will not be affected due to the quarrying operation.



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

As such there will not be any adverse impact on the ground water regime. Besides, this being a mining project, there will be not be any process effluent. As mentioned earlier, the rainfall will be collected in the mine floor sump and gainfully used as per CGWA requirement. Excess water if any in the sump will be pumped to settling pond and supernatant clear water let out for downstream users.

It will be ensured that mining will be carried out adhering to all the statutory rules and regulations, appointing statutory personnel's like qualified mines manager, blaster, informing DGMS before commencement of mining operations and maintaining the environmental quality within the prescribed standards by effective implementation of various mitigative measures for the entire lease period.



CHAPTER - VIII

PROJECT BENEFITS

CHAPTER 8 PROJECT BENEFITS

The proposed Roughstone and Gravel Quarry of Tmt.R.Chempakadevi will improve physical and social infrastructures in the area like:

- Direct employment to 20 people.
- Indirect employment to scores of people.
- Financial gains for the governments, through collection of various taxes like royalty, GST, etc.,
- Increase in General Awareness of the People.
- Continual improvements of the local amenities for the local society
- 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.
- Improvement in Per Capita Income.
- Providing certain facilities for the local schools and panchyats

In short, the proposed Rough Stone Quarry will benefit this region in the fields of employment opportunities, improved per capita income for local people, improved social welfare facilities in respect of education, medical systems, infrastructural build-up, etc in its own way.

By means of carrying out the socio-economic development activities, local community development is expected. Towards the same, the proponent has planned to allocate Rs.5.0 Lakhs for various activities under CER. From the CER activities allocated for various social welfare activities, the villages near the lease area will be benefited.



CHAPTER - IX

ENVIRONMENTAL COST BENEFIT ANALYSIS

CHAPTER 9

ENVIRONMENTAL COST BENEFIT ANALYSIS

Appendix-III of the MoEF notification S.O. 1533 dated 14.09.2006, which describes the generic structure of Environmental Impact Assessment document, states that the chapter 'Environmental cost benefit analysis' is applicable if it is recommended during scoping stage.

ToR for this project has been received from SEIAA, Tamil Nadu vide their letter No. SEIAA-TN/F.No.10179/SEAC/ToR-1526/2023 dated 09.08.2023. Environmental cost benefit analysis is not prescribed in the terms of reference. Hence, it is not applicable for this project.



CHAPTER - X

ENVIRONMENTAL MANAGEMENT PLAN

CHAPTER 10

ENVIRONMENTAL MANAGEMENT PLAN

10.1 INTRODUCTION:

This chapter describes the implementation strategies of the environmental management measures described through the course of this EIA/EMP report for the purpose of mitigating significant impacts due to the proposed mining operations.

10.2 COMPONENTS OF THE ENVIRONMENTAL MANAGEMENT PLAN:

The environmental management plan comprises identification of the major impacts due to project operations and their suitable mitigative measures. (Provided in an elaborate manner in Chapter-IV) Based on the environmental policy of the company, the environmental management cell will oversee the implementation of these mitigative measures. The details of the proponent's environmental policy, environmental management cell and also the budgetary allocation towards various environmental management measures has been elaborated in this chapter.

10.2.1 ENVIRONMENTAL POLICY:

The proponent will frame a well-planned environmental policy. The salient features of this policy will be.

- ❖ Ensuring risk-free and safe mining operations by following all rules and conditions prescribed in the Indian mines Act, metalliferous mining regulation, mineral conservation and development rules, etc,
- ❖ Ensuring environmental preservation by adoption of remedial measures for control of air, water quality, noise status, biological improvements, green belt creation, etc,
- ❖ Extending CER activities to cater to the needs of local community for various benefits like improvement of physical and social infrastructures for the welfare of local community.



- ❖ Ensuring that all mining operations such as deployment of HEMM, conduct of drilling and blasting operations, etc are strictly conducted keeping with regulatory standards & maintaining safe working environment in the area.
- ❖ Providing periodical training on safety, Health, & Environment to all employers.
- ❖ 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 owner through upwardly hierarchical communicative channels from the lowest level to superior levels in a quick time bound duration.
- ❖ The mines manager will 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 owner of the quarry. Remedial measures for such violations and deviations should be taken 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 Mines manager of the mine in various issues like prescribed environmental monitoring schedules conducting of vibratory studies due to blasting, creation of green belt, management of mined area, occupational health review, etc.
- ❖ Penalty actions will be taken by the proponent in cases of continuous negligence resulting in violations deviations in this respect.
- ❖ A time schedule of once in 90 days for review of all operational factors as mentioned above is to be enforced, for proper and quick corrective actions needed in the matter.

10.2.2 ENVIRONMENTAL MANAGEMENT CELL:

The Mines Manager/Mine Incharge 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 programme, social development schemes, etc in the mine. The organizational chart for the same has been provided below:

Figure 10.1: Organization Chart



The Mines Manager/Mines Incharge in the mine project site will be directly responsible for various environmental activities in the mine. The owner will correlate and oversee the environmental activities and their effective implementation in consonance with the guidelines in the EMP. The Mines Manager/Mines Incharge will oversee the environmental administration at the mine and he will directly supervise all activities of environmental administration on environmental issues. Necessary assistance from sub ordinates, external consultants and laboratories shall be taken.

Environmental control measures will span various factors like land degradation, air, water and soil quality, noise levels, effective land reclamation for excavated areas, afforestation measures, etc. The administrative functions are given below.

- ❖ To observe the implementation of environmental control measures.
- ❖ To study the effects of project activities on the environment.
- ❖ To ensure implementation of Plantation Programme. Regular monitoring of survival rate of plants is carried out to achieve the desired result.



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- ❖ To keep records of monitoring etc., in a systematic way, so as to facilitate easy access, when needed by statutory agencies, etc. Also send prescribed returns to statutory authorities.
- ❖ To ensure that adequate fencing and plantation is carried out in the safety zones.
- ❖ Conducting environmental studies and reporting to SPCB.
- ❖ To interact and liaise with Government Departments.
- ❖ To evaluate the performance of existing pollution control equipment and systems periodically and take timely action to keep the equipment at its optimum performance condition.
- ❖ To take immediate preventive action in case of some unforeseen environmental pollution attributable to the project.
- ❖ Conducting safety audits and programmes to create safety awareness in workers/ staff.
- ❖ Conducting annual health audits to detect any health problems promptly in the workers/staff. This will reduce occupational health problems.
- ❖ Imparting training on safety and conduct safety drills to educate employees. Firefighting equipment and system has to be kept in 'ready-to-fight' condition.
- ❖ Carrying out socio economic study in the surrounding areas to find out the benefits derived by the society due to the project and also to fulfill the deficiency, if any, immediately.
- ❖ Ensuring proper mine closure arrangements.

Considering the other mines in the cluster, the Environmental Management Cell of this project will also act as a Cluster Management Committee. The various activities undertaken to be undertaken by this committee are detailed below:

- Effective implementation of the environmental management measures in a holistic manner
- Devising an operation plan for mining and transportation activities.



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- Various natural calamities like rain, flooding, evacuation plans etc. will also be deliberated by this committee to form risk management and emergency management plan pertaining to the cluster.
- The environmental policy of the company will be implemented and proper sustainable mining in accordance with statutory regulations will be enforced for the quarries in the cluster.
- Furnishing action plan regarding restoration strategy
- Deliberate on the health of the workers involved in the mining and also the health of the public
- Carrying out detailed study on the impact of mining on:
 - Soil health & biodiversity
 - Climate change leading to droughts, floods, etc.
 - Pollution leading to release of greenhouse gases (GHG) rise in temperature and livelihood of local people
 - Possibilities of water contamination and impact on aquatic ecosystem health.
 - Agriculture, Forestry & Traditional practices.
 - Hydro geothermal /Geothermal effect due to destruction in the Environment.
 - Bio-geochemical process and its footprints including environmental stress.
 - Sediment geochemistry
- Furnishing action plan to achieve sustainable development goals with regards to water, sanitation and safety.
- Furnishing fire safety and evacuation plans in case of fire accidents.
- Implementation of steps to effectively utilize energy.



10.2.3 ENVIRONMENTAL MANAGEMENT PLAN:

10.2.3.1 General:

Systematic monitoring systems and well-conceived and efficient Environment Management Plan will ensure that during the project operations, the various environmental parameters, are well within the statutorily sustainable limits. The environmental control measures proposed to keep various environmental parameters of the project in terms of air, water, noise, land, biological environment, etc. has been described below.

10.2.3.2 Air Quality:

With regards to air quality, to mitigate the fugitive and gaseous emission resulting from mining and allied activities, the following control measures are proposed to be undertaken:

- Regular water sprinkling in the transport roads using mobile tankers for dust suppression.
- Controlled blasting techniques with NONEL.
- Provision of dust filters / mask to workers working at highly dust prone and affected areas.
- Covering of drill holes with wet cloth, using sharp drill bits.
- Avoiding blasting during high wind periods where the fine dust is carried out away easily affecting the ambient air quality.
- Proper maintenance of haul roads, HEMM and dumpers.
- Covering of loaded tippers with tarpaulins during transportation.
- Vehicular emissions will be controlled through regular and proper preventive maintenance schedules and emissions tests are done with diesel smoke meter equipment to ensure emission values.
- Besides, there will be good green belt cover will be developed around mine periphery and in safety zone.
- Green netting will be carried out around the lease periphery on all sides.



10.2.3.3 Water Environment:

There will be no process effluent generated from this project. The domestic sewage to be generated will be collected in septic tank with soak pit arrangements. Besides, there will be no waste dumps or stockpiles within the lease area as the entire material will be directly despatched to the consumers.

Surface runoff management structures such as garland drain connected to a settling pond will be constructed around the quarry to collect the rain water. The supernatant clear water from the settling pond will be provided to nearby downstream users. Towards rainwater harvesting, the rainwater harvested in the mine will be used to meet the water requirements during mining and excess water in consultation with villagers and in line with government practices will be out in to the nearby stream or shall be distributed to the nearby villages as per their need.

There is a tank located on the northern side of the lease area for which 50m safety distance has been left. There is no proposal to discharge any effluent into this waterbody. No major impact is envisaged on the nearby water bodies due to project operations.

10.2.3.4 Noise Environment:

During the project operations, various control measures as listed below will be carried out to mitigate adverse impact due to the noise generated due to mining and allied activities:

- Good plantation will be carried out in the safety zone areas
- Noise protectors, insulation of operator cabins, installation of silencers in machineries, etc.
- Proper and regular maintenance of equipments
- Providing earplugs to workers exposed to higher noise level.
- Providing in-built mechanism for reducing sound emissions.
- 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.



10.2.3.5 Ground Vibration

During the project operations, various control measures as listed below will be carried out to mitigate adverse impact due to the ground vibration caused due to blasting activities:

- ❖ Controlled blasting techniques to maintain the peak particle velocity (PPV) below DGMS prescribed levels.
- ❖ Ideally formulating drilling and charging pattern and ensuring using less charge per delay.
- ❖ To contain fly rocks, stemming column will not be less than burden of the hole. Blasting area will also be muffled, if necessary, to stop fly rocks propagation.
- ❖ Blasting will not be carried out when strong winds are blowing towards the inhabited areas. Blasting will be done during midday time and never at night.
- ❖ Proper care and supervision during blasting by a competent and experienced person.
- ❖ Besides, different blasting time for the projects in the vicinity is suggested and the timing is to be mentioned in the display board in the respective mines entrance.

Further details regarding the same has been provided under section 4.4.2, Chapter-IV.

10.2.2.6 Biological Environment:

The mining lease area and 10km buffer zone are devoid of declared ecologically sensitive features such as national parks, sanctuaries etc. Besides, no Schedule-I animals are observed in the core and buffer zone. There will be no major clearance of vegetation involved in this project. However, good greenbelt and plantation programmes are planned within the lease area.

In the lease area, safety barrier 7.5m around the periphery and 10m safety zone for the Odai on the southern side of the lease area. About 750 trees will be planted in and around the lease area. Greenbelt / Plantation will be carried out to enhance the vegetative growth and aesthetic in the safety zone area. This will boost the biological, visual and aesthetic outlook of the area. Elaborate details regarding the same is provided under section 4.6.4, Chapter-IV.



10.2.2.7 Socio-Economic Environment:

The proposed project operation will provide positive impacts in the region on the employment area as well as on physical and social infrastructural status. Many other tangible benefits will be gained by the local people in the surrounding areas due to ancillary units, trading operations, contractual needs, casual labor, green belt development, etc. Towards the socio economic development of the surrounding area, the proponent has earmarked an amount of Rs.5.0 Lakhs under Corporate Environmental Responsibility. The activities identified under CER will be implemented in a phased manner.

10.3 ENVIRONMENTAL POLLUTION CONTROL COST:

In this proposed quarry Implementation of environmental control measures as stated above involves capital as well as recurring expenses. The probable capital and recurring environmental control cost are calculated and given below **Table No – 6.5**

Table 10.1: Environmental Control Cost

S. No	Mitigation Measure	Rs. In lakhs	
		Capital cost	Recurring Cost /Annum
Air Environment			
1	Water sprinkling	8.00	0.50
2	Installing wheel wash system near gate of quarry	0.50	0.20
3	Muffle blasting – To control fly rocks during blasting	0.00	0.05
4	Wet Drilling with dust extraction	0.25	0.03
5	Environmental Monitoring	0.00	0.50
6	Transport Trucks -Monitoring exhaust fumes, covering with tarpaulin, monitoring manually with security guard to avoid overloading and installation of speed governors, Parking area with flaggers for traffic management	1.05	0.45
7	Road Maintenance - Haul road maintenancem Regular sweeping and maintenance of approach road	0.00	0.30
Sub-Total (A)		9.80	2.03
Noise Environment			
8	Controlled Blasting using NONEL, provision of blaster shed	0.50	3.82
Sub-Total (B)		0.50	3.82
Water Environment			
9	Surface Runoff Management Structures	0.15	0.05
Sub-Total (C)		0.15	0.05
Implementation of EC, Mining Plan & DGMS Condition			
10	Waste Management - Collection and Disposal	0.30	0.22
11	Fencing and Green Net Provision	3.00	0.10

DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE, ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.

12	Health and Safety - Provision of PPEs, IME, PME, First aid facility	0.80	0.46
13	Sign Boards -safety precaution signages, EC Conditions display board	0.20	0.03
16	Installation of CCTV cameras	0.30	0.05
17	Remuneration of statutory persons	0.00	7.80
Sub-Total (D)		4.60	8.66
Green Belt Development			
34	Plantation Inside the lease area(300 Nos.)	0.60	0.09
35	Plantation Outside the lease area (450 Nos.)	1.35	0.14
Sub-Total (E)		1.95	0.23
Grand Total		17.00	14.78

Towards EMP measures, Rs.17.00 Lakhs is allocated under capital cost. Besides, Rs.14.78 Lakhs per annum will be spent under recurring cost. All the recurring cost of maintenance of pollution control measures, environmental monitoring etc., will be met from revenue and will be spent for the entire lease period.

10.4 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-XI

SUMMARY AND CONCLUSION

CHAPTER 11

SUMMARY & CONCLUSION

11.1 INTRODUCTION:

Tmt.R.Chempakadevi proposes to operate a **Rough Stone and Gravel Quarry** over an area of 1.50.0 Ha in Sundakottai Village, Aruppukottai Taluk, Virudhunagar District, Tamil Nadu and has initiated action towards obtaining environmental clearance.

It is proposed to mine 1,50,675m³ of Roughstone and 69,600m³ of Gravel upto a total depth of 41m bgl during the lease period of 5 years. This is a fresh lease and as such no mining operations have been carried out here so far.

Although the individual lease area of this project is less than 5 Ha, the other existing and proposed quarries within the 500m radius cluster along with this subject project works out to >5 Ha. Hence, this proposal is considered under Category – B1 and as per MoEF & CC notification necessitates preparation of EIA/EMP report and public hearing.

This EIA/EMP report is prepared based on standard and additional Terms of Reference issued by SEIAA, Tamil Nadu vide letter no. SEIAA-TN/F.No.10179/SEAC/ToR-1526/2023 dated 09.08.2023 and is in conformance of the generic structure prescribed by MOEF&CC in their notification of September 2006 and the approved mining plan.

11.1.1 STATUTORY APPROVALS:

S.No	Statutory Approval	Authority	Letter Number and Date	Reference
1.	Precise Area Communication Letter	Assistant Director, Dep. of Geology & Mining, Virudhunagar	KV1/878/2018-Minerals dated 26.08.2022.	Annexure-1
2.	Mining Plan Approval	Assistant Director, Dep. of Geology & Mining, Virudhunagar	KV1/878/2018-Minerals dated 22.11.2022.	Annexure-2
3.	Details of other quarries within 500m radius	Assistant Director, Dep. of Geology & Mining, Virudhunagar	KV1/878/2018-Minerals dated 22.11.2022.	Annexure-3



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

11.1.2 ENVIRONMENTAL CLEARANCE APPLICATION:

Particulars	Details
Terms of Reference	Received from SEIAA, Tamil Nadu vide their Lr No.SEIAA-TN/F.No.10179/SEAC/ToR-1526/2023. Dated:09.08.2023
Baseline Data Collection	Carried out by Creative Engineers & Consultants , Chennai for Summer Season (March – May 2023)

11.2 SALIENT FEATURES OF THE PROJECT:

Table 11.1: Site Details

Location	Sundakottai village, Arupukottai Taluk, Virudhunagar District, Tamil Nadu
Survey No.	44/1(P), 44/5(P), 44/6, 44/7, 44/8
Coordinates	Latitude: 09°28'21.10" N to 09°25'30" N Longitude: 78°10'57.95"E to 78°11'00.00"E
Nearest Highway	(NH-45B) - 8.8Km- (NW)
Nearest Village	Aladipatti - 1.7 km – (NE)
Nearest Town	Arupukottai – 10km - NW
Nearest Railway Station	Arupukottai – 10km - NW
Nearest Airport	Madurai- 42km – N
Topography	Plain terrain, dry lands with scarce vegetation.
Accessibility	The lease area can be approached from Alangbhatti to Kallorani Road on the northern side of the lease area at a distance of 0.20Km. This road joins SH-47 on the eastern side of the lease area at a distance of 2.2Km.
Drainage	There is a drainage channel on the southern side of the lease area for which safety distance of 10m has been left.

Table 11.2: Environment Setting of The Study Area

S.No	PARTICULARS	DETAILS
1	Nearest highway	(NH-45 B) – 8.8km (NW)
2	Nearest Railway station	Arupukottai RS – 10km - NW
3	Nearest Airport	Madurai – 42Km – N
4	Nearest major water bodies	<ul style="list-style-type: none"> ➤ Gundar River-6.0km – (NE), ➤ Narayanakkaveri Canal – 5.5km – (E), ➤ Uppu Odai – 6.0km – (SW)
5	Nearest town/City	Arupukottai – 9.5km – (NW)



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

S.No	PARTICULARS	DETAILS
6	Nearest villages	<ul style="list-style-type: none"> ➤ Aladipatti – 1.7km (NE) ➤ Kallorani – 2.1km (W) ➤ Kalaiyarkarisalkulam - 1.5km (S) ➤ Muthuramalingapuram - 1.9km (SW)
7	Notified Archaeologically important places, Monuments	Nil within 10m radius
8	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 10m radius
9	Reserved / Protected Forests	Nil within 10m radius
10	Defence Installations	Nil within 10m radius
11	Seismic Zone	Zone – II (Least Active)
12	Other Industries in the study area	Other than rough stone quarry & crushers there are no other major industries in the area.

Table 11.3: Technical Description

PARTICULARS	DETAILS																					
Geological reserve	Roughstone – 5,58,600m ³ , Gravel – 95,760m ³																					
Mineable reserve	Roughstone – 1,50,675m ³ , Gravel – 69,600m ³																					
Method of Mining	Open cast mechanized mining method with drilling, blasting, excavation, loading and transportation of Roughstone to needy buyers.																					
Production	<table border="1"> <thead> <tr> <th>Year</th> <th>Roughstone (m³)</th> <th>Gravel (m³)</th> </tr> </thead> <tbody> <tr> <td>I</td> <td align="center">30250</td> <td align="center">30600</td> </tr> <tr> <td>II</td> <td align="center">28375</td> <td align="center">10200</td> </tr> <tr> <td>III</td> <td align="center">30450</td> <td align="center">9600</td> </tr> <tr> <td>IV</td> <td align="center">30800</td> <td align="center">9600</td> </tr> <tr> <td>V</td> <td align="center">30800</td> <td align="center">9600</td> </tr> <tr> <td>Total</td> <td align="center">1,50,675</td> <td align="center">69,600</td> </tr> </tbody> </table>	Year	Roughstone (m ³)	Gravel (m ³)	I	30250	30600	II	28375	10200	III	30450	9600	IV	30800	9600	V	30800	9600	Total	1,50,675	69,600
	Year	Roughstone (m ³)	Gravel (m ³)																			
	I	30250	30600																			
	II	28375	10200																			
	III	30450	9600																			
	IV	30800	9600																			
V	30800	9600																				
Total	1,50,675	69,600																				
Waste Generation and Management	There is no waste generation anticipated in this quarry operation since the entire excavated material will be utilized. The top overburden in the form of Gravel and weathered rock will be loaded into tipper and marketed to needy customers on payment of necessary Fees to Government. The excavated rough stone will be excavated and loaded																					



DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE, ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.

PARTICULARS	DETAILS
	into tipper to the needy buyers for producing crusher aggregates, M Sand.
Ultimate Depth	41m
Man power	20 People directly and more than 50 people indirectly
Mode of transport	By Road
Water requirement	10 KLD
Source of water	The required water will be procured from outside agencies initially. Later, water collected in the mine pit will be used to meet the needs.
Power requirement	All the equipment will be diesel operated. No electricity is needed for mining operation. The minimum power requirement for office, etc will be met from state grid.
Life of the mine	5 Years
Project cost	Rs. 50,14,760/- (Including operational + Fixed Asset + EMP cost).

11.3 EXISTING ENVIRONMENTAL SCENARIO:

11.3.1 GENERAL:

The studies and data collection have been carried out systematically and meticulously as per relevant IS codes, CPCB and MoEF&CC guidelines and as per approved ToR during **Summer Season (March 2023 to May 2023)** 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, while buffer zone encompasses an area of 10 km radius distance from the periphery of core zone.

11.3.2 SOCIO-ECONOMIC STATUS:

The proposed Roughstone and gravel quarry is located in Sundakottai Village, Arupukottai Taluk, Virudhunagar District. The details of the 10Km radius study area has been provided below:

Table 11.4: Details of Buffer Zone

Village	Urban Area	Taluk	District
19	3	Arupukottai	Virudhunagar
45	-	Tiruchuli	
1	-	Kamuthi	Ramanathapuram
65	3	Total	



Table 11.5: Social, Economic And Demographic Profile of the Study Area

Details	Population	Percentage
A. Gender-wise distribution		
Male Population	102703	49.96
Female Population	102888	50.04
Total	205591	100
B. Caste-wise population distribution		
Scheduled Caste	18380	8.94
Scheduled Tribes	222	0.11
Other	186989	90.95
Total	205591	100
C. Literacy Levels		
Total Literate Population	157711	76.72
Others	47880	23.30
Total	205591	100
D. Occupational structure		
Main workers	87259	42.40
Marginal workers	10477	5.10
Total Workers	97736	47.50
Total Non-workers	107855	52.50
Total	205591	100

11.3.2.1 SAMPLE SURVEY:

Nearby villages were visited for conducting sample Village survey on all socio-economic aspects and requirements of the people. The existing socio-economic scenario is studied and CER activities are also suggested to the proponent. The study details are given in **Para 3.2.4, Chapter – III.**



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

11.3.3 EXISTING ENVIRONMENTAL QUALITY:

Table 11.6: Baseline Data

A) METEOROLOGICAL DATA		Winter Season (March 2023 to May 2023)		
PARAMETERS		MINIMUM	MAXIMUM	
Temperature in °C		21.0	40.3	
Humidity in %		20.8	95.2	
Wind speed Km/Hr		<1.8	29.9	
Predominant wind direction (From)		ENE		
B) AMBIENT AIR QUALITY		Monitoring Location – 5 locations		
PARAMETER		RESULT (µg/m ³)		*LIMIT (µg/m ³)
Location		Core Zone	Buffer Zone	
Particulate Matter (Size <10 µm)		40.2-58.6	39.1-69.6	100
Particulate Matter (Size <2.5 µm)		18.5-27.9	17.8-33.1	60
Sulphur Dioxide (as SO ₂)		4.5-6.8	4.2-7.2	80
Nitrogen Dioxide (as NO ₂)		6.9-10.1	6.4-11.2	80
<p>Conclusion: The existing Ambient Air Quality levels for PM10, PM2.5, SO2 and NO2, are within the NAAQ standards prescribed CPCB limits of 100 µg/m³, 60 µg/m³, 80 µg/m³ & 80 µg/m³. The CO values in all the locations were found to be below detectable limit. Silica values in the study area are found to be below detectable limit. (Detection limit – 0.05 mg/m³)</p>				
C) WATER QUALITY		Monitoring Location – 5 locations		*LIMIT (µg/m ³)
PARAMETER		Result		
pH at 25 °C		7.55 – 7.98		6.5-8.5
Total Dissolved Solids, mg/L		328 – 1018		2000
Chloride as Cl ⁻ , mg/L		68.90 – 455		1000
Total Hardness (as CaCO ₃), mg/L		202 – 385		600
Total Alkalinity (as CaCO ₃), mg/L		176– 305		600
Sulphates as SO ₄ ²⁻ , mg/L		24.60 – 220		400
Iron as Fe, mg/L		BDL(D.L 0.01) – 0.06		0.3
Nitrate as NO ₃ , mg/L		BDL(D.L 1.0) – 3.24		45
Fluoride as F, mg/L		0.11 – 0.35		1.5
<p>Conclusion: The water quality of ground water is found to be within the prescribed Permissible limits of IS: 10500 Norms in the absence of an alternative source as per Drinking Water Specifications.</p>				



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

D) NOISE LEVELS		Monitoring Location – 5 locations	
PARAMETER	RESULT dB(A)		*LIMIT (µg/m3)
	Day Equivalent	Night Equivalent	
Core Zone	51.9	39.4	90
Buffer Zone	44.9-49.8	37.4-41.7	Day Equivalent - 55dB(A), Night Equivalent - 45dB(A)
*Permissible noise for industrial workers as laid down by CPCB (at 8 hrs Exposure Time). While comparing with the MoEF&CC Norms, the monitored ambient noise levels are generally within the limit values.			
E) SOIL QUALITY		Monitoring Location – 3 locations	
PARAMETER	Range of values		
pH	6.98-7.46		
Electrical Conductivity (µmho/cm)	102.7 – 170.5		
Organic matter (%)	1.32 – 1.72		
Total Nitrogen (mg/kg)	590-748		
Phosphorus (mg/kg)	1.42 – 1.66		
Sodium (mg/kg)	215 – 256		
Potassium (mg/kg)	590 – 768		
Soil is of Silt Loam Type.			

F) LAND ENVIRONMENT:

For the present study on land use pattern in the study area, remote sensing satellite data have been used. The area estimated of land use categories around the 10km buffer zone is provided below:

Table 11.7: Land Use in 10Km Buffer Zone

S.No	Landuse Feature	Area (Sq.Km)	Percentage
1	Agriculture/ Plantation	41.73	13.25
2	Fallow Land	154.63	49.12
3	Land With Scrub	73.03	23.20
4	Land Without Scrub	27.77	8.82
5	Water bodies	5.81	1.85
6	Mining Area/ Industries	5.05	1.61
7	Settlement	4.32	1.37
8	Solar panel	2.47	0.79
	Total	314.81	100

From the above table it is seen that 72.32 % of the study area constitute fallow land and Land with scrub.



G) BIOLOGICAL ENVIRONMENT:

The lease area is a non-forest, private land. Major part of lease area is barren fallow land with bushes (*Prosopis juliflora*) and grasses. The detailed list of plants found in the core zone are given in Table no – 3.24. The Dominated species in the buffer zone are *Prosopis juliflora*, *Azadirachta indica*, *Borassus flabellifer*, *Acacia nilotica*, *Albizia lebbeck*, *Acacia leucophloea*, *Acacia auriculiformis*, etc. The detailed list of plants found in the Bufferzone is given in Table no – 3.25.

Fauna: There is no Wild Life Sanctuary or National Park within the study area of 10 km. Domesticated animals like Cows, Buffalos, Dogs, Cats etc., are commonly found. The lease and 10 Km buffer zone does not fall in the Western Ghats ESA boundary. No wild mammalian species was directly sighted during the field survey. There is no Schedule I species in the core & buffer zone. The list of fauna within the study area is given in Table No – 3.26.

H) HYDROLOGICAL STUDY:

The area applied for quarry lease is plain terrain with gentle slope towards south and covered by brownish soil followed by gravel formation and massive charnokite rock formation. Further elaborate details of the same has been provided under section 4.3.3C, Chapter-IV. The drainage map prepared from the survey of India topographic maps shows the presence of few streams running in a dendritic pattern. The general trend of depth to water level for Aruppukottai Taluk, Virudhunagar District, Tamil Nadu the was obtained from the data obtained from India-WRIS, Department of Water Resources, Ministry of Jal Shakti.

In the study area, wells and borewells were studied which indicate that shallow aquifer is developed through dug wells and deeper aquifer through tube wells. The groundwater has revealed that potential fractures are encountered at deeper levels. Rain water collected in the tanks in the region acts as a good source of water during post monsoon. The water in the wells are available mainly after post monsoon and it reduces during summer. The occurrence of groundwater mainly in the porous soil are weathered layers, very negligible amount of groundwater percolated through the poorly fractured layer, after that there is no existence of groundwater. Besides, the mining area consists of hard compact rock, no major water seepage within the mine is expected. From the nearby working mines, no such seepage is also observed.



11.4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES:

11.4.1 GENERAL:

This is a proposed project and Mechanized Open Cast mining will be carried out to quarry out Rough Stone & Gravel. The identified impacts due to this mine during mining and associated activities have been studied in relation to various environmental components like Air, water, noise, vibration, land, transport etc.

11.4.2 AIR ENVIRONMENT:

The principal sources of air pollution in the area due to mining and allied activities are dust generation in the mine due to various activities such as excavation of material, movement of HEMM, loading, unloading and transportation operations. Besides, Gas emission also occur as a result of emission of SO₂, NO_x, CO etc., from diesel driven mining equipment, compressors, generator sets, etc. The following measures will be adopted to control impact on the air quality due to mining operations in the lease area:

Table 11.8: Mitigation Measures – Air Environment

S.No	Activity	Mitigation Measures
1	Drilling	Usage of Drill bits in good condition
		Covering of drill holes with wet cloth
		Usage of sharp drill bits for drilling of holes.
		Provision of dust filters / mask to workers working at highly dust prone and affected areas.
2	Blasting	Well-designed blasting parameter, effective stemming to achieve optimum breakage occurs without generating fines.
		Use of appropriate explosives for blasting and avoiding overcharging of blast holes.
		Avoiding blasting during high wind periods where the fine dust is carried out away easily affecting the ambient air quality.
		Use of controlled blasting techniques with Nonel to keep the dust generation, noise as well as vibration level within the prescribed limits.
3	Excavation and Loading	Proper maintenance of HEMM
		Enclosures for operator cabin.
		Imparting sufficient training to operators on safety and environmental parameters.
		Proper maintenance of hauling equipments.

**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

		Avoiding overloading of dumpers.
4	Transportation	Regular wetting of transport road using mobile water tanker.
		Proper maintenance of haul road and other roads
		Setting up of tyre wash facility in the transport road.
		Avoiding overloading of tippers.
		Covering of loaded tippers with tarpaulins during transportation
		Vehicular emissions will be controlled through regular and proper preventive maintenance schedules and emissions tests are done with diesel smoke meter equipment to ensure emission values.
5	Others	Development of greenbelt / barriers around mine in the safety zone and carrying out plantation within the lease area.
		Green netting will be carried out around the lease periphery on all sides.

Due to adoption of all these measures, no major impact on air quality is envisaged due to this proposed opencast mining operation.

The impact on air quality due to the proposed project is estimated using AERMOD View Gaussian Plume Air Dispersion Model developed by Lakes Environmental Software which is based on steady state Gaussian plume dispersion. Ground Level Concentration (GLC) have been computed using hourly meteorological data for particulate matter PM10 and PM2.5.

The resultant added concentrations with baseline figures even at worst scenario, show that the values of ambient air quality with respect to PM₁₀ are in the range of 50.1 µg/m³ to 70.6 µg/m³ and with respect to PM_{2.5} are in the range of 23.7 µg/m³ to 34.1 µg/m³ which are within the statutory limits in each case.

For preservation of environment in this mine strict enforcement of management schemes will be undertaken for taking corrective actions, as needed. By adopting the effective implementation of all the mitigative measures, no adverse impact on Air quality due to the mining operation in this lease area is expected.

11.4.3 WATER ENVIRONMENT:

Water Requirement: The total water requirement for this project will be 10.0 KLD comprising 1.0 KLD for drinking water and domestic use, 8.0 KLD for dust suppression and 1.0 KLD for greenbelt.



DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE, ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.

The water will be sourced initially from outside agencies. Later the rainwater collected in the mine pit sump will be used for this purpose.

The activity / source of pollution, its impact / consequence, proposed control measures are explained below:

Table 11.9: Mitigation Measures – Water Pollution

S.No	Source	Consequence	Mitigation Measures
A	Domestic use	Generation of waste water	The domestic sewage to be generated from the project will be collected in septic tank with soak pits.
B	Rainfall	Runoff from waste dump and stack	Towards surface runoff management, a garland drain of length 450m will be constructed around the quarry and will be connected to a settling pond with silt traps. The supernatant clear water from the settling pond will be flow to the downstream users.
		Rainwater Harvesting	The rain water falling in the quarry will be harvested in the sump at the lowest level of the quarry. This sump will act as a settling pond to prevent solids escaping along with discharge, before outlet etc.
C	Drainage Course	Disturbance to drainage course	There is a seasonal drainage channel located on the southern side of the lease for which 10m safety distance has been left. Earthen bund will be formed within the lease area. There is no proposal to discharge any effluent into this waterbody. No major impact is envisaged on the nearby water bodies due to project operations

- Stage of Groundwater Development:** The groundwater resource data of Virudhunagar district was obtained from the data provided in the technical report of the Central Ground Water Board, South Eastern Costal Region – 'District groundwater brochure, Virudhunagar District.' Based on the report it is seen that this area can be categorized as 'Safe' from ground water development point of view.
- Generation of mine pit water:** The occurrence and movement of groundwater in hard rock formations are restricted to the porous zones of weathered formations and the open systems of fractures, fissures and joints. Generally, in hard rock regions, occurrence of weathered thickness is discontinuous both in space and depth. Hence recharge of groundwater in hard rock formations is influenced by the intensity and depth of weathering. In the nearby region, the formations are compact with less intergranular porosity and fractures leading to less permeability and transmissivity values and as such the ground



water level in this area is deep from surface. The mining area consists of hard compact rock, hence no major water seepage within the mine is expected from the periphery. The ultimate pit depth of mining is 41m. The ground water table in this area is below this level. Hence, ground water intersection is not envisaged and ground water will not be affected appreciably due to the quarrying operation.

11.4.4 NOISE ENVIRONMENT:

Anticipated noise levels resulting from operation of the various machines like excavator, tippers, drill have been computed using point source model. Computation of cumulative noise levels at the nearby villages is made based on the assumption that there are no attenuation paths between the source and the boundary. From the studies, it is found that the predicted Noise Levels due to mining operations at the periphery of the mine lease itself will be less even without considering any attenuation factor. However, practically there will be attenuation due to vegetation etc., and as such there will not be any adverse noise propagation outside the lease boundary. Since the habitations are also away the effect of noise due to mining operations will not be felt at all in the surrounding village. Hence, by implementing the following mitigative measures for noise control, the impact on noise levels will continue to be insignificant.

- Planting rows of native trees along roads, around mine area and other noise generating centres to act as acoustic barriers.
- Sound proof operator's cabin for equipments like shovel, tippers, etc.
- Proper and regular maintenance of equipments may lead to less noise generation.
- Providing in-built mechanism for reducing sound emissions.
- Providing earplugs 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.
- Provision of green net in lease periphery



DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE, ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.

Further green belt and afforestation will be planned and executed to abate noise and dust propagation in the area.

11.4.5. VIBRATION:

To reduce ground vibratory conditions, various control measures will be implemented such as keeping PPV below 10mm/s for 8-25hz frequency range, formulating drilling and charging pattern with less explosive charge, initiating sequence and using NONEL, carrying out blasting with minimum charge per delay, avoiding blasting during strong winds etc. By adoption of above measures, it will be ensured that the ground level vibration due to blasting are maintained within the limits prescribed by DGMS, Dhanbad at the mining areas vide Circular No. 7 dated 29 -08-1997. Besides, different blasting time for the projects in the vicinity is suggested and the timing is to be mentioned in the display board in the respective mines entrance. Elaborate details regarding the same are provided under section 4.4.2, Chapter-IV.

11.4.6 IMPACT ON LAND ENVIRONMENT:

The lease area of 1.50.0 Ha in S.F.No.44/1(P), 44/5(P), 44/6, 44/7, 44/8 is a patta land in the name of the applicant vide Patta No. 577 (Annexure-V of Mining Plan). There is no waste generation anticipated in this quarry operation since the entire excavated material will be utilized. Hence, there is no external overburden dump involved. Plantation will be carried out in this safety zone area. In the post mining stage, an area of 0.865 Ha of mined out area will be left as water body. 0.01Ha will be infrastructure, 0.02 Ha will be roads and 0.605 Ha will be covered with vegetation. Entire mined out area will be properly fenced to prevent inadvertent entry of men and animals. In the post mining stage the rainwater harvested in the mined out void shall be utilized.

11.4.7 BIOLOGICAL ENVIRONMENT:

Necessary mitigative measures like dust suppression, proper maintenance of equipment's, greenbelt and plantation etc., will be carried out to prevent dust generation & any further impact on the vegetation. In the lease area, safety barrier 7.5m around the periphery is left. About 750 trees will be planted in and around the lease area.



11.4.8 SOCIO ECONOMIC ENVIRONMENT:

The entire lease area is a private patta land. Hence, there are no habitations or hutments in the core zone area and no rehabilitation or resettlement problems will arise here. The mining operations in the proposed quarry will employ about 20 people. Besides through allied opportunities in logistics, trading, repairing works etc. good employment potential will arise in this area, which will provide raising income levels and standards of living in the area through various service related activities connected with the project operations.

Towards the socio economic development of the surrounding area, the proponent has earmarked an amount of Rs.5.0 Lakhs under Corporate Environmental Responsibility. The activities identified under CER will be implemented in a phased manner. In consultation with the locals based on the need & priority it will be implemented.

11.4.9 OCCUPATIONAL HEALTH AND SAFETY ASPECTS:

In order to ensure minimisation of occupational health and safety problems in the project operation, the following preventive remedial measures will be effectively exercised in the project operations, so as to comply with applicable standards.

- Medical examination of workers 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.
- Regular awareness campaigns amongst staff and workers
- Staff will be provided with PPE to guard against excess noise levels, Dust generation and inhalation, etc., as per standards prescribed by DGMS.

11.4.10 IMPACT ON LOCAL LOGISTICAL SYSTEM DUE TO PROJECT:

From this proposed quarry the entire output will be transported to the consumers like external crusher units for producing stone aggregates of different sizes or construction of roads, bridges, buildings and other buyers etc. There will be about 3 trips per hour. The transport route can easily absorb this negligible traffic due to this project. The following mitigative measures are suggested for mitigation of adverse impacts on the logistical aspect of the project:

- ❖ Water sprinkling on Rough stone in the transport vehicles before transporting, so that no dust nuisance during transport will arise.



- ❖ Proper maintenance of transport roads
- ❖ Proper maintenance of transport vehicles
- ❖ Avoiding overloading of material
- ❖ Covering of loaded vehicles with tarpaulins sheet if warranted.

11.4.11 WASTE MANAGEMENT:

Since the entire mined out material will be used there will not be any solid waste generation from this project. There is no process effluent generation from this mine. Hence no liquid waste is generated.

The hazardous waste generated in this mine will be stored in a separate storage area with impervious containers for waste oil, oil contaminated clothes, used lead acid batteries, scraps, tyre storage etc. It will be disposed through authorized recyclers or re-processors periodically. The hazardous wastes will be transported in accordance with the provisions of rules. By effective implementation of above said mitigation measures no major impact due to Hazardous waste is expected.

Single use plastics/ use and throwaway plastics will be banned in the site as directed by the Tamil Nadu Government vide GO(Ms)No.84 regarding ban on use of plastic products. The employees will be encouraged to use compostable material or reusable material.

11.5 ENVIRONMENTAL MONITORING PROGRAMME:

The monitoring schedules are planned for systematic study of various pollution levels with respect to air and water qualities, noise levels, etc. to ensure that they conform to the standards laid down by Environmental Protection Act and various statutory Limits.

Monitoring 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.

Towards EMP measures, Rs.17.00 Lakhs is allocated under capital cost. Besides, Rs.14.78 Lakhs per annum will be spent under recurring cost. All the recurring cost of maintenance of pollution control measures, environmental monitoring etc., will be met from revenue. Further



details of the capital and recurring cost of environmental management has been provided in in Table No. 10.2, Chapter-X.

11.6 ADDITIONAL STUDIES:

This draft EIA/EMP report will be exposed to public consultation as per mandatory procedures through the District Collector and State Pollution Control Board officials after giving 30 days advance notice in two local newspapers about the scheduled date and time for conduct of the public hearing procedures. The opinions, concerns and objections of stakeholders will be recorded during the public hearing. All the public queries and the replies to the query by the project proponent and officials concerned will be recorded and incorporated in the EIA/EMP report for approval by SEIAA, Tamil Nadu. Elaborate description in respect of Risk Assessment and Mine closure plan are given in **Chapter - VII**.

Although the individual lease area of this project is less than 5 Ha, the other existing and proposed quarries within the 500m radius along with this subject project works out to >5 Ha. The baseline monitoring carried out for this project reflects the cumulative impact of the existing quarry. For proposed quarries, the cumulative impact of these proposed quarry operations on the environment is studied.

Air : The cumulative impact on ambient air quality for PM₁₀ and PM_{2.5} due to the operations of these proposed projects are predicted based on Air Quality Model simulations. It can be seen that the resultant added concentrations with baseline figures even at worst scenario and cumulative impact of the projects show that the values of ambient air quality with respect to PM₁₀ are in the range of 51.1 µg/m³ to 70.6 µg/m³ and with respect to PM_{2.5} are in the range of 23.7 µg/m³ to 36.1 µg/m³ which are within the statutory stipulations in respective case.

Water : The quantum of water required for these projects total to 40 KLD comprising 10KLD each for the proposed 4 quarries. Though it may be sourced from outside agencies initially, for these projects it is planned to use the rain water collected in the mine sump later.

The mining area consists of hard compact rock, hence no major water seepage within the mine is expected from the periphery. From the nearby working quarries it is observed there are no seepages in the mine faces because of the hard rock formation. The static ground water table in



DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE, ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.

this area is also very deep. Hence, ground water intersection is not envisaged and ground water will not be affected appreciably due to the quarrying operation.

Besides, the stage of groundwater development of Aruppukottai Taluk where the study area falls under safe category as per the groundwater resource data obtained from technical report of the Central Ground Water Board, South Eastern Coastal Region – 'District groundwater brochure, Virudhunagar District.' Thus there is scope for further ground water development.

Noise : Cumulative post project noise levels in the nearby 4 villages are within the statutory limits of 55dB(A). Besides it is proposed to carry out various mitigative measures such as carrying out greenbelt and afforestation to act as acoustic barriers.

Vibration : By Carrying out controlled blasting using Nonel, Optimum design for burden and spacing & reducing the explosive charge per delay to minimum in all the three projects no adverse impact due to blasting vibration is expected. Besides, different blasting time for the projects is suggested and the timing is to be mentioned in the display board in the mines entrance. Blasting through qualified blaster will be carried out.

Traffic : The mined out minerals will be transported by means of trucks to the consumers like crusher units for producing stone aggregates of different sizes or construction of roads, bridges, buildings and other buyers etc. The total trips from these projects there will be about 15 trips per hour. The existing road can absorb this traffic due to this project. Various measures like proper maintenance of road, covering of the loaded truck with tarpaulin, water sprinkling will be carried out to ensure no adverse impact on the logistical front.

Socio-Economy: Towards socio economic development of the surrounding area, under Corporate Environmental Responsibility Rs 5 lakhs has been earmarked separately for all the 4 projects.

Land use : For all the three projects, in the post mining stage it will be ensured that the entire mined out area will be properly fenced to prevent inadvertent entry of men and animals. The rainwater harvested in the mined out void shall be utilized to meet the water requirement.



11.7 CONCLUSION:

By systematic and scientific mining adhering to all the statutory norms and enforcing and strictly implementing the above said mitigation measures mentioned in this report, no adverse impact is envisaged. The proposed mining project will benefit 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, etc. in its own way and also revenue to Government through royalty, taxes etc. Besides, it will meet the raw material requirement of the construction industry also.



CHAPTER - XII

DISCLOSURE OF CONSULTANTS ENGAGED

CHAPTER 12

DISCLOSURE OF CONSULTANTS ENGAGED

Creative Engineers & Consultants, Chennai is an **NABL** accredited testing laboratory and **NABET** accredited EIA consultancy. Established over 25 years ago, this company has steadily made good strides in the environmental impact assessment fields, and is also one of the first companies to get accredited by NABET as an Accredited Consultant Organization as early as 2011. Creative Engineers & Consultants has to its credit, successful completion of numerous EIA/EMP reports, grant of environmental clearances and periodic environmental monitoring works. Presently, the company has been accredited by NABET as a 'Category-A' organization for the sectors of Mining of Minerals (opencast only), Thermal Power Plants, Mineral Beneficiation and Cement Plants with the accreditation valid upto 23.12.2023. The team of experienced professionals that are a part of this organization has been detailed below.

Figure 12.1: Disclosure of consultants engaged

EXPERT NAME	QUALIFICATION	POSITION	EXPERIENCE
Mr. P. Giri	AMIE (Mining)	EIA Coordinator & Functional area Expert (AP,NV,HW),	Over 30 years of experience in EIA/EMP report, mine plan preparation, including modeling
Mr. K. Shankar	M.Sc (Geology), PGMEMG	Functional area Expert (GEO, HG, SHW, RH) & IBM approved RQP.	Over 25 years of experience in EIA/EMP report, Mine plan, hydrological report preparation
Dr. N. Radhakrishnan	M.Sc., M.Tech., Ph.D	Functional area Expert (Land use)	Over 25 years of experience in using the advanced spatial analysis techniques in GIS environment. Specialized in Spatial Information Technology and Applications (remote sensing, GIS)
Mr.S.S.Rajendran	M.Sc. (Pharmaceutical Chemistry)	Lab head	More than 9 years of experience in Environmental laboratory.



**DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF
TMT.R.CHEMPAKADEVI OVER AN AREA OF 1.50.0Ha IN SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.**

EXPERT NAME	QUALIFICATION	POSITION	EXPERIENCE
Mr. R. Babu raj	M.A (Sociology), B.Com(Y.L&Cost), ITI, Advance Diploma in Computer application	Functional Area Expert (Socio Economy)	Over 13 years of experience in dispersion modeling, computer applications. Specialized in CAD and computer software, applications. 5years experience in the field of socio economy and its allied report preparation.
Mr. B. Govindaraman	B.Sc.	Field technician	Over 20 years of field monitoring & data collection experience
Dr.B.Swamynathan	M.Sc (Ecology & Environmental Sciences), M.Phill (Botany), Ph.D (Ecology & Environmental Sciences)	EIA Coordinator & Functional Area Expert (EB,SC,LU&AP)	More than 12 years of experience in Environment and allied fields.
Ms. G. Sandhya	B. Tech Chemical Engineering M.Tech Environmental Engineering	EIA Coordinator & Functional Area Expert (AQ&WP)	Over 5 years experience in preparation of EIA/EMP reports



ANNEXURES

39

புவியியல் மற்றும் சுரங்கத்துறை

ந.க.எண்: கேவி1/878/2018-கனிமம்,

உதவி இயக்குநர் அலுவலகம்,
மாவட்ட ஆட்சியர் அலுவலக வளாகம்,
விருதுநகர்.

நாள்: 26.08.2022.



குறிப்பாணை

பொருள்: கனிமங்களும் குவாரிகளும் - விருதுநகர் மாவட்டம் - அருப்புக்கோட்டை வட்டம் - சுண்டக்கோட்டை கிராமம் - பட்டா புல எண்கள்: 44/1 (P) (0.43.50), 44/5(P) (0.34.5), 44/6 (0.14.5), 44/7 (0.14.5) & 44/8 (0.43.0) மொத்தம் 1.50.00 ஹெக்டேர் - ஐந்து வருடங்களுக்கு உடைகல் மற்றும் கிராவல் குவாரி உரிமம் வழங்கல் - சரியான பரப்பு (Precise Area) தேர்வு செய்யப்பட்டது - சுரங்கத்திட்டம் மற்றும் மாநில அளவிலான சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் இசைவினைப் பெற்று சமர்ப்பிக்க கோருவது - தொடர்பாக.

- பார்வை:**
1. திருமதி.R.செண்பகாதேவி, க/பெ.T.R.வாதராஜன், வடுகர் கோட்டை, அருப்புக்கோட்டை வட்டம், விருதுநகர், விண்ணப்பம் நாள்: 19.11.2018, 16.05.2019 மற்றும் 22.08.2022.
 2. இவ்வலுவலக கடிதம் எண் ந.க.கேவி1/878/2018, நாள்: 19.11.2018
 3. அருப்புக்கோட்டை, வருவாய் கோட்டாட்சியர் கடித எண் ந.க.அ2/7694/2018, நாள்: 06.05.2019.
 4. உதவி இயக்குநர், புவியியல் மற்றும் சுரங்கத்துறை அவர்களின் புலத்தணிக்கை அறிக்கை நாள்: 23.08.2022
 5. 1959 -ம் வருடத்திய தமிழ்நாடு சிறுகனிம சலுகை விதிகள் 41 மற்றும் 42.
 6. அரசாணை எண்.169 தொழில் (எம்.எம்.சி.1) துறை, நாள்: 04.08.2020.
 7. அரசாணை எண்.208, தொழில் (எம்.எம்.சி.1) துறை, நாள்: 21.09.2020.
 8. தொடர்புடைய ஆவணங்கள்.

விருதுநகர் மாவட்டம், அருப்புக்கோட்டை வட்டம், சுண்டக்கோட்டை கிராமம், பட்டா புல எண்கள்: 44/1 (0.82.0), 44/5 (0.39.5), 44/6 (0.14.5), 44/7 (0.14.5) & 44/8 (0.43.0) மொத்தம் 1.93.50 ஹெக்டேர் பரப்பில் 5 வருடங்களுக்கு உடைகல் மற்றும் கிராவல் குவாரி குத்தகை உரிமம் வழங்கக்கோரி விருதுநகர் மாவட்டம்,

RC 32/65 @ K. Cheepakka Jay

அருப்புக்கோட்டை வட்டம், வடுகர் கோட்டை, கதவு எண்.1 என்ற முகவரியில் வசித்து வரும் திருமதி.R.செண்பகாதேவி, க/பெ.T.R.வரதராஜன் என்பவர் பார்வை 1-ல் காணும் விண்ணப்பத்தினை சமர்ப்பித்துள்ளார்.

அருப்புக்கோட்டை, வருவாய் கோட்டாட்சியர் மற்றும் புலியியல் மற்றும் சுரங்கத்துறை, உதவி இயக்குநர் ஆகியோர் கீழ்க்காணும் நிபந்தனைகளுக்குட்பட்டு மேற்கண்ட புலங்களில் உடைகல் மற்றும் கிராவல் குவாரி குத்தகை உரிமம் ஐந்தாண்டுகளுக்கு வழங்க பரிந்துரை செய்துள்ளனர்.

- 1) அருகிலுள்ள பட்டா நிலங்களுக்கு 7.5 மீ பாதுகாப்பு இடைவெளி விடுத்து குவாரி செய்தல் வேண்டும்.
- 2) புலத்தின் தெற்கில் புல எண் 43-ல் செல்லும் ஓடை மற்றும் புறம்போக்கு நிலங்களுக்கு 10 மீட்டர் பாதுகாப்பு இடைவெளி விடுத்து குவாரி செய்தல் வேண்டும்.
- 3) பொதுமக்கள் / விவசாய நிலங்களுக்கு பாதிப்பு ஏற்படாத வகையில் தகுதி வாய்ந்த அங்கீகரிக்கப்பட்ட நபர்கள் மூலம் வெடிமருந்துகள் சேமிக்கப்பட்டு குவாரியில் வெடித்தல் வேண்டும். குவாரியில் குறைந்த சக்தி கொண்ட வெடி மருந்துகளை பயன்படுத்தல் வேண்டும்.
- 4) சுரங்கத்திட்டம் மற்றும் சுற்றுச்சூழல் தடையில்லாச் சான்று குத்தகை உரிமம் வழங்குவதற்கு முன் சமர்ப்பிக்க வேண்டும்.
- 5) குவாரியில் வேலை செய்யும் தொழிலாளர்கள் தொழிலாளர் நலவாரியம் மற்றும் காப்பீடு திட்டத்தில் பதிவு செய்து தொழிலாளர் நலன் பேண்பட வேண்டும்.
- 6) குழந்தை தொழிலாளர்களை குவாரி பணியில் அமர்த்தக் கூடாது.
- 7) கனிமங்களை வாகனங்களில் கொண்டு செல்லும் போது பாதுகாபிகள், பொது மக்கள் மற்றும் பிற வாகனங்கள் பாதிக்காதவண்ணம் தார்பாய்கள் கொண்டு மூடி எடுத்துச் செல்ல வேண்டும்.

எனவே, துறை அலுவலர்களின் பரிந்துரையினை ஏற்றும் நிபந்தனைகளுக்கு உட்பட்டும், விருதுநகர் மாவட்டம், அருப்புக்கோட்டை வட்டம், சுண்டக்கோட்டை கிராமம், பட்டா புல எண்கள்: 44/1 (P) (0.43.50), 44/5(P) (0.34.5), 44/6 (0.14.5), 44/7 (0.14.5) & 44/8 (0.43.0) மொத்தம் 1.50.00 ஹெக்டேர் நிலம் 1959 -ம் வருடத்திய தமிழ்நாடு சிறுகனிம சலுகை விதிகள் விதி எண்: 19 (1) மற்றும் 20 -ன் படி ஐந்து வருடகாலத்திற்கு உடைகல் மற்றும் கிராவல் குவாரி உரிமம் வழங்க தகுதி வாய்ந்த நிலப்பரப்பாக (Precise Area) கருதப்படுகிறது.

RC 33/5 

34



தமிழ்நாடு சிறுசுருகை சலுகை விதிகள்-1959 விதி எண்: 41 -ன்படி குவாரி பணி மேற்கொள்வது தொடர்பாக வரையு சுரங்கத் திட்டத்தினை (Mining Plan) 90 தினங்களுக்குள் சமர்ப்பிக்குமாறும், விதி எண்:42-ன்படி மாநில அளவிலான சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் (State Level Environmental Impact Assessment Authority) இசைவினைப் பெற்று சமர்ப்பிக்குமாறும் மனுதாரர் திருமதி.R.செண்பகாதேவி கேட்டுக் கொள்ளப்படுகிறார்.

[Handwritten Signature]
உதவி இயக்குநர்,
புவியியல் மற்றும் சுரங்கத்துறை,
விருதுநகர்

பெறுநர்
திருமதி.R.செண்பகாதேவி,
க/பெ.T.R.வரதராஜன்,
கதவு எண்.1,
வடுகர் கோட்டை,
அருப்புக்கோட்டை வட்டம்,
விருதுநகர் மாவட்டம்.

[Handwritten Stamp]
26/11/2022

நகல்
உறுப்பினர் செயலர்,
மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையம் (SEIAA),
சென்னை.

⊗ *[Handwritten Signature]* V. Cheyapala

RC 31/68

From
Thiru.T.Selvasekar, M.Sc.,
Assistant Director,
Geology and Mining,
Virudhunagar.

To
Tmt.R.Chempaka Devi,
W/o.T.R.Varadarajan,
No.1, Ramasamy Naicker Street,
Vadugarkottai,
Aruppukottai Taluk,
Virudhunagar.

76

Roc.No:KV1/878/2018, Dated:22.11.2022.


Sir,

Sub: Mines and Minerals - Minor Mineral - Virudhunagar District - Aruppukottai Taluk - Sundakottai Village - Patta Land - S.F.Nos:44/1 (P) (0.43.50), 44/5(P) (0.34.5), 44/6 (0.14.5), 44/7 (0.14.5) & 44/8 (0.43.0) - Extent 1.50.00 Hectares - Quarry lease application preferred by Tmt.R.Chempaka Devi for quarrying Rough Stone and Gravel - Approval of Mining Plan - Regarding.

- Ref:**
1. Quarry lease application received from Tmt.R.Chempaka Devi dated:19.11.2018.
 2. Representation received from Tmt.R.Chempaka Devi dated: 16.05.2019 & 22.08.2022.
 3. The Assistant Director, Geology and Mining, Virudhunagar Rc.No.KV1/878/2018, Dated: 26.08.2022.
 4. Tmt.R.Chempaka Devi, letter dated: 21.11.2022.

Tmt.R.Chempaka Devi has preferred an application for the grant of quarrying lease to quarry Rough Stone and Gravel over an extent of 1.50.00 Hectares of Patta Land in S.F.Nos:44/1 (P) (0.43.50), 44/5(P) (0.34.5), 44/6 (0.14.5), 44/7 (0.14.5) & 44/8 (0.43.0) of Sundakottai Village, Aruppukottai Taluk, Virudhunagar District for a period of 5 Years Under Rule 19 of Tamil Nadu Minor Mineral Concession Rules 1959.

2) The application was examined and consented to grant lease to quarrying Rough Stone and Gravel over an extent of 1.50.00 Hectares of Patta Land in S.F.Nos:44/1 (P) (0.43.50), 44/5(P) (0.34.5), 44/6 (0.14.5), 44/7 (0.14.5) & 44/8 (0.43.0) for a period of 5 years subject to produce Mining Plan for approval and to obtain Environment Clearance from SEIAA in the reference 2nd cited.

P.C. 30/10/22  Chempaka Devi

3) The applicant has submitted Mining Plan, prepared as per guidelines issued by the Commissioner of Geology and Mining and as per Rules and Acts. The Geological and Mineable reserves are discussed in Part - A 3. The applicant can quarry the mineral in the following measurements:-

Geological Resources (As per Mining Plan)

SECTION	LENGTH (M)	WIDTH (M)	HEIGHT (M)	ROUGH STONE VOLUME M ³	TOP SOIL & GRAVEL VOLUME M ³
A-A' & B-B'	133	120	6.0	-	95,760
	133	120	35.0	5,58,600	-
TOTAL GEOLOGICAL RESERVES				5,58,600	95,760

Mineable Reserves (As per Mining Plan)

SECTION	LENGTH (M)	WIDTH (M)	HEIGHT (M)	ROUGH STONE VOLUME (M ³)	TOP SOIL & GRAVEL VOLUME (M ³)
A-A' & B-B'	116	100	6.0	-	69,600
	101	85	5.0	42,925	-
	91	75	5.0	34,125	-
	81	65	5.0	26,325	-
	71	55	5.0	19,525	-
	61	45	5.0	13,725	-
	51	35	5.0	8,925	-
	41	25	5.0	8,125	-
TOTAL MINEABLE RESERVES				1,50,675	69,600

Year wise -Production Schedule (As per Mining Plan)

SECTION	YEAR	LENGTH (M)	WIDTH (M)	HEIGHT (M)	ROUGH STONE VOLUME (M ³)	GRAVEL VOLUME (M ³)
A-A' & B-B'	I-Year	51	100	6.0	-	30,600
		36	85	5.0	15,300	-
		26	75	5.0	9,750	-
		16	65	5.0	5,200	-
I - YEAR PRODUCTION					30,250	30,600
A-A' & B-B'	II- Year	17	100	6.0	-	10,200
		17	85	5.0	7,225	-
		17	75	5.0	6,375	-
		17	65	5.0	5,525	-
		23	55	5.0	6,325	-
13	45	5.0	2,925	-		
II - YEAR PRODUCTION⁴⁻⁵					28,375	10,200

REC 81/104 (D) R Chempaka (S)

A-A' & B-B'	III- Year	16	100	6.0	-	9,600
		16	85	5.0	6,800	-
		16	75	5.0	6,000	-
		16	65	5.0	5,200	-
		16	55	5.0	4,400	-
		16	45	5.0	3,600	-
		19	35	5.0	3,325	-
		9	25	5.0	1,125	-
III - YEAR PRODUCTION					30,450	9,600
A-A' & B-B'	IV- YEAR	16	100	6.0	-	9,600
		16	85	5.0	6,800	-
		16	75	5.0	6,000	-
		16	65	5.0	5,200	-
		16	55	5.0	4,400	-
		16	45	5.0	3,600	-
		16	35	5.0	2,800	-
		16	25	5.0	2,000	-
IV - YEAR PRODUCTION					30,800	9,600
A-A' & B-B'	V- YEAR	16	100	6.0	-	9,600
		16	85	5.0	6,800	-
		16	75	5.0	6,000	-
		16	65	5.0	5,200	-
		16	55	5.0	4,400	-
		16	45	5.0	3,600	-
		16	35	5.0	2,800	-
		16	25	5.0	2,000	-
V - YEAR PRODUCTION					30,800	9,600
TOTAL PRODUCTION FOR FIVE YEARS					1,50,675	69,600

The available mineable reserves have been computed as 1,50,675 m³ as Rough Stone, 69,600 m³ as Gravel up to the depth of 41.0m from the ground level.

The Environmental Management Plan and Mine closure plan are discussed Part - B 9 & 10 and all conditions has been incorporated in the Mining Plan as laid down by the authorities.


4) In view of the above, in exercise of the powers delegated under Rule 41 of Tamil Nadu Minor Mineral Concession Rules, 1959, I hereby approve the Mining Plan submitted by Tmt.R.Chempaka Devi for quarrying Rough Stone and Gravel over an extent of 1.50.00 Hectares of Patta Land in S.F.Nos:44/1 (P) (0.43.50), 44/5(P) (0.34.5), 44/6 (0.14.5), 44/7 (0.14.5) & 44/8 (0.43.0) of Sundakottai Village, Aruppukottai Taluk, Virudhunagar District for a period of 5 years to obtain Environment Clearance from SEIAA, Chennai subject to the following conditions:

RC 82/104 ⊕ K. Chempaka Devi

79


1. The Mining Plan is approved without prejudice to any other law applicable to the quarry permission from time to time where such Laws are made by the State Government or any other authority.
2. This approval of the Mining Plan does not in any way imply the approval of the Government in terms of any other provisions of the Tamil Nadu Minor Mineral Concession Rules, 1959.
3. The Mining Plan is approved without prejudice to any other order or direction from any court of competent jurisdiction.
4. The approval of the Mining Plan does not in any way imply the approval of the Government in terms of any other provisions of the Mines and Minerals (Development and Regulation) Amendment Act, 2015 or any other connected Laws including, Environment Protection Act, 1986, and the Rules made there under in Tamil Nadu Minor Mineral Concession Rules, 1959.

Encl: Two copies of Mining Plan.


Assistant Director,
Geology and Mining,
Virudhunagar.

Copy to:
The Member Secretary,
State Level Environmental Impact
Assessment Authority,
PanagalMaligai,
No. I Jeenis Road,
Saidapet, Chennai-15.


24/11/2014

RC 83/104 

80

From
Thiru.T.Selvasekar, M.Sc.,
Assistant Director,
Geology and Mining,
Virudhunagar.

To
Tmt.R.Chempaka Devi,
W/o.T.R.Varadarajan,
No.1, Ramasamy Naicker Street,
Vadugarkottai,
Aruppukottai Taluk,
Virudhunagar.

Roc.No:KV1/878/2018, Dated:22.11.2022.

Sir,

Sub: Mines and Minerals - Minor Mineral - Virudhunagar District - Aruppukottai Taluk - Sundakottai Village - Patta Land - S.F.Nos:44/1 (P) (0.43.50), 44/5(P) (0.34.5), 44/6 (0.14.5), 44/7 (0.14.5) & 44/8 (0.43.0) - Extent 1.50.00 Hectares - Quarry lease application preferred by Tmt.R.Chempaka Devi for quarrying Rough Stone and Gravel - Details of quarries in 500 meter radius - Regarding.

- Ref:**
1. Quarry lease application received from Tmt.R.Chempaka Devi dated:19.11.2018.
 2. Representation received from Tmt.R.Chempaka Devi dated: 16.05.2019 & 22.08.2022.
 3. The Assistant Director, Geology and Mining, Virudhunagar Rc.No.KV1/878/2018, Dated: 26.08.2022.
 4. Tmt.R.Chempaka Devi, letter dated: 21.11.2022.

Tmt.R.Chempaka Devi has preferred an application for the grant of quarrying lease to quarry Rough Stone and Gravel over an extent of 1.50.00 Hectares of Patta Land in S.F.Nos:44/1 (P) (0.43.50), 44/5(P) (0.34.5), 44/6 (0.14.5), 44/7 (0.14.5) & 44/8 (0.43.0) of Sundakottai Village, Aruppukottai Taluk, Virudhunagar District for a period of 5 (Five) Years Under Rule 19 of Tamil Nadu Minor Mineral Concession Rules 1959.

The applicant Tmt.R.Chempaka Devi in the reference 3rd cited has requested to furnish details of quarries situated within 500 m radial distance from the applied area.

⊕ Ch. Chempaka Devi

RC 24/10/21

81

As per his request the details of quarry situated within 500 meter radius from the proposed area for Environmental Clearance as detailed below:

1) Details of quarry within 500 m radius from the applied area

S. No	Quarry detail	Village	S.F. No.& Extent (Hects)	Proceedings No. & Lease Period
I	Existing Quarries:			
1.	Thiru. T.R. Varatharajan, No: 54, Great Cotton Road, Aruppukottai, Aruppukottai Taluk Virudhunagar District.	Sundakottai	53/4, 53/5A (1.40.5)	KV1/11431/2016 Dated: 05.01.2017 18.01.2018 to 17.01.2023
2.	Thiru.T.R.Varadha rajan I, Ramasamy Nayakkar Street, Aruppukottai	Sundakottai	48/12, 48/13, 48/14, 50/2 etc., (2.22.5)	KV1/737/2018 Dated:12.05.2022 17.05.2022 to16.05.2027
II	Abandoned Quarry:			
1.	Thiru. M. Jesumuthu, S/o. Mariyaraj, D.No. 1/99, Aladipatti Village Post, Aruppukottai Taluk, Virudhunagar District.	Sundakottai	52/3, 52/5 (1.25.00)	KV1/28706/ 2014 Dated:03.03.2016 14-06-2016 to13-06-2019
2.	Thiru.B.Bose @ Thavasiyana Thevar, S/o.Pandi Thevar, Semponnerunchi Village, Thiruchuli Taluk, Virudhunagar.	Sundakottai	3/4B, 3/5B etc., (2.31.50)	KV1/1310/2009 Dated:26.10.2009 29.12.2009 to 28.12.2014
3.	Thiru.T.R.V.RamKumar, S/o.T.R. Varadharajan Door No. 54, Great Cotton Road, Aruppukottai Taluk, Virudhunagar District.	Konkanang kuruchi	113/1, 113/2 etc., (1.17.00)	KV1/74/2012 Dated:11-07-2014 11.09. 2014 to 10.09. 2019
III	Present Proposed Quarry :			
1.	Tmt.R.Chempaka Devi, W/o.T.R.Varadarajan, No.1, Ramasamy Naicker Street, Vadugarkottai, Aruppukottai Taluk, Virudhunagar,	Sundakottai	44/1 (P), 44/5(P), 44/6, 44/7 & 44/8 (1.50.00)	KV1/878/2018, Dated: 26.08.2022.
2.	Thiru.M.Thiruvappu S/o.Muniasamy Devarkurutchi Village Kadaladi Taluk Ramanathapuram District	Sundakottai	64/3A,64/3B 64/3D, 65/2A 65/2B,65/3A etc., (3.40.50)	KV1/666/2020 Dated: 24.11.2020

84

22/05/2024 A-9

Chempaka Devi

3.	Thiru.K.Bharathiraja S/o.Krishnan 7-8M-33, Ajeesh Nagar Aruppukottai Post. & Taluk	Sundakottai	112/6A, 112/7A (2.41.0)	KV1/531/2020 Dated:28.09.2020
4.	Thiru.S.K.Subbarettiar 99, Keelakaranthai Kamatchi Chettiar Street, Sourth Street, Aruppukottai Taluk	Sundakottai	46/1, 46/2 46/3, 46/4 (1.29.5)	KV1/245/2020 Dated:07.10.2020

[Signature]
Assistant Director, 22/11/2022
Geology and Mining,
Virudhunagar.

Copy to:

The Member Secretary,
State Level Environmental Impact
Assessment Authority,
PanagalMaligai,
No. 1 Jeenis Road,
Saidapet,
Chennai-15.

[Signature]
22/11/2022

[Signature] D. Chempaka Cup

PC 86/107

42	21	Semponnerunji	Rural	109	94	70	66	1	1	0	0	38	27	4	14	77	98
43	22	Nellikulam	Rural	45	43	19	13	5	6	0	0	21	24	0	0	46	41
44	23	Pillaiyar natham	Rural	54	14	0	0	40	9	0	0	14	5	73	111	31	44
45	24	Sethupuram	Rural	289	179	24	9	127	83	0	4	138	83	3	3	202	272
46	25	Illupaiyur	Rural	165	45	65	13	2	0	0	0	98	32	11	148	136	122
47	26	Silampatti	Rural	122	110	10	15	75	74	2	0	35	21	7	12	56	32
48	27	Velanoorani	Rural	821	662	352	42	210	485	10	4	249	131	311	446	597	564
Aruppukkottai Sub-District, Virudhunagar District																	
49	1	Poyyankulam	Rural	180	170	29	31	12	38	5	5	134	96	174	150	242	318
50	2	Kurunjakulam	Rural	385	332	35	37	48	85	0	1	302	209	16	17	228	289
51	3	Puliyuran	Rural	511	308	15	5	178	170	0	1	318	132	242	259	538	676
52	4	Sembatti	Rural	1021	732	240	251	175	208	12	20	594	253	207	265	708	947
53	5	Mettuthottiyangulam	Rural	326	330	19	20	204	279	2	4	101	27	3	3	207	218
54	6	Kanjanaiyakkenpatti	Rural	1505	473	147	28	88	64	32	25	1238	356	65	137	1202	2097
55	7	Aruppukkottai	Rural	123	100	3	1	20	22	0	0	100	77	5	2	139	35
56	8	Chettikurichi	Rural	1212	791	227	173	269	433	15	10	701	175	266	361	980	1348
57	9	Thammanaickenpatti	Rural	132	104	27	17	27	63	0	0	78	24	3	13	76	76
58	10	Vedanatham	Rural	96	48	4	2	31	30	1	0	60	16	136	131	120	150
59	11	Silukkapatti	Rural	158	168	1	0	134	161	0	0	23	7	0	0	96	94
60	12	Mandapasalai	Rural	1317	958	350	290	222	410	29	16	716	242	29	138	967	1282
61	13	Maravarperungudi	Rural	636	590	4	2	531	538	1	5	100	45	6	4	346	389
62	14	Vadakkukoppuchithampatti	Rural	137	130	1	1	128	117	0	0	8	12	1	3	93	92
63	15	T.Koppuchithampatti	Rural	243	107	29	1	109	90	2	2	103	14	6	1	167	313
64	16	Thummuchinnampatti	Rural	414	275	25	8	227	222	4	3	158	42	317	317	538	608
Kamuthi Sub-District, Ramanathapuram District																	
65	1	Mudimannarkottai	Rural	904	632	144	77	456	440	38	6	266	109	158	193	900	1087
Aruppukkottai Sub-District, Virudhunagar District																	
66	1	Aruppukkottai (M)	Urban	25125	10854	162	38	377	387	2471	2756	22115	7673	844	808	17589	32502
67	2	Palayampatti (CT)	Urban	5006	2362	100	34	608	816	306	317	3992	1195	408	408	3850	6542
68	3	Athipatti (CT)	Urban	2143	819	57	12	22	12	14	15	2050	780	360	338	1713	3011
total (C)				49315	25430	2992	1870	6245	7086	3025	3251	37053	13223	4241	5178	36364	59597
Grand Total (A+B+C)				56462	30797	4083	2904	8103	9335	3108	3355	41168	15203	4691	5786	41550	66305

*Source: District Primary Census Abstract, Virudhunagar & Ramanathapuram District of Tamilnadu State-2011.

EDUCATIONAL FACILITIES IN THE STUDY AREA

Sl.No	No. of Villages	Name of village	Educational Facilities (A(1)/NA(2))	Govt Pre - Primary School (Nursery/LKG/UKG) (Numbers)	Govt Primary School (Numbers)	Govt Middle School (Numbers)	Govt Secondary School (Numbers)	Govt Senior Secondary School (Numbers)	Govt Arts and Science Degree College (Numbers)	Govt Engineering College (Numbers)	Govt Medicine College (Numbers)	Govt Management Institute (Numbers)	Govt Polytechnic (Numbers)	Govt Vocational Training School/ITI (Numbers)	Government Non Formal Training Centre (Numbers)	Government School For Disabled (Numbers)
0-2 km,Aruppukkottai Sub-District, Virudhunagar District																
1	1	Kurunaikulam	1	2	2	0	0	0	0	0	0	0	0	0	2	0
2	2	Konganakurichi	1	1	1	0	0	0	0	0	0	0	0	0	1	0
3	3	Kalyanasundarapuram	1	1	1	0	0	0	0	0	0	0	0	0	1	0
		total (A)	3	4	4	0	0	0	0	0	0	0	0	0	4	0
2-5 km,Tiruchuli Sub-District, Virudhunagar District																
4	1	Keelakandamangalam	2	0	0	0	0	0	0	0	0	0	0	0	0	0
5	2	T.Karisalkulam	1	1	1	0	0	0	0	0	0	0	0	0	1	0
6	3	Chittalakundu	1	1	1	1	0	0	0	0	0	0	0	0	1	0
Tiruchuli Sub-District, Virudhunagar District																
7	1	Kulasekaranallur	1	3	1	1	1	0	0	0	0	0	0	0	2	0
8	2	Mangulam	1	1	1	0	0	0	0	0	0	0	0	0	1	0
9	3	Melakandamangalam	1	1	1	1	0	0	0	0	0	0	0	0	1	0
10	4	Aladipatti	1	1	1	0	0	0	0	0	0	0	0	0	1	0
11	5	Bommakottai	1	1	0	0	0	0	0	0	0	0	0	0	0	0
12	6	Kallorani	1	2	0	0	0	0	0	0	0	0	0	0	0	0
13	7	Savasapuram	1	2	1	1	0	0	0	0	0	0	0	0	1	0
14	8	Podampatti	1	1	1	0	0	0	0	0	0	0	0	0	0	0
15	9	Kullampatti	1	1	1	0	0	0	0	0	0	0	0	0	1	0
16	10	Muthuramalingapuram	1	2	1	1	1	1	0	0	0	0	0	0	2	0
17	11	Narthampatti	1	1	1	0	0	0	0	0	0	0	0	0	1	0
18	12	Kalayarkarisalkulam	1	1	1	0	0	0	0	0	0	0	0	0	1	0
19	13	Kallumadam	1	1	2	1	0	0	0	0	0	0	0	0	2	0
20	14	Erasinnampatti	1	1	1	0	0	0	0	0	0	0	0	0	1	0
21	15	Parattanatham	1	1	0	0	0	0	0	0	0	0	0	0	0	0
		total (B)	19	22	15	6	2	1	0	0	0	0	0	0	16	0
5-10 km,Tiruchuli Sub-District, Virudhunagar District																
22	1	Pannaimoonadradaippu	1	2	0	0	0	0	0	0	0	0	0	0	0	0
23	2	Udayarendal	2	0	0	0	0	0	0	0	0	0	0	0	0	0
24	3	Sennilakkudi	1	1	1	0	0	0	0	0	0	0	0	0	1	0
25	4	Udaiyananpatti	1	1	1	1	1	0	0	0	0	0	0	0	1	0
26	5	Kutchampatti	1	1	1	0	0	0	0	0	0	0	0	0	1	0
27	6	Pillaiarthottaiyankulam	1	1	1	1	1	1	0	0	0	0	0	0	1	0
28	7	Manavarayanendal	2	0	0	0	0	0	0	0	0	0	0	0	0	0
29	8	Pulikurichi	1	1	1	1	0	0	0	0	0	0	0	0	2	0
30	9	Nadakulam	2	0	0	0	0	0	0	0	0	0	0	0	0	0
31	10	Kurudankulam	2	0	0	0	0	0	0	0	0	0	0	0	0	0
32	11	Ambaneri	1	0	1	0	0	0	0	0	0	0	0	0	1	0

33	12	Uranippatti	2	0	0	0	0	0	0	0	0	0	0	0	0	0
34	13	Kokkulam	2	0	0	0	0	0	0	0	0	0	0	0	0	0
35	14	Soochaneri	1	1	2	0	0	0	0	0	0	0	0	0	2	0
36	15	Pallimadam	1	0	1	0	0	0	0	0	0	0	0	0	1	0
37	16	Tiruchuli	1	4	5	2	2	2	0	0	0	0	0	0	5	0
38	17	Paraikulam	1	0	1	0	0	0	0	0	0	0	0	0	0	0
39	18	Vadapalai	2	0	0	0	0	0	0	0	0	0	0	0	0	0
40	19	Konappanendal	1	1	1	0	0	0	0	0	0	0	0	0	0	0
41	20	Panaiyur	1	1	1	1	1	0	0	0	0	0	0	0	2	0
42	21	Semponnerunji	1	1	1	1	0	0	0	0	0	0	0	0	1	0
43	22	Nellikulam	2	0	0	0	0	0	0	0	0	0	0	0	0	0
44	23	Pillaiyar natham	1	1	1	0	0	0	0	0	0	0	0	0	1	0
45	24	Sethupuram	1	2	2	0	0	0	0	0	0	0	0	0	2	0
46	25	Illuppaiyur	1	1	1	1	1	1	0	0	0	0	0	0	2	0
47	26	Silampatti	1	1	1	0	0	0	0	0	0	0	0	0	1	0
48	27	Velanoorani	1	4	3	2	0	0	0	0	0	0	0	0	3	0
Aruppukkottai Sub-District, Virudhunagar District																
49	1	Poyyankulam	1	1	1	0	0	0	0	0	0	0	0	0	1	0
50	2	Kurunjakulam	1	1	0	0	0	0	0	0	0	0	0	0	0	0
51	3	Puliyuran	1	3	1	0	0	0	0	0	0	0	0	0	0	0
52	4	Sembatti	1	1	1	1	1	0	0	0	0	0	0	0	2	0
53	5	Mettuthottiyangulam	1	1	1	0	0	0	0	0	0	0	0	0	1	0
54	6	Kanjanaiyakkenpatti	1	2	0	0	0	0	0	0	0	0	0	0	0	0
55	7	Aruppukkottai	1	10	2	0	1	0	0	0	0	0	0	0	0	0
56	8	Chettikurichi	1	6	4	1	1	1	0	0	0	0	0	0	4	0
57	9	Thammanaickenpatti	1	1	0	0	0	0	0	0	0	0	0	0	0	0
58	10	Vedanatham	1	1	0	0	0	0	0	0	0	0	0	0	0	0
59	11	Silukkapatti	2	0	0	0	0	0	0	0	0	0	0	0	0	0
60	12	Mandapasalai	1	2	1	1	1	1	0	0	0	0	0	0	2	0
61	13	Maravarperungudi	1	3	3	1	1	0	0	0	0	0	0	0	3	0
62	14	Vadakkukoppuchithampatti	2	0	0	0	0	0	0	0	0	0	0	0	0	0
63	15	T.Koppuchithampatti	1	2	2	0	0	0	0	0	0	0	0	0	2	0
64	16	Thummuchinnampatti	1	1	1	1	1	1	0	0	0	0	0	0	1	0
Kamuthi Sub-District, Ramanathapuram District																
65	1	Mudimannarkottai	1	1	1	0	0	0	0	0	0	0	0	0	1	0
		total (C)	54	60	44	15	12	7	0	0	0	0	0	0	44	0
		Grand Total (A+B+C)	76	86	63	21	14	8	0	0	0	0	0	0	64	0

*Source: District Primary Census Abstract, Virudhunagar & Ramanathapuram District of Tamilnadu State-2011

MEDICAL FACILITIES WITHIN THE STUDY AREA

Sl.No	No. of Villages	Name of village	Medical Facilities (A(1)/NA(2))	Community Health Centre (Numbers)	Primary Health Centre (Numbers)	Primary Health Sub Centre (Numbers)	Maternity And Child Welfare Centre (Numbers)	TB Clinic (Numbers)	Hospital Allopathic (Numbers)	Hospital Alternative Medicine (Numbers)	Dispensary (Numbers)	Veterinary Hospital (Numbers)	Mobile Health Clinic (Numbers)	Family Welfare Centre (Numbers)
0-2 km,Aruppukkottai Sub-District, Virudhunagar District														
1	1	Kurunaikulam	2	0	0	0	0	0	0	0	0	0	0	0
2	2	Konganakurichi	2	0	0	0	0	0	0	0	0	0	0	0
3	3	Kalyanasundarapuram	2	0	0	0	0	0	0	0	0	0	0	0
		total (A)	6	0	0	0	0	0	0	0	0	0	0	0
2-5 km,Tiruchuli Sub-District, Virudhunagar District														
4	1	Keelakandamangalam	1	0	0	1	0	0	0	0	0	0	0	0
5	2	T.Karisalkulam	2	0	0	0	0	0	0	0	0	0	0	0
6	3	Chittalakundu	2	0	0	0	0	0	0	0	0	0	0	0
Tiruchuli Sub-District, Virudhunagar District														
7	1	Kulasekaranallur	1	0	0	1	0	0	0	0	0	0	0	0
8	2	Mangulam	2	0	0	0	0	0	0	0	0	0	0	0
9	3	Melakandamangalam	2	0	0	0	0	0	0	0	0	0	0	0
10	4	Aladipatti	1	0	0	1	0	0	0	0	0	0	0	0
11	5	Bommakottai	1	0	0	1	0	0	0	0	0	0	0	0
12	6	Kallorani	1	0	1	1	1	1	0	0	1	0	0	1
13	7	Savaspuram	1	0	0	1	0	0	0	0	0	0	0	0
14	8	Podampatti	2	0	0	0	0	0	0	0	0	0	0	0
15	9	Kullampatti	2	0	0	0	0	0	0	0	0	0	0	0
16	10	Muthuramalingapuram	1	0	0	1	0	0	0	0	0	1	0	0
17	11	Narthampatti	2	0	0	0	0	0	0	0	0	0	0	0
18	12	Kalayarkarisalkulam	2	0	0	0	0	0	0	0	0	0	0	0
19	13	Kallumadam	2	0	0	0	0	0	0	0	0	0	0	0
20	14	Erasinnampatti	2	0	0	0	0	0	0	0	0	0	0	0
21	15	Parattanatham	2	0	0	0	0	0	0	0	0	0	0	0
		total (B)	29	0	1	7	1	1	0	0	1	1	0	1
5-10 km,Tiruchuli Sub-District, Virudhunagar District														
22	1	Pannaimoonadradaippu	2	0	0	0	0	0	0	0	0	0	0	0
23	2	Udayarendal	2	0	0	0	0	0	0	0	0	0	0	0
24	3	Sennilakkudi	2	0	0	0	0	0	0	0	0	0	0	0
25	4	Udaiyananpatti	2	0	0	0	0	0	0	0	0	0	0	0
26	5	Kutchampatti	1	0	0	1	0	0	0	0	0	0	0	0
27	6	Pillaiarthottaiyankulam	1	0	0	1	0	0	0	0	0	0	0	0
28	7	Manavarayanendal	2	0	0	0	0	0	0	0	0	0	0	0
29	8	Pulikulurichi	2	0	0	0	0	0	0	0	0	0	0	0
30	9	Nadakulam	2	0	0	0	0	0	0	0	0	0	0	0
31	10	Kurudankulam	2	0	0	0	0	0	0	0	0	0	0	0
32	11	Ambaneri	2	0	0	0	0	0	0	0	0	0	0	0
33	12	Uranippatti	2	0	0	0	0	0	0	0	0	0	0	0
34	13	Kokkulam	2	0	0	0	0	0	0	0	0	0	0	0
35	14	Soochaneri	2	0	0	0	0	0	0	0	0	0	0	0
36	15	Pallimadam	2	0	0	0	0	0	0	0	0	0	0	0
37	16	Tiruchuli	1	0	0	1	1	1	0	0	0	1	0	0
38	17	Paraikulam	2	0	0	0	0	0	0	0	0	0	0	0

39	18	Vadapalai	2	0	0	0	0	0	0	0	0	0	0	0
40	19	Konappanendal	2	0	0	0	0	0	0	0	0	0	0	0
41	20	Panaiyur	1	0	0	1	1	0	0	0	0	0	0	0
42	21	Semponnerunji	2	0	0	0	0	0	0	0	0	0	0	0
43	22	Nellikulam	2	0	0	0	0	0	0	0	0	0	0	0
44	23	Pillaiyar natham	2	0	0	0	0	0	0	0	0	0	0	0
45	24	Sethupuram	2	0	0	0	0	0	0	0	0	0	0	0
46	25	Illuppaiyur	1	0	0	1	0	0	0	0	0	1	0	0
47	26	Silampatti	2	0	0	0	0	0	0	0	0	0	0	0
48	27	Velanoorani	1	0	0	1	0	0	0	0	0	0	0	0
Aruppukkottai Sub-District, Virudhunagar District														
49	1	Poyyankulam	2	0	0	0	0	0	0	0	0	0	0	0
50	2	Kurunjakulam	2	0	0	0	0	0	0	0	0	0	0	0
51	3	Puliyuran	1	0	0	1	0	0	0	0	0	0	0	0
52	4	Sembatti	1	0	0	1	0	0	0	0	0	0	0	0
53	5	Mettuthottiyangulam	1	0	0	1	0	0	0	0	0	0	0	0
54	6	Kanjanaiyakkenpatti	1	0	0	1	0	0	0	0	0	0	0	0
55	7	Aruppukkottai	1	0	0	0	1	1	0	0	0	0	0	0
56	8	Chettikurichi	1	0	0	2	0	0	0	0	0	1	0	0
57	9	Thammanaickenpatti	2	0	0	0	0	0	0	0	0	0	0	0
58	10	Vedanatham	2	0	0	0	0	0	0	0	0	0	0	0
59	11	Silukkapatti	2	0	0	0	0	0	0	0	0	0	0	0
60	12	Mandapasalai	1	1	1	1	1	1	0	0	1	1	0	1
61	13	Maravarperungudi	1	0	0	1	0	0	0	0	0	0	0	0
62	14	Vadakkukoppuchithampatti	2	0	0	0	0	0	0	0	0	0	0	0
63	15	T.Koppuchithampatti	1	0	0	1	0	0	0	0	0	0	0	0
64	16	Thummuchinnampatti	2	0	0	0	0	0	0	0	0	0	0	0
Kamuthi Sub-District, Ramanathapuram District														
65	1	Mudimannarkottai	1	0	0	1	0	0	0	0	0	0	0	0
		total (C)	72	1	1	16	4	3	0	0	1	4	0	1
		Grand Total (A+B+C)	107	1	2	23	5	4	0	0	2	5	0	2

*Source: District Primary Census Abstract, Virudhunagar & Ramanathapuram District of Tamilnadu State-2011

Note : A: Available, NA-Not Available

37	16	Tiruchuli	1	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1
38	17	Paraikulam	1	1	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2
39	18	Vadapalai	1	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2
40	19	Konappanendal	2	2	1	2	2	2	2	2	2	2	1	1	1	2	2	2	2
41	20	Panaiyur	2	2	2	2	2	2	2	2	1	2	1	1	1	2	2	2	2
42	21	Semponnerunji	1	1	2	2	2	2	2	2	2	2	1	1	1	2	2	2	2
43	22	Nellikulam	1	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2
44	23	Pillaiyar natham	1	2	2	1	2	2	2	2	2	2	2	1	1	2	2	2	2
45	24	Sethupuram	2	2	2	2	2	2	2	2	2	2	1	1	1	2	2	2	2
46	25	Illuppaiyur	1	2	2	2	2	2	2	2	1	2	1	1	1	2	2	2	1
47	26	Silampatti	1	2	2	1	2	2	2	2	2	2	2	1	1	2	2	2	2
48	27	Velanoorani	1	1	2	2	2	2	2	2	2	2	1	1	1	2	2	2	2
Aruppukottai Sub-District, Virudhunagar District																			
49	1	Poyyankulam	1	2	2	2	2	2	2	2	2	2	1	1	1	2	2	2	2
50	2	Kurunjakulam	1	2	1	1	2	2	2	2	2	2	1	1	1	2	2	2	2
51	3	Puliyuran	1	1	1	1	2	2	2	2	1	2	1	1	1	2	2	2	1
52	4	Sembatti	2	2	1	1	2	2	2	2	1	2	1	1	1	2	2	2	2
53	5	Mettuthottiyangulam	1	1	1	1	2	2	2	2	2	2	1	1	1	2	2	2	2
54	6	Kanjanaiyakkenpatti	1	1	1	1	2	2	2	2	2	2	1	1	1	2	2	2	2
55	7	Aruppukottai	1	2	2	1	2	2	2	1	1	1	1	1	1	1	1	1	1
56	8	Chettikurichi	1	1	1	1	2	2	2	2	1	2	1	1	1	2	2	2	1
57	9	Thammanaickenpatti	1	1	1	2	2	2	2	2	2	2	1	1	1	2	2	2	2
58	10	Vedanatham	1	2	1	1	2	2	2	2	1	2	1	1	1	2	2	2	2
59	11	Silukkapatti	1	2	1	1	2	2	2	2	2	2	1	1	2	2	2	2	2
60	12	Mandapasalai	1	1	2	1	2	2	2	2	1	2	1	1	1	2	2	1	2
61	13	Maravarperungudi	1	2	2	2	2	2	2	2	1	2	1	1	1	2	2	1	2
62	14	Vadakkukoppuchithampatti	1	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2
63	15	T.Koppuchithampatti	1	1	1	1	2	2	2	2	1	2	1	1	1	2	2	1	2
64	16	Thummuchinnampatti	1	2	2	2	2	2	2	2	1	2	1	1	1	2	2	2	2
Kamuthi Sub-District, Ramanathapuram District																			
65	1	Mudimannarkottai	2	1	1	1	2	2	2	2	1	2	1	1	1	2	2	1	1

*Source: District Primary Census Abstract, Virudhunagar & Ramanathapuram District of Tamilnadu State-2011

Note : A: Available, NA- Not Available

Status: A(1)/NA(2)



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AMBIENT AIR QUALITY

Project	:	Rough Stone & Gravel Quarry of TMT.R.Chempakadevi
Name of the Location	:	Near Mine Lease Area
Station Code	:	A1

SL.NO	DATE	PM10	PM2.5	SO2	NO2
1	07.03.2023	49.8	22.9	5.7	8.1
2	08.03.2023	53.1	24.4	6.1	8.5
3	18.03.2023	44.2	20.3	5.1	7.4
4	19.03.2023	47.4	27.9	5.4	7.8
5	21.03.2023	50.6	23.4	5.8	8.2
6	22.03.2023	52.2	24.1	6.1	8.4
7	01.04.2023	45.4	20.9	5.1	7.5
8	02.04.2023	56.2	25.8	6.5	9.3
9	04.04.2023	40.2	18.5	4.5	6.9
10	05.04.2023	43.4	20.1	4.9	7.3
11	15.04.2023	57.8	26.6	6.7	9.7
12	16.04.2023	53.8	24.7	6.2	8.7
13	18.04.2023	42.6	19.6	4.8	7.2
14	19.04.2023	49.3	22.7	5.6	8.1
15	29.04.2023	41.3	19.2	4.6	7.1
16	30.04.2023	46.6	21.4	5.3	7.7
17	02.05.2023	58.6	27.1	6.8	10.1
18	03.05.2023	55.4	25.5	6.4	9.1
19	13.05.2023	41.8	19.2	4.7	7.1
20	14.05.2023	45.8	21.1	5.2	7.6
21	16.05.2023	54.1	24.9	6.6	9.5
22	17.05.2023	54.6	25.1	6.3	8.9
23	27.05.2023	48.2	22.2	5.5	7.9
24	28.05.2023	51.4	23.6	5.9	8.3
	MIN	40.2	18.5	4.5	6.9
	AVE	49.3	23.0	5.7	8.2
	MAX	58.6	27.9	6.8	10.1

Note: BDL – Below Detectable Limit, DL: Detectable Limit.

Q. Paul

Prepared by



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AMBIENT AIR QUALITY

Project	:	Rough Stone & Gravel Quarry of TMT.R.Chempakadevi
Name of the Location	:	Aladipatti Village
Station Code	:	A2

SL.NO	DATE	PM10	PM2.5	SO2	NO2
1	07.03.2023	47.8	22.7	5.1	7.7
2	08.03.2023	53.3	25.3	5.6	8.2
3	18.03.2023	63.4	30.1	6.5	9.3
4	19.03.2023	59.9	28.5	6.2	8.8
5	21.03.2023	68.7	32.6	7.1	10.3
6	22.03.2023	64.3	30.5	6.6	9.5
7	01.04.2023	58.8	27.9	6.1	8.7
8	02.04.2023	67.6	32.1	6.9	10.1
9	04.04.2023	45.6	21.7	4.9	7.5
10	05.04.2023	51.1	24.3	5.4	8
11	15.04.2023	56.6	26.9	5.9	8.5
12	16.04.2023	61.2	29.1	6.3	8.9
13	18.04.2023	46.7	22.2	5	7.6
14	19.04.2023	52.2	24.8	5.5	8.1
15	29.04.2023	69.6	33.1	7.2	11.2
16	30.04.2023	66.5	31.6	6.8	9.9
17	02.05.2023	57.7	27.4	6.1	8.6
18	03.05.2023	65.4	31.1	6.7	9.7
19	13.05.2023	48.9	23.2	5.2	7.8
20	14.05.2023	54.4	25.8	5.7	8.3
21	16.05.2023	69.1	32.8	7.1	10.5
22	17.05.2023	62.1	29.5	6.4	9.1
23	27.05.2023	50.2	23.8	5.3	7.9
24	28.05.2023	55.5	26.4	5.8	8.4
	MIN	45.6	21.7	4.9	7.5
	AVE	58.2	27.6	6.1	8.9
	MAX	69.6	33.1	7.2	11.2

Note: BDL – Below Detectable Limit, DL: Detectable Limit.

Prepared by



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CREATIVE ENGINEERS & CONSULTANTS

(NABET ACCREDITED, NABL ACCREDITED TESTING LABORATORY,
DEPARTMENT OF INDUSTRIES AND COMMERCE REGISTERED COMPANY)

AMBIENT AIR QUALITY

Project	:	Rough Stone & Gravel Quarry of TMT.R.Chempakadevi
Name of the Location	:	Kalaiyarkarisalkulam Village
Station Code	:	A3

SL.NO	DATE	PM10	PM2.5	SO2	NO2
1	09.03.2023	43.8	19.9	5.2	7.9
2	10.03.2023	46.2	21.0	5.6	8.3
3	16.03.2023	39.1	17.8	4.4	7.1
4	17.03.2023	41.4	18.8	4.8	7.5
5	23.03.2023	50.4	22.9	6.3	9.2
6	24.03.2023	45.6	20.7	5.5	8.2
7	30.03.2023	42.6	19.4	5.1	7.7
8	31.03.2023	45.3	20.6	5.4	8.1
9	06.04.2023	44.4	20.2	5.3	8.1
10	07.04.2023	48.6	22.1	6.1	8.7
11	13.04.2023	39.6	18.0	4.5	7.2
12	14.04.2023	43.2	19.7	5.1	7.8
13	20.04.2023	51.6	23.5	6.5	9.6
14	21.04.2023	40.8	18.6	4.7	7.4
15	27.04.2023	52.8	24.0	6.7	10.6
16	28.04.2023	48.1	21.9	5.9	8.6
17	04.05.2023	40.2	18.3	4.6	7.3
18	05.05.2023	46.8	21.3	5.7	8.4
19	11.05.2023	49.8	22.7	6.2	9.1
20	12.05.2023	52.3	23.8	6.6	10.2
21	18.05.2023	42.4	19.3	4.9	7.6
22	19.05.2023	51.2	23.3	6.4	9.4
23	25.05.2023	47.4	21.6	5.8	8.5
24	26.05.2023	49.2	22.4	6.1	8.8
	MIN	39.1	17.8	4.4	7.1
	AVE	46.0	20.9	5.6	8.4
	MAX	52.8	24.0	6.7	10.6

Note: BDL – Below Detectable Limit, DL: Detectable Limit.

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AMBIENT AIR QUALITY

Project	:	Rough Stone & Gravel Quarry of TMT.R.Chempakadevi
Name of the Location	:	Muthuramalingapuram Village
Station Code	:	A4

SL.NO	DATE	PM10	PM2.5	SO2	NO2
1	09.03.2023	39.9	18.4	4.8	7.1
2	10.03.2023	42.3	19.5	5.4	7.7
3	16.03.2023	47.5	21.9	6.7	10.3
4	17.03.2023	43.1	19.9	5.6	8.1
5	23.03.2023	40.7	18.8	5.1	7.3
6	24.03.2023	42.7	19.7	5.5	7.9
7	30.03.2023	39.1	18.1	4.6	6.9
8	31.03.2023	41.5	19.2	5.2	7.5
9	06.04.2023	40.3	18.6	4.9	7.2
10	07.04.2023	41.9	19.4	5.3	7.6
11	13.04.2023	49.1	22.7	6.9	10.7
12	14.04.2023	44.7	20.7	6.1	8.9
13	20.04.2023	43.5	20.1	5.7	8.3
14	21.04.2023	45.9	21.2	6.3	9.5
15	27.04.2023	39.5	18.2	4.7	7.1
16	28.04.2023	43.9	20.3	5.8	8.5
17	04.05.2023	47.1	21.8	6.6	10.1
18	05.05.2023	45.5	21.0	6.2	9.3
19	11.05.2023	44.3	20.5	5.9	8.7
20	12.05.2023	46.7	21.6	6.5	9.9
21	18.05.2023	46.3	21.4	6.4	9.7
22	19.05.2023	41.1	19.0	5.1	7.4
23	25.05.2023	48.3	22.3	6.8	10.5
24	26.05.2023	45.1	20.8	6.1	9.1
	MIN	39.1	18.1	4.6	6.9
	AVE	43.8	20.2	5.8	8.6
	MAX	49.1	22.7	6.9	10.7

Note: BDL – Below Detectable Limit, DL: Detectable Limit.

Prepared by



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AMBIENT AIR QUALITY

Project	:	Rough Stone & Gravel Quarry of TMT.R.Chempakadevi
Name of the Location	:	Meenashipuram Village
Station Code	:	A5

SL.NO	DATE	PM10	PM2.5	SO2	NO2
1	11.03.2023	52.7	24.0	6.2	8.9
2	12.03.2023	49.4	22.5	5.5	7.7
3	14.03.2023	51.8	23.6	6.0	8.5
4	15.03.2023	48.5	22.1	5.3	7.5
5	25.03.2023	52.2	23.8	6.1	8.7
6	26.03.2023	45.6	20.7	4.8	7.0
7	28.03.2023	42.7	19.4	4.2	6.4
8	29.03.2023	46.5	21.2	4.9	7.1
9	08.04.2023	53.6	24.4	6.3	9.1
10	09.04.2023	50.1	22.8	5.6	7.8
11	11.04.2023	43.9	20.0	4.4	6.6
12	12.04.2023	45.4	20.7	4.7	6.9
13	22.04.2023	46.9	21.3	5.0	7.2
14	23.04.2023	43.6	19.8	4.3	6.5
15	25.04.2023	44.5	20.2	4.5	6.7
16	26.04.2023	47.9	21.8	5.2	7.4
17	06.05.2023	54.4	24.8	6.5	9.5
18	07.05.2023	50.8	23.1	5.8	8.1
19	09.05.2023	48.9	22.2	5.4	7.6
20	10.05.2023	51.4	23.4	5.9	8.3
21	20.05.2023	44.7	20.3	4.6	6.8
22	21.05.2023	47.3	21.5	5.1	7.3
23	23.05.2023	53.6	24.4	6.4	9.3
24	24.05.2023	50.4	22.9	5.7	7.9
	MIN	42.7	19.4	4.2	6.4
	AVE	48.6	22.1	5.4	7.7
	MAX	54.4	24.8	6.5	9.5

Note: BDL – Below Detectable Limit, DL: Detectable Limit.

Prepared by



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WATER QUALITY DATA

Project Name	:	Rough Stone Quarry of Tmt.R.Chempakadevi	
Location Name	:	Location Code	Location Name
		W1	Near Mine Lease Area
		W2	Aladipatti Village
		W3	Kalaiyarkarisalkulam Village
		W4	Muthuramalingapuram Village
		W5	Meenashipuram Village

S. No.	Parameter	Unit	W1	W 2	W 3	W 4	W 5	*Permissible Limits
1	Odour	-	AGREEABLE	Agreeable	Agreeable	Agreeable	Agreeable	AGREEABLE
2	Turbidity	NTU	<1	<1	<1	<1	<1	-
3	pH at 25 °C	-	7.98	7.72	7.65	7.55	7.98	6.5-8.5
4	Electrical Conductivity	µmhos/cm	698.5	1694	1245	637.3	543.6	-
5	Total Dissolved Solids	mg/L	420	1018	750	384	328	2000
6	Total hardness as CaCO ₃	mg/L	202	385	305	320	224	600
7	Calcium as Ca	mg/L	52.0	106.0	79.2	84.0	56.8	200
8	Magnesium as Mg	mg/L	17.3	28.8	25.7	26.4	19.7	100
9	Calcium as CaCO ₃	mg/L	130	265	198	210	142	-

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S. No.	Parameter	Unit	W1	W 2	W 3	W 4	W 5	*Permissible Limits
10	Magnesium as CaCO ₃	mg/L	72.0	120	107	110	82.0	-
11	Total alkalinity as CaCO ₃	mg/L	186	272	305	214	176	600
12	Chloride as Cl	mg/L	124	455	320	102	68.9	1000
13	Free Residual chlorine as Cl	mg/L	BDL (D.L - 0.2)	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⁻	mg/L	65.2	220	114	24.6	32.5	400
15	Iron as Fe	mg/L	BDL(D.L - 0.01)	0.05	0.06	BDL(D.L - 0.01)	BDL(D.L - 0.01)	0.3
16	Nitrate as NO ₃	mg/L	3.20	2.05	2.9	BDL(D.L - 1.0)	3.24	45
17	Fluoride as F	mg/L	0.14	0.35	0.29	0.18	0.11	1.5
18	Manganese as Mn	mg/L	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)	0.0

Note: * The water quality of the collected ground water samples were found to be within the prescribed permissible limits of IS: 10500:2012 Norms for Drinking in the absence of an alternative source.


Prepared by



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39	16	Uranippatti	81.73	0	14.96	0	0	0	0	54.51	0	2.57	9.69
40	17	Kokkulam	222.61	0	49.3	0	0	0	79.82	42.93	7.79	0	42.77
41	18	Soochaneri	350.78	0	74.67	0	0	0	0	227.37	0.14	11.5	37.1
42	19	Pallimadam	241.48	0	79.29	0	0	15	0	119.09	0	0	28.1
43	20	Tiruchuli	1687.55	0	509.66	0	0	0	0	0.81	1030.36	86.52	60.2
44	21	Udichchiyendal	28.65	0	10.61	0	0	0	0.01	6.96	0.98	0	10.09
45	22	Paraikulam	158.04	0	53.36	1.48	0	0	0	55.07	15.63	0	32.5
46	23	Vadapalai	136.88	0	31.64	0	0	0	0	50.46	0	2.41	52.37
47	24	Konappanendal	49.19	0	4.37	0	0	0	0.06	29.45	0	11.46	3.85
48	25	Panaiyur	429.07	0	65.13	0.46	0	0	0	298.32	33.27	16.58	15.31
49	26	Semponnerunji	174.17	0	33.66	0	0	0	3.02	117.19	0.63	0	19.67
50	27	Nellikulam	95.37	0	15.07	0	0	0	0	64.54	0.91	1.52	13.33
51	28	Pillaiyarnatham	482.53	0	69.87	0	0	0	0	290.08	20.6	67.24	34.74
52	29	Sethupuram	638.55	0	135.89	0	0	0	0	260.39	106.1	83.18	52.99
53	30	Illuppaiyur	384.14	0	47.65	0	0	4.17	273.98	0.02	6.63	23.87	27.82
54	31	Silampatti	247.39	0	16.22	0	0	0	0.08	91.83	8.25	130.09	0.92
55	32	Velanoorani	1338.26	0	69.91	0	0	0	2.68	863.73	0	264.41	137.53
Aruppukkottai Sub-District, Virudhunagar District													
56	1	Poyyankulam	153.86	0	10.42	0	0	0	0	0	59.09	71.87	12.48
57	2	Kurunjakulam	130.58	0	15.42	0	0	0	0	0	57.72	34.99	22.45
58	3	Puliyuran	948.35	0	156.33	0	0	0	0	0.71	400.56	324	66.75
59	4	Sembatti	520.08	0	50	60.26	0	10	54	4.67	0	305	36.15
60	5	Mettuthottiyangulam	185.02	0	31.89	0	0	0	0	0	97.13	42.57	13.43
61	6	Kanjanaiyakkenpatti	626.29	0	47.44	0	0	0	0.29	0	219.59	358.97	0
62	7	Aruppukkottai	1859.2	0	11.2	300.1	0	0	877.32	50.2	30.1	524.5	65.78
63	8	Chettikurichi	2989.53	0	298.87	0	0	7.7	0	1185.72	349.66	1109.1	38.48
64	9	Thammanaickenpatti	365.09	0	26.48	0	0	0	0	0	163.62	174.99	0
65	10	Vedanatham	644.35	0	27.42	0	0	0	1.51	226.74	0	388.68	0
66	11	Silukkapatti	60.23	0	4.91	0	0	0	0.29	11.03	1.44	26.7	15.86
67	12	Mandapasalai	1341.76	0	97.33	0	0	0	0.36	0	304.44	928.92	10.71
68	13	Maravarperungudi	1454.04	0	112.09	17	21.39	4.62	518.37	195.73	0	507.16	77.68
69	14	Vadakkukoppuchithampatti	473.3	0	40.15	0	0	6.11	0	175.32	0	250.53	1.19
70	15	T.Koppuchithampatti	2284.45	0	116.18	0	0	0	0	0.33	632.1	1535.84	0
71	16	Thummuchinnampatti	1231.08	0	109.73	0	0	0	0	0.67	631.14	445.74	43.8
Kamuthi Sub-District, Ramanathapuram District													
72	1	Mudimannarkottai	1290	0	114.99	0	0	0	0	33.33	148.6	880.23	112.85
		total (C)	28159.61	0	3638.46	379.43	23.89	47.6	1844.83	5908.83	5600.05	8988.92	1727.6
		Grand Total (A+B+C)	37689.98	0	4825.97	448.07	23.89	93.66	1890.11	8771.96	6751.9	12388.4	2496.02

*Source: District Primary Census Abstract, Virudhunagar & Ramanathapuram District of Tamilnadu State-2011

91

உருதுநகர் கனவட்டம் சிவபுத்திரமடம்
 உட்பட வெள்ளமேட்டை உட்கரை கிராமம்
 சிவபுத்திரமடம் கிராமத்தில் புனசைய புல தென்சை
 சிவபுத்திரமடம் 44-1, 44-5, 44-6, 44-7, 2019 ஆம் 44-8
 உருதுநகர்மடம் சிவபுத்திரமடம் 0.82.00, 0.39.5, 0.14.50,
 0.14.50, 0.43.00 மொத்தம் மொத்தம்
 1.93.50 மொத்தம் புனசைய புலமடம் சிவபுத்திரமடம்
 உருதுநகர்மடம் சிவபுத்திரமடம் தென்சைபுத்திரமடம் w/o
 T.R. உருதுநகர் தென்சைபுத்திரமடம் 577
 உருதுநகர்மடம் சிவபுத்திரமடம் உருதுநகர்மடம் - மேற்கரை
 புனசைய புலமடம் சிவபுத்திரமடம் 300 மீட்டர் சிவபுத்திரமடம்
 சிவபுத்திரமடம், சிவபுத்திரமடம், புனசைய புலமடம் புனசைய
 புனசைய புலமடம் சிவபுத்திரமடம் தென்சைபுத்திரமடம் உருதுநகர்மடம்
 தென்சைபுத்திரமடம் சிவபுத்திரமடம் சிவபுத்திரமடம் உருதுநகர்மடம்


 25/9/2022
 கிராம நிர்வாக அலுவலர்
 பொம்மகோட்டை கிராமம்
 அருப்புக்கோட்டை வட்டம்.

 P. Chempaka Devi

PC 91/104

MINING PLAN



and PROGRESSIVE MINE CLOSURE PLAN ROUGH STONE and GRAVEL QUARRY

(PREPARED UNDER RULE 12 OF MINOR MINERAL CONSERVATION & DEVELOPMENT RULES, 2010 & AS PER AMENDMENT UNDER RULE No. 41 & 42 of TAMILNADU MINOR MINERAL CONCESSION RULES, 1959)

Mining Plan & Lease Period – Five (5) years

LOCATION OF THE QUARRY LEASE AREA

EXTENT : 1.50.0 Hectares
SURVEY No. : 44/1(P), 44/5(P), 44/6,
44/7 & 44/8.
VILLAGE : SUNDAKOTTAI
TALUK : ARUPPUKOTTAI
DISTRICT : VIRUDHUNAGAR

Applicant

Tmt.R.CHEMPAKA DEVI,
W/o.T.R.VARDARAJAN
No.: 1, RAMASMY NAICKER STREET,
VADUGARKOTTAI,
ARUPPUKOTTAI TOWN & TALUK- 626 101.
VIRUDHUNAGAR DISTRICT.

68
Sign

PREPARED BY

R.GURURAMACHANDRAN, M.Sc.,
QUALIFIED PERSON (RQP/MAS/224/2010/A)

RC /s/ R. Chempaka Devi

2

Tmt. R.CHEMPAKADEVI
W/o. T.R.VARADARAJAN
1, RAMASAMY NAICKER STREET,
VADUGARKOTTAI,
ARUPPUKOTTAI TOWN & TALUK
VIRUDHUNAGAR DISTRICT - 626 101.



CONSENT LETTER OF THE APPLICANT

I hereby give my consent to prepare the Mining Plan for the grant of Quarry Lease for quarrying Rough Stone & Gravel over a total extent of 1.50.0 Hectares in SF. Nos.: 44/1(P), 44/5(P), 44/6, 44/7 & 44/8 of Sundakottai Village, Aruppucottai Taluk, Virudhunagar District for a period of Five years vide Assistant Director Geology & Mining, Virudhunagar District letter Na.Ka.No.KV1/878/2018-Kanimam dated 26.08.2022 and submit for approval before the Competent Authority by

Mr. R. Gururamachandran, M.Sc.,
Qualified Person - RQP/MAS/224/2010/A.

I request the Assistant Director Geology and Mining, Virudhunagar to make further correspondence regarding the modification of the Mining Plan if any with said Qualified Person in the following address:

No. 4/479A, Nandhikoil Theru,
E.B.Colony, Puliankulam,
Soolakkarai West,
Virudhunagar - 626 003.
Cell :9443434288 / 9750309288
email : gruram@gmail.com

I hereby undertake that all the modifications, if any, made in the Mining Plan by the Qualified Person may be deemed to have been made with my knowledge and consent and shall be acceptable by me and binding on me in all respect.

R.ChempakaDevi
Signature of the Applicant.

Place : Virudhunagar
Date :

RC

2/68

1

⊗

3



Tmt. R.CHEMPAKADEVI
W/o. T.R.VARADARAJAN
1, RAMASAMY NAICKER STREET,
VADUGARKOTTAI,
ARUPPUKOTTAI TOWN & TALUK
VIRUDHUNAGAR DISTRICT - 626 101.

DECLARATION OF THE APPLICANT

The Mining Plan in respect of the grant of quarry lease for quarrying of Rough Stone & Gravel over a total extent of 1.50.0 Hectares in SF. Nos.: 44/1(P), 44/5(P), 44/6, 44/7 & 44/8 of Sundakottai Village, Aruppukottai Taluk, Virudhunagar District for a period of Five years has been prepared and submitted for approval in full consultation with me.

I understand its contents and agree to implement the same in accordance with Laws, Rules and Act applicable to quarry Rough Stone and Gravel.

R. Chempaka Devi
R.ChempakaDevi
Signature of the Applicant

Place : Virudhunagar
Date :

This Mining is approved based on guidelines/ instructions issued in the CGM, Letter No.3868/LC/2012 dated 19-11-2012 and incorporation of the particulars specified in the latter Rec.No. KVI/372/2018.....
Dated...22/11/2022
Assistant Director of Geology and Mining, Virudhunagar and subject to further Fulfillment of the conditions stipulated in the Mining Plan under rule 41,42 of Tamil Nadu Mining and Mineral Concession Rules 1953.

[Signature]
Assistant Director of Geology & Mining
Virudhunagar

This Mining Plan is approved Subject to the conditions / Stipulation indicated in the Mining Plan Approval
Letter Roc. No. KVI/372/2018
Dated 22/11/2022

[Handwritten initials]
22/11/2022

R.C. 3/18
R. Chempaka Devi
[Handwritten mark]

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R.Gururamachandran , M.Sc.,
No. 4/479A, Nandhikoil Theru,
E.B.Colony, Puliankulam,
Soolakkarai West,
Virudhunagar – 626 003.
Cell :9443434288 / 9750309288
email : gruram@gmail.com




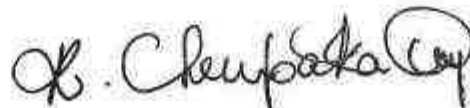
CERTIFICATE FROM THE QUALIFIED PERSON

This is to certify that the provisions of the Mines Act, Rules and Regulations, Minor Mineral Conservation and Development Rules, 2010 & as per Amendment Rules under Tamil Nadu Minor Mineral Concession Rules, 1959etc., made there under have been observed in the preparation of Mining Plan for Rough stone and Gravel quarry for Tmt.R.ChempakaDevi over an extent of 1.50.0 Hectares in SF. Nos.: 44/1(P), 44/5(P), 44/6, 44/7 & 44/8 of Sundakottai Village, Aruppukottai Taluk, Virudhunagar District for a period of Five years.

Where ever the necessary permissions / exemptions / relaxations and approvals are required, the applicant would approach the concerned authorities of State and Central Governments for granting such permissions etc..

Place : Virudhunagar
Date :


Qualified Person
R. GURURAMACHANDRAN, M.Sc.,
Qualified Person
(RQP/MAS/224/2010/A)



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CERTIFICATE FROM THE QUALIFIED PERSON

This is to Certify that, I R.Gururamachandran M.Sc., (App.Geo), having an office at No. 4/479A, Nandhikoil Theru, E.B.Colony, Puliankulam, Soolakkarai West, Virudhunagar - 626 003. I am a Post Graduate in Applied Geology from Madras University, AC Tech Campus.

Rule 15(I)(a) and (b) of Minerals (other than Atomic, Hydro Carbons Energy Minerals) Concession Rules 2016 stipulated the eligibility for preparing Mining plans as "(I)(a) a post graduate degree in Geology granted by a University established" and (I)(b) "Professional experience of five years of working in a supervisory capacity in the field of Mining after obtaining the degree". Since my qualification and experience are satisfied the Rule (I)(a) and (I)(b) of 15 of the said Rules, I am eligible to prepare Mining Plans for both Major and Minor minerals.

Accordingly, I prepared this Mining Plan for Rough Stone and Gravel quarry for Tmt.R.ChempakaDevi over an extent of 1.50.0 Hectares in SF. Nos.: 44/1(P), 44/5(P), 44/6, 44/7 & 44/8 of Sundakottai Village, Aruppukottai Taluk, Virudhunagar District

Place : Virudhunagar

Date :



Qualified Person

R. GURURAMACHANDRAN. M.Sc.,

Qualified Person

(RQP/MAS/224/2010/A)



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LIST OF CONTENTS

S.No.	CHAPTER	PAGE No.
1.0	GENERAL INFORMATION	10
2.0	LOCATION	11
PART - A		
3.0	GEOLOGY & MINERAL RESERVES	12
4.0	MINING	15
5.0	BLASTING	18
6.0	MINE DRAINAGE	19
7.0	OTHER PERMANENT STRUCTURES	20
8.0	EMPLOYMENT POTENTIAL & WELFARE MEASURES	21
PART - B		
9.0	ENVIRONMENT MANAGEMENT PLAN	23
10.0	MINE CLOSURE PLAN	27
11.0	ANY OTHER INFORMATION	29

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5
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7



LIST OF ANNEXURES

S.NO	DESCRIPTION	ANNEXURE
1	Copy of Precise Area Communication	I
2	Copy of Assistant Director Inspection Report	II
3	Copy of Aadhar & PAN card Id Proof of Applicant	III
4	Copy of FMB	IV
5	Copy of Patta, Adangal, A-Register & A-1 Notice	V
6	Site photos	VI
7	Copy of Qualified Person Certificates	VII

LIST OF PLATES

S.NO	DESCRIPTION	PLATE No.	SCALE
1	LOCATION PLAN	I	Not to Scale
2	ROUTE MAP	I A	Not to Scale
3	KEY PLAN	II	1 : 50,000
4	MINING LEASE PLAN	III	1 : 1,000
5	SURFACE & GEOLOGICAL PLAN & SECTIONS	IV	1 : 1,000
6	YEARWISE PRODUCTION PLAN & SECTIONS	V	1 : 1,000
7	CONCEPTUAL PLAN & SECTIONS	VI	1 : 1,000
8	ENVIRONMENTAL PLAN	VII	1 : 5,000
9	VILLAGE MAP SHOWING ENVIRONMENTAL FEATURES	VII A	1 : 5,000
10	LAND USE PATTERN	VII B	1 : 10,000
11	PROGRESSIVE MINE CLOSURE PLAN	VIII	1 : 1,000

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MINING PLAN

and PROGRESSIVE MINE CLOSURE PLAN for ROUGH STONE & GRAVEL QUARRY

Over an Extent of 1.50.0 Hectares in SF. Nos. 44/1(P),
44/5(P), 44/6, 44/7 & 44/8 of SUNDAKOTTAI VILLAGE,
ARUPPUKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU.

(Prepared Under Rule 12 of Minor Mineral Conservation and Development Rules, 2010 and as per
Amendment under Rule 41& 42 of Tamil Nadu Minor Mineral Concession Rules, 1959)


INTRODUCTION and EXECUTIVE SUMMARY :

This Mining Plan is prepared for Quarrying of Rough Stone and Gravel by systematic and scientific quarrying and to obtain Environment Clearance from State level Environmental Impact Assessment Authority (SELAA), Chennai. The applicant Tmt.R.ChempakaDevi, W/o.T.R.Varadarajan, Aruppucottai town is an individual having skill on Rough Stone and Gravel Quarrying. The Rough Stone is mainly used for crushing blue metal stone aggregates of various sizes and M-Sand for concrete mixing for building, road, bridges, etc., and Gravel for filling purposes for road and buildings.

The applicant applied this area afresh for quarrying & transportation of Rough Stone and Gravel over an extent of 1.50.0 Hectares in SF. Nos.: 44/1(P), 44/5(P), 44/6, 44/7 & 44/8 of Sundakkottai Village, Aruppucottai Taluk, Virudhunagar District under Rule 19 of Tamil Nadu Minor Mineral Concession Rules 1959 and the Assistant Director, Geology & Mining, Virudhunagar District communicated the precise area for the grant vide letter Na.Ka.No.:KV1/878/2018-Kanimam dated 26.08.2022 for a period of 5 years under Rule 19 (1) and 20 of Tamil Nadu Minor Mineral Concession Rules 1959 subject to the following conditions:


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R. GURURAMACHANDRAN, M.Sc.,
Qualified Person
(RQP/MAS/224/2010/A)

9

அருப்புக்கோட்டை, வருவாய் கோட்டாட்சியர் மற்றும் புவியியல் மற்றும் சுரங்கத்துறை, உதவி இயக்குநர் ஆகியோர் கீழ்க்காணும் நிபந்தனைகளுக்குப்பட்டு மேற்கண்ட புலங்களில் உடைகல் மற்றும் கிராவல் குவாரி குத்தகை உரிமம் ஐந்தாண்டுகளுக்கு வழங்க பரிந்துரை செய்துள்ளனர்.

- 1) அருகிலுள்ள பட்டா நிலங்களுக்கு 7.5 மீ பாதுகாப்பு இடைவெளி விடுத்து குவாரி செய்தல் வேண்டும்.
- 2) புலத்தின் தெற்கில் புல எண் 43-ல் செல்லும் ஓடை மற்றும் புறம்போக்கு நிலங்களுக்கு 10 மீட்டர் பாதுகாப்பு இடைவெளி விடுத்து குவாரி செய்தல் வேண்டும்.
- 3) பொதுமக்கள் / விவசாய நிலங்களுக்கு பாதிப்பு ஏற்படாத வகையில் தகுதி வாய்ந்த அங்கீகரிக்கப்பட்ட நபர்கள் மூலம் வெடிமருந்துகள் சேமிக்கப்பட்டு குவாரியில் வெடித்தல் வேண்டும். குவாரியில் குறைந்த சக்தி கொண்ட வெடி மருந்துகளை பயன்படுத்தல் வேண்டும்.
- 4) சுரங்கத்திட்டம் மற்றும் சுற்றுச்சூழல் தடையில்லாச் சான்று குத்தகை உரிமம் வழங்குவதற்கு முன் சமர்ப்பிக்க வேண்டும்.
- 5) குவாரியில் வேலை செய்யும் தொழிலாளர்கள் தொழிலாளர் நலவாரியம் மற்றும் காப்பீடு திட்டத்தில் பதிவு செய்து தொழிலாளர் நலன் பேண்பட வேண்டும்.
- 6) குழந்தை தொழிலாளர்களை குவாரி பணியில் அமர்த்தக் கூடாது.
- 7) கனிமங்களை வாகனங்களில் கொண்டு செல்லும் போது பாதுகாப்பிகள், பொது மக்கள் மற்றும் பிற வாகனங்கள் பாதிக்காதவண்ணம் தார்பாய்கள் கொண்டு மூடி எடுத்துச் செல்ல வேண்டும்.

எனவே, துறை அலுவலர்களின் பரிந்துரையினை ஏற்றும் நிபந்தனைகளுக்கு உட்பட்டும், விருதுநகர் மாவட்டம், அருப்புக்கோட்டை வட்டம், சுண்டக்கோட்டை கிராமம், பட்டா புல எண்கள்: 44/1 (P) (0.43.50), 44/5(P) (0.34.5), 44/6 (0.14.5), 44/7 (0.14.5) & 44/8 (0.43.0) மொத்தம் 1.50.00 ஹெக்டேர் நிலம் 1959 -ம் வருடத்திய தமிழ்நாடு சிறுகனிம சலுகை விதிகள் விதி எண்: 19 (1) மற்றும் 20 -ன் படி ஐந்து வருடகாலத்திற்கு உடைகல் மற்றும் கிராவல் குவாரி உரிமம் வழங்க தகுதி வாய்ந்த நிலப்பரப்பாக (Precise Area) கருதப்படுகிறது.

Hence, keeping all the conditions laid down by the department, this Mining Plan is prepared under Rule 41 & 42 of Tamil Nadu Minor Mineral Concession Rules 1959 for approval in order to obtain the Environmental Clearance from SEIAA-Chennai.

R/C 9/68⁸ K. Cheppala

10

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Executive Summary :

i. Area details :

District & Taluk	Village	Survey Nos.	Extent in Hectares.	Remarks
Virudhunagar Aruppukottai	Sundakottai	44/1(P),	0.43.5	Ryotwari Land Patta No. 577 of Sundakottai village revenue records.
		44/5(P),	0.34.5	
		44/6,	0.14.5	
		44/7 & 44/8	0.14.5	
		44/8	0.43.0	
		TOTAL	1.50.0	

ii. The Estimated Reserves are :

Rough Stone	Top soil & Gravel	Rough Stone	Top soil & Gravel
5,58,600	95,760	1,50,675	69,600

- iii. Topography of the area = The area is plain terrain.
- iv. Existing Depth of the quarried pit = Nil
- v. Proposed Total Depth of mining = 41.0m (Below ground level)
- vi. Proposed period of mining = 5 years
- vii. It is a new/Existing quarry lease = New Quarry Lease
- viii. Method of mining / level of mechanization = Opencast semi- mechanized method, the quarry operation involves shallow jack hammer drilling, slurry blasting.
- ix. Type of machineries proposed to be deployed in the quarrying operation.
Excavator of 0.90Cbm bucket capacity (with Rock breaker attachment)-2 Nos
Jack hammers 30-32mm dia.- 2 Nos
- x. Tractor mounted compressor (2 jack hammer capacity)- 1 Nos.
- xi. No trees are uprooted due to quarrying operation.
- xii. The existing road from the main road to quarry is in good condition and the same will be maintained and utilized for transport.
- xiii. There is No Export of the Rough stone.
- xiv. The lease area is about 1.50.0 Hectares which is bounded by four corners and the Co — boundaries are clearly marked in the drawing enclosed as Plate No III.
- xv. The diagram of proposed mining area showing the dimensions of the pit, its proposed Depth of mining, proposed area is enclosed as Plate No V.
- xvi. There is no wastages anticipated during this quarry operation and the top soil will be stacked along the boundary barrier and safety zones for afforestation purpose in the lease area.
- xvii. Around 12 employees are proposed to be deployed for quarrying operation.
- xviii. Environmental parameters,

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- 11
- i) The area does not attract the Forest Conservation Act, 1980 as there is no forest around 1 Km radius.
- ii) There is no interstate boundary around 10Kms radius.
- iii) There is no Protective Wild Life Sanctuary, Eco Sensitive Zone within 15 Kms radius of the proposed quarry area.

xix. TOTAL COST OF THE PROJECT:

A. Investment cost	=	Rs.	5,50,000/-
B. Mining cost	=	Rs.	44,64,760/-
Total Project Cost (A+B)	=	Rs.	50,14,760/-

xx. EMP Cost = Rs. 5,15,000/-

xxi. CER allocation = Rs. 5,00,000/-

1. GENERAL INFORMATION :

1.1	a)	Name of the applicant	Tmt.R.ChempakaDevi W/o. T.R.Varadarajan
	b)	Address of the applicant (with phone No. & e-mail)	Address : 1, Ramasamy Naicker Street, Vadugarkottai Aruppukottai Town Taluk : Aruppukottai District : Virudhunagar Pin Code : 626 101. Mobile No : 9364530969
	c)	Status of the applicant (Individual / Company / Firm)	Individual.
1.2	a)	Mineral which the applicant intends to mine	Rough Stone and Gravel.
	b)	Precise area communication letter details received from the Competent authority of the Government	District Collector, Virudhunagar letter No. Na.Ka.KV1/878/2018-Minerals dated 26.08.2022.
	c)	Period of permission / lease to be granted	Period of lease to be granted for 5 years as per Rule 19 and 20 of Tamil Nadu Minor Mineral Concession Rules -1959 .
	d)	Name and address of the RQP / Authorized person preparing the mining plan	Name : R. Gururamachandran, M.Sc., Address : No. 4/479A, Nandhikoil Theru, E.B.Colony, Puliankulam, Soolakkarai West, Virudhunagar - 626 003. Cell : 9443434288 / 9750309288. E-Mail : gruram@gmail.com Registration No : RQP/MAS/224/2010/A.

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2. LOCATION :

2.1 a) Details of the area with location map There are no villages within the radius of 500m. The area bounded by following villages within 5 kms circle.
- refer Plate-IA & Plate-II.

Table -1

DIREC-TION	VILLAGE	POPULATION	DIS-TANCE
North	Konkanakkurichi	600	2.0 Km
	Konraikulam	500	2.5 Km
South	Bommakottai	1800	2.5 Km
	Kalayarkarisalkulam	600	3.0 Km
East	Aladipatti	3000	1.5 Km
	Kalyanasundarapuram	600	1.5 Km
West	Kalloorani	2800	2.0 Km
	Mudduramalingapuram	1600	2.5 Km

i) District, Taluk and Village

District : Virudhunagar
Taluk : Aruppukottai
Village : Sundakkottai

ii) Survey Nos.

SF. Nos. : 44/1(P) (0.43.5 Hc.), 44/5(P) (0.34.5 Hc.), 44/6 (0.14.5 Hc.), 44/7(0.14.5Hc.) and 44/8 (0.43.0 Hc.).

iii) Total Extent in Ha.

1.50.0 Hectares (Ryotwari)

2.2 b) Classification of the area (Ryotwari/ Poramboke/ others)

Patta Lands (Ryotwari)

2.3 c) Ownership / Occupancy of the applied area (surface right)

As per village accounts, the land stands in the name of the applicant vide **Patta Nos. 577** of Sundakottai Revenue Village, Aruppukottai Taluk.
As such the applicant has got surface rights over the lands applied for the grant of quarry lease for Rough Stone and Gravel.

2.4 d) Topo sheet No. with latitude and longitude

Topo Sheet No. : 58 K/3.
Latitude Between : 09° 28' 21.10" to 09° 28' 25.30" N
Longitude Between : 78° 10' 57.95" to 78° 11' 02.30" E

B. Chempaka

13



2.5	e) Existence of public road / Railway line, if any nearby and approximate distance	<p>The project site is located 2.0 kms east of Kalloorani village which is located over State Highway No. 17 (Aruppukottai - Kamuthi - Parthipanoor) at a distance 9 kms from Aruppukottai town towards southeast. The panchayat road from Kalloorani village to Aladipatti village connects the quarry lease area. The existing road from the quarry area will be used and maintained for transportation and trees will be planted on either side of the road to prevent dust and noise to the nearby areas.</p> <p>The Nearest Railway station is Aruppukottai town on northwest at about 14 Kms distance. The airport is at Madurai at 45 Kms northwest and the sea port is at Thoothukudi at 85 kms southeast direction.</p>
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PART - A

3. GEOLOGY AND MINERAL RESERVES :

3.1	Brief description of the Topography and general Geology of the area (with plans)	<p>The area applied for quarry lease is plain terrain with gentle slope towards south and covered by brownish soil followed by weathered rock formation and massive Charnockite rock formation. The massive rock formation is noticed / occurred at an average depth of 6.0 mts from the surface i.e. below top soil and weathered rock formation.</p> <p>The top sandy brownish soil and weathered rock portion used for formation of Roads, filling the low lying areas, etc., The massive charnockite occur below the weathered zone is hard, medium to coarse grained with intrusions. The charnockite is played a vital role in construction and road formation civil works.</p> <p>Water table is found at a depth of 60m below ground level in this particular area. Average annual rainfall is about 935mm during SW and NE monsoons.</p>
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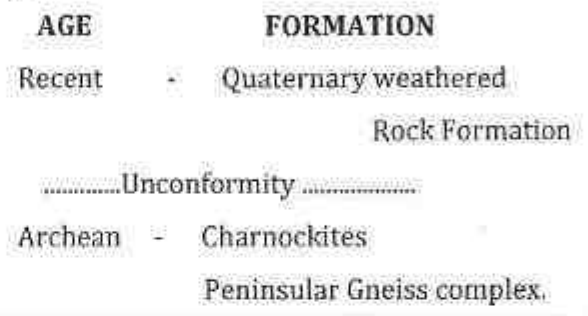
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14



Peninsular gneiss forms the oldest rock formations of Archean age, in which the massive formation of Charnockite lies over with rich accumulation of recent quaternary formation. On regional scale the Charnockite formations trends along NE-SW with a dip of 70° SE.

The general geological sequences of the rocks in this area are given below.




3.2	Details of exploration already carried out if any	No exploration was carried out. Massive Rough stone formation visible from the nearby existing pits in this area of quarries in operation and dry open wells.
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3.3	Estimation of reserves	
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a)	Geological reserves with geological sections on a scale of 1:1000 / 1:2000	<p>The practical method of the systematic geological mapping and delineation of Rough stone (Charnockite) within the field was done and careful evaluation of body luster, physical properties, engineering properties, commercial aspects etc.,.</p> <p>Totally two sections have been drawn, one section along Length wise as (A-A') and the other section drawn across the Width as (B-B') to cover the maximum area considered.</p> <p>The Topographical, Geological plan and sections demarcated the commercial marketable Rough stone (Charnockite) deposit has been prepared in 1:1000 scale and the estimated balance Geological Reserves as 5,58,600 CuM of Rough Stone and 95,760 CuM of Gravel for a total depth of 41.0 mts below ground level. Please refer the Geological plan and sections Plate No- IV.</p>
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15



Geological Resources (Plate No. IV)

The geological reserves have been calculated based on the cross section method and the availability of Geological Resources in this land is given below.

Table-1

SECTION	LENGTH (M)	WIDTH (M)	HEIGHT (M)	ROUGH STONE VOLUME M ³	TOP SOIL & GRAVEL VOLUME M ³
A-A' & B-B'	133	120	6.0	-	95,760
	133	120	35.0	5,58,600	-
TOTAL GEOLOGICAL RESERVES				5,58,600	95,760

Available Mineable Reserves (Plate No. VI):

The available mineable reserves are calculated for the proposed lease period of 5 years based on the total minable reserves calculated by deducting 10.0 m & 7.5m safety distances to the odai at south and patta land on the three sides respectively and Bench losses.

Table-2

SECTION	LENGTH (M)	WIDTH (M)	HEIGHT (M)	ROUGH STONE VOLUME (M ³)	TOP SOIL & GRAVEL VOLUME (M ³)
A-A' & B-B'	116	100	6.0	-	69,600
	101	85	5.0	42,925	-
	91	75	5.0	34,125	-
	81	65	5.0	26,325	-
	71	55	5.0	19,525	-
	61	45	5.0	13,725	-
	51	35	5.0	8,925	-
	41	25	5.0	8,125	-
TOTAL MINEABLE RESERVES				1,50,675	69,600

The available mineable reserves have been computed as 1,50,675 M³ of Rough Stone and 69,600 M³ of Top soil & Gravel up-to the depth of 41.0 meters from the ground level.

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4. MINING :

4.1	Method of mining (opencast / underground)	Open cast Semi-Mechanized Mining with one 6.0 meter bench for Top soil & Gravel followed by 5.0 meter vertical bench with a bench width not less than the bench height. However, as far as the quarrying of Rough stone is concerned, observance of the provisions of Regulation 106 (2) (b) as above is seldom possible due to various inherent petro genetic factors coupled with mining difficulties. Hence it is proposed to obtain relaxation to the provisions of the above regulation from the Director of Mines Safety for which necessary provision is available with the Regulation 106 (2) (b) of MMR-1961, under Mines Act - 1952.
4.2	Mode of working (mechanized, semi mechanized, manual)	The Rough Stone is proposed to quarry at 5m bench height & width with conventional Opencast Semi-Mechanized Method. The quarry operation involves shallow jack hammer drilling, slurry blasting, Loading and transportation of Rough stone and Gravel to the needy nearby crusher units / road formation works. The production of Rough stone in this quarry involves the following method which is typical for Rough Stone quarrying in contrast to other major mineral mining. Splitting of rock mass of considerable volume from the parent rock mass by jackhammer drilling and blasting, by manually braking and loading the Rough Stone from pithead to the needy crushing units/ civil works for the needy sectors.
4.3	Proposed bench height & width	Height 5.0m & Width 5.0m.
4.4	Indicate the overburden / mineral production expected pit wise as detailed below (composite plan and section showing pit	The overburden is in the form of top soil and weathered rock formation, it will be removed during the quarrying operation, the top soil preserved all along the boundary barrier for afforestation and remaining is salable. Hence there is no waste anticipated during the Rough stone quarry operation, The excavated rough stone will be

RC 16/67 ⊕ B. Chempaka Rao

17



layout, dumps, disposal of waste if any etc.) directly loaded into the tippers for selling purpose locally.


The Year wise and production Development plan and section indicating the Pit lay out, Green belt development are shown in Plate No-V and presented in the Table-3 as follows.

Year wise - Production Schedule - Table-3

SECTION	YEAR	LENGTH (M)	WIDTH (M)	HEIGHT (M)	ROUGH STONE VOLUME (M ³)	GRAVEL VOLUME (M ³)
A-A' & B-B'	I-Year	51	100	6.0	-	30,600
		36	85	5.0	15,300	-
		26	75	5.0	9,750	-
		16	65	5.0	5,200	-
I - YEAR PRODUCTION					30,250	30,600
A-A' & B-B'	II-Year	17	100	6.0	-	10,200
		17	85	5.0	7,225	-
		17	75	5.0	6,375	-
		17	65	5.0	5,525	-
		23	55	5.0	6,325	-
		13	45	5.0	2,925	-
II - YEAR PRODUCTION					28,375	10,200
A-A' & B-B'	III-Year	16	100	6.0	-	9,600
		16	85	5.0	6,800	-
		16	75	5.0	6,000	-
		16	65	5.0	5,200	-
		16	55	5.0	4,400	-
		16	45	5.0	3,600	-
		19	35	5.0	3,325	-
		9	25	5.0	1,125	-
III - YEAR PRODUCTION					30,450	9,600
A-A' & B-B'	IV-YEAR	16	100	6.0	-	9,600
		16	85	5.0	6,800	-
		16	75	5.0	6,000	-
		16	65	5.0	5,200	-
		16	55	5.0	4,400	-
		16	45	5.0	3,600	-
		16	35	5.0	2,800	-
		16	25	5.0	2,000	-
IV - YEAR PRODUCTION					30,800	9,600
A-A' & B-B'	V-YEAR	16	100	6.0	-	9,600
		16	85	5.0	6,800	-
		16	75	5.0	6,000	-
		16	65	5.0	5,200	-
		16	55	5.0	4,400	-
		16	45	5.0	3,600	-
		16	35	5.0	2,800	-
		16	25	5.0	2,000	-
V - YEAR PRODUCTION					30,800	9,600
TOTAL PRODUCTION FOR FIVE YEARS					1,50,675	69,000

16
 Rec 19/15
 B. Cheempaka
 119

18




Summary - Year wise Production :

YEAR	ROUGH STONE VOLUME (M ³)	GRAVEL VOLUME (M ³)
I	30,250	30,600
II	28,375	10,200
III	30,450	9,600
IV	30,800	9,600
V	30,800	9,600
TOTAL	1,50,675	69,600

The applicant has proposed to carry out 1,50,675 m³ of Rough Stone and 69,600 m³ of Top soil & Gravel production for the period of FIVE years up to a depth of 41m max from the ground level (Table-3).

4.5	Machineries to be used	
	a) For mining	Excavator of 0.90Cbm bucket capacity (with Rock breaker attachment) - 1 Nos. Jack hammers 30-32mm dia. - 1 sets. Tractor mounted compressor (2 jack hammer capacity) - 2Nos.
	b) Loading equipment	Excavator of 0.90Cbm bucket capacity (with bucket attachment) - 1 No.
	c) Transportation (includes within the mine and mine to destination)	Tipper 3 Nos. of 10/20 tons capacity (from quarry to needy peoples & local crushers).
4.6	Disposal of overburden / waste	The overburden is in the form of top soil and weathered rock formation. It will be quarried for filling purposes to nearby end users and part of soil will be preserved all along the boundary as barrier for afforestation.
4.7	Brief note on conceptual mining plan for the entire lease period base on the geological, mining and environmental considerations	Conceptual mining plan is prepared with an object of long term systematic development of benches, layouts, selection of permanent structures, depth of quarrying and ultimate pit dimensions, selection of sites for construction of infrastructure, etc., The ultimate pit size is designed based on certain practical parameters such as economical

17

Ric 18/18 

120

19



depth of mining, safety zones, permissible area, etc. The ultimate pit limit (dimension) at the end of five years mining lease period is given below:

Table-4

Description End of the lease period	Length (Max) (m)	Width (Max) (m)	Depth (Max) (m)
A-A' & B-B'	116	100	41

Afforestation has been proposed in the 10.0m & 7.5m safety barrier by planting Neem, Pungan, Vagal, Poovarsau and Savukku trees of native species. All the base line information studies like Air quality monitoring, Noise and vibration monitoring, Water analysis studies will be carried out as per the MOEF Norms.

Please refer plate No. V & VI.

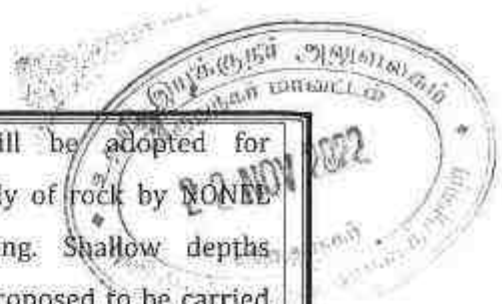
5. BLASTING :

5.1	Blasting pattern	<p>The quarrying operation will be carried out in conjunction with conventional method of mining using Jack hammer drilling and blasting for shattering effect and loosen the Rough stone.</p> <p>Drilling and Blasting :</p> <p>Drilling and blasting parameters are as follows</p> <p>Depth of Each hole : 1.2m-1.5m</p> <p>Diameter of hole : 30-32mm</p> <p>Spacing between holes : 0.5m</p> <p>Burden per hole : 0.5m</p> <p>Pattern of hole : Zigzag</p> <p>Inclination of holes : 80°from horizontal</p> <p>Use of delay detonators : 25 milli-second delays</p> <p>Detonating fuse : "Detonating" Cord</p> <p>Hole pattern : Staggered in 2 to 3 rows</p>
5.2	Type of explosives to be used	<p>Small Dia. 25mm Slurry explosives are proposed to be used for shattering and heaving effect for removal and winning of Rough stone. No deep hole drilling or primary blasting is proposed.</p>

18
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121

20



5.3	Measures proposed to minimize ground vibration due to blasting	<p>Controlled blasting measures will be adopted for minimizing ground vibration and fly of rock by NONEE initiation based controlled blasting. Shallow depths jackhammer drilling & blasting is proposed to be carried out with minimum use of explosive mainly to give shattering effect in rough stone for easy excavation and to control fly of rock.</p> <p>No of Holes = 32Holes Yield = 96Tons Powder factor = 6 tons/Kg of explosives Total explosive required = 16Kg- Slurry explosives Charge/ hole = 0.5 Kg Blasted at day time = 4.30 to 5.30 P.M (or whenever required)</p>
5.4	Storage and safety measures to be taken while blasting	<p>The lessee will engage an authorized explosive agency to carry out the small amount of blasting and it will be supervised by competent and statutory Foreman/Permit Mines Manager.</p>

6. MINE DRAINAGE :

6.1	Depth of water table (based on nearby wells and water bodies)	<p>The water table is below 60 mts from ground level which is observed from the nearby bore wells and the data obtained from existing panchayat and Private borewells. The quarry operation is proposed up to a depth of 41.0mts below the ground level.</p>
6.2	Arrangements and places where the mine water is finally proposed to be discharged	<p>The water encountered during quarrying inside the pit due to rain water and seepage, will be pumped out by 5HP water pumps to the Green belt development areas and excess water to the down side village odai for use of agricultural purposes. Also the water will be used for dust suppression on haul roads during Haulage of machineries.</p>

19 *L. Chempaka Rao*

RC 20/68

20



7. OTHER PERMANENT STRUCTURES (also shown in the map) :

7.1	Habitations / village natham	There are no habitations within the Radius of 300m. The nearby village habitations are tabulated in Table - 5 as below.
7.2	Power lines (HT/ LT)	There are no Electric Power line within 50 mts distance from the lease area.
7.3	Water bodies (river, pond, lake, odai, canal etc.)	The nearest water body is the odai south of the area, for which 10m safety distance will be maintained as per the conditions, a Kanamoi in Konganakurichi village area at 350 mts north and Sundakottai kanmoi is at 560 mts south distance. There are no other major water bodies like river, lake, etc., within 50m radial distance.
7.4	Archaeological / historical monuments	There are no Archaeological / historical monuments within 500m radial distance from the area.
7.5	Road (NH, SH others)	<ul style="list-style-type: none"> • State Highway (SH-47) Aruppukottai Town - Kamuthi - Parthibanoor at 2.0 Km west. • State Highway (SH-42) Aruppukottai - Tiruchuli - Parthibanoor at 4.0 km north. • National Highway NH-38 Madurai City - Thoothukudi Harbor is at 9.0 Kms west.
7.6	Places of worship	There are no place of worships within the Radius of 500m.
7.7	Reserved forest / forest / social forest / wild life sanctuary etc.	There are no Reserved forest / forest / social forest / wild life sanctuary etc. within 15 Kms radius of the area.

Table-5

SL. NO	DIRECTION	VILLAGE	POPULATION	DISTANCE
1	North	Konkanakkurichi Konraikulam	600 500	2.0 Km 2.5 Km
2	South	Bommakottai Kalayarkarisalkulam	1800 600	2.5 Km 3.0 Km
3	East	Aladipatti Kalyanasundarapuram	3000 600	1.5 Km 1.5 Km
4	West	Kalloorani Mudduramalingapuram	2800 1600	2.5 Km 2.5 Km

RC 21/68 ²⁰ B. Cheepata (S)

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22 NOV 2022

Table-6

Nearest Infrastructures :

Sl. No	Name of infrastructure	Name of the place	Distance from area applied for M.L.
1	Post office	Aladipatti B.O Pin:626 129	1.5 Km
2	Police station	M.Reddiyapatti	7.0 Km
3	Town	Aruppukottai	15.0 Km
4	Panchayat	Bommakottai	2.0 Km
5	Union	Tiruchuli/ M.Reddiyapatti	7.0 Km
6	DSP office	Tiruchuli	8.0 Km
7	Hospital	Kalloorani	3.0 Km
8	School	Mudduramalingapuram	2.5 Km
9	Railway station	Aruppukottai	9.0 Km
10	Airport	Madurai	45 Km
11	Sea Port	Thoothukudi	85 Km

8. EMPLOYMENT POTENTIAL & WELFARE MEASURES :

8.1	Employment potential (skilled, semi skilled, unskilled)	<p>a. Skilled labour Mine Foreman/ Permit Mines Manager : 1 Jack hammer operator : 2 Blaster/ mate : 1</p> <p>b. Unskilled- helper : 6</p> <p>Total 10</p> <p>The above manpower is adequate to meet out the production schedule and the machinery strength envisaged in the mining plan and to comply with the statutory provisions of the Mines Safety Regulations. It is been ensured that no labour employed less than 21 years (child labours) or entertained for any kind of quarrying operations. All the labours engaged for quarrying operations will be insured during the quarry lease period.</p>
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233



B-2	Welfare measures									
	a) Drinking water/other water requirements	<table border="1"> <tr> <td>Requirement</td> <td>Drinking & Domestic water - 1.0 KLD</td> </tr> <tr> <td>will be arranged from nearby sources every day.</td> <td>Dust suppression sprinkling - 2.5 KLD</td> </tr> <tr> <td></td> <td>Afforestation for trees - 2.5 KLD</td> </tr> <tr> <td></td> <td>TOTAL WATER REQUIRED - 6.0 KLD</td> </tr> </table>	Requirement	Drinking & Domestic water - 1.0 KLD	will be arranged from nearby sources every day.	Dust suppression sprinkling - 2.5 KLD		Afforestation for trees - 2.5 KLD		TOTAL WATER REQUIRED - 6.0 KLD
Requirement	Drinking & Domestic water - 1.0 KLD									
will be arranged from nearby sources every day.	Dust suppression sprinkling - 2.5 KLD									
	Afforestation for trees - 2.5 KLD									
	TOTAL WATER REQUIRED - 6.0 KLD									
	b) Sanitary facilities	Sanitary facilities will be constructed with in the quarry lease area as permanent structure and it will be maintained periodically.								
	c) First Aid facility	First aid kits will be kept in Mines office room, in case of such eventualities, the victim will be given first aid immediately at the site and injured person will be taken to the hospital. Hospitals are available at distance of 2.0 Kms in Kalloorani PHC. The competent and Statutory Foreman/ Permit Manager will be in charge of first aid.								
	d) Labor Health	Periodically medical checkup related to occupational health safety will be conducted to all the workers.								
	e) Precautionary safety measures to the laborers	All the quarry workers will be provided with safety equipments like helmets, Mine Goggles, Ear plugs, Ear muffs, Dust mask, reflector jackets and Safety Shoes as personal protective device as per the specification approved by Director of Mines Safety. Periodically medical checkup will be conducted for all workers for any mine health related problems. Proper training and induction will be given by qualified and experienced safety officer to all employees about the safe and systematic Rough stone quarrying operations. The drillers and workers will be sent for vocational training periodically to carry out the quarrying operations scientifically to safe guard the men machinery and mineral and to create awareness of conventional opencast quarrying operations.								

RC 23/68²² R. Chempaka

(24)

PART — B

9. ENVIRONMENT MANAGEMENT PLAN :

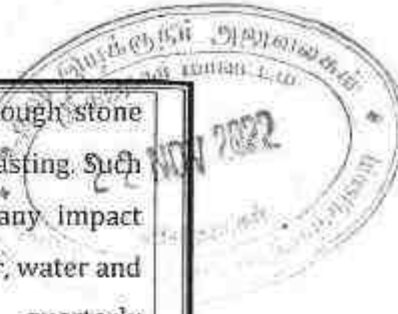
9.1	Existing land use pattern	<p>The lease area is plain terrain with very gently sloping towards south. There are agricultural activities of dry crops with in 1000 m radius and the proposed lease area is dry barren lands and weathered rock portions exposures are noticed here and there. Because of rocky exposures and hard surface the area is mostly dry and barren.</p> <p>Land use pattern within 1.0 Km radius is follows:</p> <ol style="list-style-type: none"> 1. Proposed & present Quarry Area - 16% 2. Crusher / M.Sand units - 3% 3. Village site, Roads & cart tracks - 4% 4. Green Belt & Fairly dense scrubs - 5% 5. Water bodies odai,urani& Kanmoi - 12% 6. Dry Lands - 35% 7. Seasonal Agricultural lands - 25% <p>There are abandoned, working & certain proposed stone quarries within 500 mts radius.</p> <p>The land use pattern within the proposed lease area in the beginning of the lease period:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td>Mining / Excavation at present</td> <td style="text-align: right;">- 0.00.00 Hectares</td> </tr> <tr> <td>Storage of top soil& gravel</td> <td style="text-align: right;">- 0.00.00 "</td> </tr> <tr> <td>Stocking & Mineral Dressing Yard</td> <td style="text-align: right;">- 0.00.00 "</td> </tr> <tr> <td>Infrastructure</td> <td style="text-align: right;">- 0.01.00 "</td> </tr> <tr> <td>Mine Road</td> <td style="text-align: right;">- 0.02.00 "</td> </tr> <tr> <td>Afforestation & Mine safety</td> <td style="text-align: right;">- 0.60.50 "</td> </tr> <tr> <td>Future Mining</td> <td style="text-align: right;">- 0.86.50 "</td> </tr> <tr> <td>Undisturbed area</td> <td style="text-align: right;">- 0.00.00 "</td> </tr> <tr> <td style="text-align: right;">Total</td> <td style="text-align: right;">1.50.00 "</td> </tr> </table> <p>Details furnished in the Plate Nos. VIIA, VIIB, VIII.</p>	Mining / Excavation at present	- 0.00.00 Hectares	Storage of top soil& gravel	- 0.00.00 "	Stocking & Mineral Dressing Yard	- 0.00.00 "	Infrastructure	- 0.01.00 "	Mine Road	- 0.02.00 "	Afforestation & Mine safety	- 0.60.50 "	Future Mining	- 0.86.50 "	Undisturbed area	- 0.00.00 "	Total	1.50.00 "
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Undisturbed area	- 0.00.00 "																			
Total	1.50.00 "																			

RC 24/68

9.2	Water regime	Ground water table in this area is below 60 mts from ground level. The quarrying is up to a maximum depth of 41m below the ground level. Hence the quarry operation will not be affected by the ground water. There are few agricultural wells within 1 km radius of the project area. During monsoon and rainy seasons the water level is at 8mts BGL and during summer it becomes dry.
9.3	Flora and fauna	Except acaçia bushes, no other valuable trees are noticed in the applied area. Further, neither flora of botanical interest nor fauna of zoological interest is noticed in this area.
9.4	Climatic conditions	The area receives annual rainfall of about 935mm and the rainy season is mainly from Oct. - Dec. during North East monsoon. The summer is hot with maximum temperature of 42°C and winter encounters a minimum temperature of 23°C.
9.5	Human settlement	There are few villages located in this area within 5km radius, the approximate distance and population are given in Table - 5 as above. Basic human welfare Amenities such as Health Center, Schools, Communication Facilities, and Commercial Centers etc are available at Aruppukottai town located at a distance of 9.0 kms northwest.
9.6	Plan for air, dust suppression	The Air quality will be affected during the quarrying period due to blasting and jack hammer drilling, which will be within prescribed limits. Mist Water spraying will be carried out to suppress the dust in day time often as and when required.
9.7	Plan for noise level control	Shallow holes of 32mm diameter and 1.5 feet depth will be drilled and conventional low power explosives such as Slurry Explosives, ordinary safety fuse only will be used for rough stone. Hence, ground vibration and noise pollution will be minimal and restricted within the quarry workings. Noise level monitoring and other Mitigation measures will be carried out to reduce Noise and Vibration.

RC 25/68 ²⁴ 

96



9.8	Environmental impact assessment statement describing impact of mining on the next five years	The mining plan is for a small production of Rough stone without involving deep hole drilling and heavy blasting. Such limited mining activity is not likely to cause any impact adversely on environment as far as pollution of air, water and noise is concerned. Anyhow periodical quarterly environmental impact studies will be conducted as per EIA notification issued by MOEF.																																				
9.9	Proposal for waste management	The Air quality will be affected during the quarrying period due to blasting and jack hammer drilling, which will be controlled by spraying Mist Water to suppress dust.																																				
9.10	Proposal for reclamation of land affected during mining activities and at the end of mining (refilling / fencing etc.)	The project proposed area will be fenced with stone pillars with 3mts interval and covered barbed wires with only one entry point for transport. There is no refilling is planned since all the quarried rough stone and gravel is salable and the pit after quarry completion will be filled with rain water from the nearby sources which will act as recharge body for ground water for the influence of the surrounding agricultural wells for agricultural purposes.																																				
9.11	Programme of afforestation (indicate extend, number, name of species to be afforested)	<p>The 7.5m safety distance along the lease boundary has been identified to be utilized for afforestation. Appropriate native species of Neem trees will be planted in a phased manner as described below.</p> <p style="text-align: center;">Table - 6</p> <table border="1"> <thead> <tr> <th>Year</th> <th>No. of tress proposed to be planted</th> <th>Survival rate %</th> <th>Area to be covered Sq.m</th> <th>Name of the species</th> <th>No. of trees expected to be grown</th> </tr> </thead> <tbody> <tr> <td>I</td> <td>150</td> <td>80%</td> <td>1210</td> <td>Neem</td> <td>120</td> </tr> <tr> <td>II</td> <td>150</td> <td>80%</td> <td>1210</td> <td>Pungan</td> <td>120</td> </tr> <tr> <td>III</td> <td>150</td> <td>80%</td> <td>1210</td> <td>Vagai</td> <td>120</td> </tr> <tr> <td>IV</td> <td>150</td> <td>80%</td> <td>1210</td> <td>Poovarsu</td> <td>120</td> </tr> <tr> <td>V</td> <td>150</td> <td>80%</td> <td>1210</td> <td>Savukku</td> <td>120</td> </tr> </tbody> </table>	Year	No. of tress proposed to be planted	Survival rate %	Area to be covered Sq.m	Name of the species	No. of trees expected to be grown	I	150	80%	1210	Neem	120	II	150	80%	1210	Pungan	120	III	150	80%	1210	Vagai	120	IV	150	80%	1210	Poovarsu	120	V	150	80%	1210	Savukku	120
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V	150	80%	1210	Savukku	120																																	
9.12	Proposed financial estimate / budget for (EMP) environment management:																																					

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I. Project cost :

(a). Investment cost :

S. No	DETAILS	COST in Rs. /-
i)	Lease rent / Land Cost	3,00,000
ii)	Machinery to be used	Hired machinery
iii)	Fencing	1,50,000
iv)	Worker's Shed	40,000
v)	Sanitary facility	30,000
vi)	Other Items	30,000
TOTAL		5,50,000

(b). Expenditure/ Production Cost. (1Unit= 2.83m³)

Drilling and Blasting cost / unit production = Rs.70/-
including loading & breaking.

i). Mining cost for rough stone up to 5 Years planned production quantity

Total Movable quantity in M³ - 1,50,675 M³ (53,242 Units)

Total cost of mining Rough Stone = 53,242 X Rs. 70/-

= Rs. 37,26,940/-

ii). Mining cost for gravel & weathered rock for 5 Years planned production quantity

Total Movable quantity in M³ - 69,600 M³ (24,594 Units)

Total cost of mining - Gravel = 24594 X Rs. 30/-

= Rs. 7,37,820/-

Total Cost for Mining - Rs. 44,64,760/-

Total Project Cost (a+b) = Rs. 50,14,760/-.

II. EMP Cost :

Sl. No.	DETAILS	COST per MONTH (Rs.)	Total Cost per Year (Rs.)	TOTAL COST for 5 years LEASE PERIOD (Rs.)
i)	Drinking Water facility for 16 Laborers from water vendors	1,000	12,000	60,000
ii)	Sanitary maintenance for Rest rooms	1,000	12,000	60,000
iii)	Safety kits(mask, helmet, sanitizer, gloves, etc.,)	500	6,000	30,000
iv)	Water Sprinkling using own tractor for the area	1,500	18,000	90,000
v)	Afforestation, Plantation & Maintenance	10,000 (annual)	10,000	75,000
vi)	Environmental parameters testing expenses fees for every six months a. Air Monitoring b. Water analysis c. Noise Monitoring d. Soil Testing	20,000 (bi-annual)	40,000	2,00,000
TOTAL				5,15,000

28



III. CER cost @2% on Project cost (a+b) - Rs. 1,00,000/-

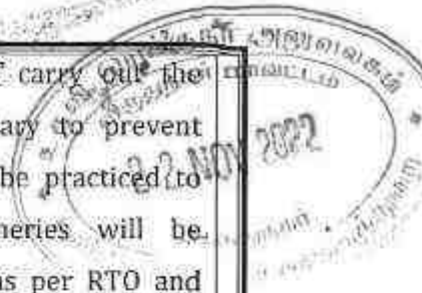
CER Activity	CER allocation (Rs)
Carrying out provisions for Drinking Water with dispenser and Toilet /sanitary repair especially for girls students in Govt. Higher Secondary School, Muthuramalingapuram Bommakottai Panchayat, Aruppukottai Taluk.	5,00,000/-
Total cost Allocation	5,00,000/-

10. MINE CLOSURE PLAN :

10.1	Steps proposed for phased restoration, reclamation of already mined out areas	There is no proposal for back filling, reclamation and rehabilitation. The quarried pits after the end of the life of lease will be fenced to prevent inherent entry of public and cattle's and will be used for Rain Water harvesting.
10.2	Measures to be under taken on mine closure as per Act & Rules	Measure will be taken as per Act & Rules, there is no proposal for back filling, reclamation and rehabilitation. The quarry pit will be fenced by barbed wire to prevent inherent entry of public and cattle. The quarried out pit will be allowed to collect rain water which will act as a reservoir for storage and recharge pit for ground water which will enhance the static water level of nearby wells.
10.3	MITIGATION MEASURE TO BE UNDERTAKEN FOR SAFETY AND RESTORATION / RECLAMATION OF THE ALREADY MINED OUT AREA.	
	AIR QUALITY: Air quality will be degrade due to the drilling, blasting, mining operation and transportation.	Mitigation measures: Drilling will be carried out by wet drilling mode to control the dust propagation into the air. Controlled Blasting will be carried out on limited scale. Mist Water spraying on haul road is proposed to prevent the dust propagation into the air.

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29



<p>NOISE AND VIBRATION: The noise will be formed due to the drilling, blasting, loading and movement of Machineries.</p>	<p>The applicant has proposed to carry out the plantation all along the boundary to prevent Noise besides wet drilling will be practiced to prevent dust. All the machineries will be maintained in good conditions as per RTO and TNPCB Norms to prevent Noise, Smoke and vibration to maintain noise levels below 80dB.</p>
<p>WATER REGIME:</p>	<p>The quarry operation (41.0m depth below Ground level) is well above the water table (below 60 mts from ground level), hence the water table will not be affected in any manner. The seepage and rain water will be drained out from the pit by 5H.P motor pump and will be discharged through filter media to boundary barrier for afforestation and excess water will be sprayed on haul roads to prevent dust propagation in to the atmosphere. The rough stone quarry will not produce any harmful toxic effluence in the form of solid, liquid or gas.</p>
<p>HUMAN HEALTH & SAFETY: Dust will be limited due to the mine operation.</p>	<p>All the laborers will be provided with safety equipment's like helmet, Safety Goggles, Ear muff, Hand gloves, safety jacket, safety belt, and Mine boots etc., at applicant's cost, as per the specifications of Director of mines safety. The competent qualified person foreman/Permit Mines Manager will provide first aid and will take care of small & minor injuries. If any accident happens, the victim will be taken to the nearby hospital by the applicants van which is always kept in the mines office. Hospitals are available at distance of 2.0 Kms in Kalloorani Govt. PHC and at 9 kms in Aruppukottai Govt. Hospital & Private hospitals.</p>

RC 29/68

28

R. Cheempala

30



11. ANY OTHER DETAILS INTEND TO FURNISH BY THE APPLICANT:

- ❖ This mining plan for Rough stone (Charnockite) quarry is prepared as per the Minor Mineral Conservation and Development Rules, 2010 and amendments in the Tamil Nadu Minor Mineral Concession Rules, 1959.
- ❖ The provisions of the Mines Act, Rules and Regulations and orders made there under shall be complied with, so that the safety of the mine, machinery and person will be well protected.
- ❖ Permission, relaxation or exemption wherever required for the safe and scientific quarrying of the deposit will be obtained from the Department of Mines Safety.
- ❖ Any violation pointed out by the inspecting authorities shall be rectified as per the guidelines of the Department.

Place : Virudhunagar
Date :

R. Gururamachandran
 RQP SIGNATURE
 R. GURURAMACHANDRAN, M.Sc.,
 Qualified Person
 (RQP/MAS/224/2010/A)

[Signature]
 ASSISTANT DIRECTOR
 GEOLOGY AND MINING
 VIRUDHUNAGAR DISTRICT
 VIRUDHUNAGAR

22-11/2022

RC 30/68 ²⁹ B. Chempaka Devi

31



Mining Plan: Tmt.R.ChempakaDevi Rough Stone & Gravel Quarry.

ANNEXURE	I
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Precise Area Communication Letter

RC 31/68 ⊕ B. Chempaka ⊕

39

புவியியல் மற்றும் சுரங்கத்துறை

ந.க.எண்: கேவி1/878/2018-கனிமம்,

உதவி இயக்குநர் அலுவலகம்,
மாவட்ட ஆட்சியர் அலுவலக வளாகம்,
விருதுநகர்.

நாள்: 26.08.2022.



குறிப்பாணை

பொருள்: கனிமங்களும் குவாரிகளும் - விருதுநகர் மாவட்டம் - அருப்புக்கோட்டை வட்டம் - சுண்டக்கோட்டை கிராமம் - பட்டா புல எண்கள்: 44/1 (P) (0.43.50), 44/5(P) (0.34.5), 44/6 (0.14.5), 44/7 (0.14.5) & 44/8 (0.43.0) மொத்தம் 1.50.00 ஹெக்டேர் - ஐந்து வருடங்களுக்கு உடைகல் மற்றும் கிராவல் குவாரி உரிமம் வழங்கல் - சரியான பரப்பு (Precise Area) தேர்வு செய்யப்பட்டது - சுரங்கத்திட்டம் மற்றும் மாநில அளவிலான சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் இசைவினைப் பெற்று சமர்ப்பிக்க கோருவது - தொடர்பாக.

- பார்வை:**
1. திருமதி.R.செண்பகாதேவி, க/பெ.T.R.வாதராஜன், வடுகர் கோட்டை, அருப்புக்கோட்டை வட்டம், விருதுநகர், விண்ணப்பம் நாள்: 19.11.2018, 16.05.2019 மற்றும் 22.08.2022.
 2. இவ்வலுவலக கடிதம் எண் ந.க.கேவி1/878/2018, நாள்: 19.11.2018
 3. அருப்புக்கோட்டை, வருவாய் கோட்டாட்சியர் கடித எண் ந.க.அ2/7694/2018, நாள்: 06.05.2019.
 4. உதவி இயக்குநர், புவியியல் மற்றும் சுரங்கத்துறை அவர்களின் புலத்தணிக்கை அறிக்கை நாள்: 23.08.2022
 5. 1959 -ம் வருடத்திய தமிழ்நாடு சிறுகனிம சலுகை விதிகள் 41 மற்றும் 42.
 6. அரசாணை எண்.169 தொழில் (எம்.எம்.சி.1) துறை, நாள்: 04.08.2020.
 7. அரசாணை எண்.208, தொழில் (எம்.எம்.சி.1) துறை, நாள்: 21.09.2020.
 8. தொடர்புடைய ஆவணங்கள்.

விருதுநகர் மாவட்டம், அருப்புக்கோட்டை வட்டம், சுண்டக்கோட்டை கிராமம், பட்டா புல எண்கள்: 44/1 (0.82.0), 44/5 (0.39.5), 44/6 (0.14.5), 44/7 (0.14.5) & 44/8 (0.43.0) மொத்தம் 1.93.50 ஹெக்டேர் பரப்பில் 5 வருடங்களுக்கு உடைகல் மற்றும் கிராவல் குவாரி குத்தகை உரிமம் வழங்கக்கோரி விருதுநகர் மாவட்டம்,

RC 32/65 @ K. Chempaka Devi

அருப்புக்கோட்டை வட்டம், வடுகர் கோட்டை, கதவு எண்.1 என்ற முகவரியில் வசித்து வரும் திருமதி.R.செண்பகாதேவி, க/பெ.T.R.வரதராஜன் என்பவர் பார்வை 1-ல் காணும் விண்ணப்பத்தினை சமர்ப்பித்துள்ளார்.

அருப்புக்கோட்டை, வருவாய் கோட்டாட்சியர் மற்றும் புலியியல் மற்றும் சுரங்கத்துறை, உதவி இயக்குநர் ஆகியோர் கீழ்க்காணும் நிபந்தனைகளுக்குட்பட்டு மேற்கண்ட புலங்களில் உடைகல் மற்றும் கிராவல் குவாரி குத்தகை உரிமம் ஐந்தாண்டுகளுக்கு வழங்க பரிந்துரை செய்துள்ளனர்.

- 1) அருகிலுள்ள பட்டா நிலங்களுக்கு 7.5 மீ பாதுகாப்பு இடைவெளி விடுத்து குவாரி செய்தல் வேண்டும்.
- 2) புலத்தின் தெற்கில் புல எண் 43-ல் செல்லும் ஓடை மற்றும் புறம்போக்கு நிலங்களுக்கு 10 மீட்டர் பாதுகாப்பு இடைவெளி விடுத்து குவாரி செய்தல் வேண்டும்.
- 3) பொதுமக்கள் / விவசாய நிலங்களுக்கு பாதிப்பு ஏற்படாத வகையில் தகுதி வாய்ந்த அங்கீகரிக்கப்பட்ட நபர்கள் மூலம் வெடிமருந்துகள் சேமிக்கப்பட்டு குவாரியில் வெடித்தல் வேண்டும். குவாரியில் குறைந்த சக்தி கொண்ட வெடி மருந்துகளை பயன்படுத்தல் வேண்டும்.
- 4) சுரங்கத்திட்டம் மற்றும் சுற்றுச்சூழல் தடையில்லாச் சான்று குத்தகை உரிமம் வழங்குவதற்கு முன் சமர்ப்பிக்க வேண்டும்.
- 5) குவாரியில் வேலை செய்யும் தொழிலாளர்கள் தொழிலாளர் நலவாரியம் மற்றும் காப்பீடு திட்டத்தில் பதிவு செய்து தொழிலாளர் நலன் பேண்பட வேண்டும்.
- 6) குழந்தை தொழிலாளர்களை குவாரி பணியில் அமர்த்தக் கூடாது.
- 7) கனிமங்களை வாகனங்களில் கொண்டு செல்லும் போது பாதுகாபிகள், பொது மக்கள் மற்றும் பிற வாகனங்கள் பாதிக்காதவண்ணம் தார்பாய்கள் கொண்டு மூடி எடுத்துச் செல்ல வேண்டும்.

எனவே, துறை அலுவலர்களின் பரிந்துரையினை ஏற்றும் நிபந்தனைகளுக்கு உட்பட்டும், விருதுநகர் மாவட்டம், அருப்புக்கோட்டை வட்டம், சுண்டக்கோட்டை கிராமம், பட்டா புல எண்கள்: 44/1 (P) (0.43.50), 44/5(P) (0.34.5), 44/6 (0.14.5), 44/7 (0.14.5) & 44/8 (0.43.0) மொத்தம் 1.50.00 ஹெக்டேர் நிலம் 1959 -ம் வருடத்திய தமிழ்நாடு சிறுகனிம சலுகை விதிகள் விதி எண்: 19 (1) மற்றும் 20 -ன் படி ஐந்து வருடகாலத்திற்கு உடைகல் மற்றும் கிராவல் குவாரி உரிமம் வழங்க தகுதி வாய்ந்த நிலப்பரப்பாக (Precise Area) கருதப்படுகிறது.

RC 33/5 X V. Chempaka

34



தமிழ்நாடு சிறுகனிம சலுகை விதிகள்-1959 விதி எண்: 41 -ன்படி குவாரி பணி மேற்கொள்வது தொடர்பாக வரையு சுரங்கத் திட்டத்தினை (Mining Plan) 90 தினங்களுக்குள் சமர்ப்பிக்குமாறும், விதி எண்:42-ன்படி மாநில அளவிலான சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் (State Level Environmental Impact Assessment Authority) இசைவினைப் பெற்று சமர்ப்பிக்குமாறும் மனுதாரர் திருமதி.R.செண்பகாதேவி கேட்டுக் கொள்ளப்படுகிறார்.

[Handwritten Signature]
உதவி இயக்குநர்,
புவியியல் மற்றும் சுரங்கத்துறை,
விருதுநகர்

பெறுநர்
திருமதி.R.செண்பகாதேவி,
க/பெ.T.R.வரதராஜன்,
கதவு எண்.1,
வடுகர் கோட்டை,
அருப்புக்கோட்டை வட்டம்,
விருதுநகர் மாவட்டம்.

[Handwritten Signature]
26/11/2022

நகல்
உறுப்பினர் செயலர்,
மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையம் (SEIAA),
சென்னை.

⊗ *[Handwritten Signature]* V. Cheyapala

RC 31/68

35



Mining Plan: Tmt.R.ChempakaDevi Rough Stone & Gravel Quarry:

ANNEXURE II

Assistant Director-Geology & Mining,
Virudhunagar, Inspection Report

⊗ R. Chempaka Devi

RC 35/68

36

இட ஆய்வறிக்கை
(நாள்: 23.08.2022.)



விருதுநகர் மாவட்டம், அருப்புக்கோட்டை வட்டம், வடுகர் கோட்டை, ததுவ எண்.1 என்ற முகவரியில் வசித்து வரும் திருமதி.R.செண்பகாதேவி, க/பெ.T.R.வரதராஜன் என்பவர் விருதுநகர் மாவட்டம், அருப்புக்கோட்டை வட்டம், சுண்டக்கோட்டை கிராமம், பட்டா புல எண்கள்: 44/1 (0.82.0), 44/5 (0.39.5), 44/6 (0.14.5), 44/7 (0.14.5), 44/8 (0.43.0), 49/9 (0.14.00) & 49/10 (0.05.5) மொத்தம் 2.13.00 ஹெக்டேரில் ஐந்து வருட காலத்திற்கு உடைகல் மற்றும் கிராவல் குவாரி குத்தகை உரிமம் வேண்டி 1959-ம் வருடத்திய தமிழ்நாடு சிறுகனிம சலுகை விதிகள் விதி எண்.19 (1)-ன் படி விண்ணப்பம் செய்திருந்தார். விண்ணப்ப புலங்கள் 23.08.2022 தினத்தன்று ஆய்வு செய்யப்பட்டது.

இந்நிலையில் விண்ணப்பதாரரின் 16.05.2019 தேதியிட்ட கடிதத்தில் புல எண்கள். 49/9 (0.14.00 ஹெக்ட) & 49/10 (0.05.5 ஹெக்ட)-ன் கிழக்கு மற்றும் தெற்கில் முறையே அரசு புறம்போக்கு மற்றும் ஓடை அமையப்பெற்றுள்ளமையால், இவ்விரு புலங்களை நீக்கி இதர புலங்களில் உரிமம் வழங்க கேட்டுள்ளார்.

22.08.2022 கடிதத்தில் புல எண்கள்: 44/1 மற்றும் 44/5-ன் வடக்கு பகுதியில் கிரசர் யூனிட் அமையப்பெற்றுள்ளமையால் இவ்விரு புலங்களின் பரப்பினை குறைத்து புல எண்:44/1 (பு) (0.43.50 ஹெக்ட.), 44/5 (பு) (0.34.50 ஹெக்ட.)-ல் உரிமம் வழங்க கேட்டுள்ளார்.

விண்ணப்பிக்கப்பட்டுள்ள புல எண்கள்: 44/1 (P) (0.43.50), 44/5(P) (0.34.5), 44/6 (0.14.5), 44/7 (0.14.5) & 44/8 (0.43.0) மொத்தம் 1.50.00 ஹெக்டேர் நிலங்கள் பட்டா எண்:577 -ன் படி திருமதி.R.செண்பகாதேவி, க/பெ.T.R.வரதராஜன் என்பவர் பெயரில் சுண்டக்கோட்டை கிராம ஆயுதங்களில் பதிவாகியுள்ளது. இவ்வாறாக மேற்கண்ட புலங்களுக்கு விண்ணப்பதாரர் முழு உரிமையுடையவராகிறார்.

விண்ணப்பிக்கப்பட்ட புலங்கள் புஞ்சை வகைப்பாடுடைய தூசு நிலங்களாகும். புலங்களின் மேற்பரப்பு குண்டும், குழியுமாக விவசாய பணிகள் ஏதுமின்றி உள்ளது. புலங்களின் மேற்பரப்பில் காணப்படும் மண் மற்றும் சிதைந்த பாறைகளை (Weathered Rock), தொடர்ந்து சார்னகைட் (Charnockite) எனப்படும் கடின பாறைகள் (Hard rock) உள்ளது. கடின பாறைகளில் காணப்படும் வேறுபட்ட நிறங்கள் (Different in colours), இணைப்புகள் (Joints), பிளவுகள், கீரல்கள் (Cracks) வெடிப்புகள் மற்றும் மாறுபட்ட அளவு கொண்ட கனிமங்கள் காரணமாக

(X) R. Chalapathy

RC 36/68

37

இப்பாறைகளில் மெருகேற்றக் கூடிய வண்ண கற்களை (Polished Granite / Blocks) உற்பத்தி செய்ய இயலாது. இவ்வகை பாறைகளில் இருந்து கட்டிடப்பணிகள் மற்றும் சாலை / இரயில்வே பணிகளுக்கு தேவைப்படும் கற்கள், ஐல்லிகள் மற்றும் எம்-சாண்ட் ஆகியவற்றை உற்பத்தி செய்ய இயலும்.

விண்ணப்பிக்கப்பட்ட புலங்களை சுற்றிலும் 300 மீட்டர் சுற்றளவில் குடியிருப்புகள், பள்ளிகள், கோயில்கள், மசூதிகள், சடுகாடு ஏதும் இல்லை. 50 மீட்டர் சுற்றளவில் தேசிய / மாநில நெடுஞ்சாலைகள், ஆறுகள், கட்டிடங்கள், உயர் / தாழ்வழுத்த மின்கம்பிகள் இல்லை. உயர்வகை மரங்கள் ஏதுவும் இல்லை. 500 மீட்டர் சுற்றளவில் அருங்காட்சியக துறையினரால் பாதுகாக்கப்பட்ட பகுதியாக அறிவிக்கப்பட்ட இடங்கள் இல்லை. 1 கி.மீட்டர் சுற்றளவில் வனப்பகுதிகள் இல்லை. புலங்களுக்கு சென்று வர பாதை வசதி உள்ளது. புலங்கள் அனைத்தும் ஒன்றுக்கொன்று தொடர்ச்சியாக உள்ளது.

எனவே விண்ணப்பதாரர் திருமதி.R.செண்பகாதேவி, க/பெ.T.R.வரதராஜன் என்பவரின் கோரிக்கையினை ஏற்று விருதுநகர் மாவட்டம், அருப்புக்கோட்டை வட்டம், சுண்டக்கோட்டை கிராமம், பட்டா புல எண்கள்: 44/1 (P) (0.43.50), 44/5(P) (0.34.5), 44/6 (0.14.5), 44/7 (0.14.5) & 44/8 (0.43.0) மொத்தம் 1.50.00 ஹெக்டேரில் உடைகல் மற்றும் கிராவல் குவாரி உரிமம் ஐந்தாண்டுகளுக்கு (5) தமிழ்நாடு சிறுகனிம சலுகை விதிகள் விதிஎண்.19 (1) மற்றும் 20-ன் படி பின்வரும் நிபந்தனைகளுக்குட்பட்டு வழங்க பரிந்துரை செய்கிறேன்.

நிபந்தனைகள்:

- 1) அருகிலுள்ள பட்டா நிலங்களுக்கு 7.5 மீ பாதுகாப்பு இடைவெளி விடுத்து குவாரி செய்தல் வேண்டும்.
- 2) புலத்தின் தெற்கில் புல எண் 43-ல் செல்லும் ஓடை மற்றும் புறம்போக்கு நிலங்களுக்கு 10 மீட்டர் பாதுகாப்பு இடைவெளி விடுத்து குவாரி செய்தல் வேண்டும்.
- 3) பொதுமக்கள் / விவசாய நிலங்களுக்கு பாதிப்பு ஏற்படாத வகையில் தகுதி வாய்ந்த அங்கீகரிக்கப்பட்ட நபர்கள் மூலம் வெடிமருந்துகள் சேமிக்கப்பட்டு குவாரியில் வெடித்தல் வேண்டும். குவாரியில் குறைந்த சக்தி கொண்ட வெடி மருந்துகளை பயன்படுத்தல் வேண்டும்.
- 4) சுரங்கத்திட்டம் மற்றும் சுற்றுச்சூழல் தடையில்லாச் சான்று குத்தகை உரிமம் வழங்குவதற்கு முன் சமர்ப்பிக்க வேண்டும்.

⑧ K. Chempakav

38

- 5) குவாரியில் வேலை செய்யும் தொழிலாளர்கள் தொழிலாளர் நலவாரியம் மற்றும் காப்பீடு திட்டத்தில் பதிவு செய்து தொழிலாளர் நலன் பேண்படு வேண்டும்.
- 6) குழந்தை தொழிலாளர்களை குவாரி பணியில் அமர்த்தக் கூடாது.
- 7) கனிமங்களை வாகனங்களில் கொண்டு செல்லும் போது பாதுகாசிகள், பொது மக்கள் மற்றும் பிற வாகனங்கள் பாதிக்காதவண்ணம் தார்பாய்கள் கொண்டு மூடி எடுத்துச் செல்ல வேண்டும்.



[Handwritten Signature]
உதவி இயக்குநர்,
புவியியல் மற்றும் சுரங்கத்துறை,
விருதுநகர்.

⊗ K. Chempala Bai

RC 38/6

39



Mining Plan: Tmt.R.ChempakaDevi Rough Stone & Gravel Quarry:

ANNEXURE III

Copy of Aadhar & PAN card of Applicant

⊗ B. Chempaka Devi

PC 39/68

40


இந்திய சர்க்கார்
Government of India
 ராஜ் நாயுடு சிவசுப்பிரமணியன்
 Raju Naidu Chivassubramanyam
 ராஜ் நாயுடு சிவாஜி
 Father: Raju Naidu
 சிவசுப்பிரமணியன் / சிவசுப்பிரமணியன்
 Chivassubramanyam / Chivassubramanyam

5386 4582 3834

ஆதார - சாதாரண மனிதனின் அதிகாரம்


22 NOV 2022
Unique Identification Authority of India
 ராஜ் நாயுடு சிவசுப்பிரமணியன்
 Raju Naidu Chivassubramanyam
 ராஜ் நாயுடு சிவாஜி
 Father: Raju Naidu
 சிவசுப்பிரமணியன் / சிவசுப்பிரமணியன்
 Chivassubramanyam / Chivassubramanyam

5386 4582 3834


आयकर विभाग
INCOME TAX DEPARTMENT
R. CHEMPAKADEVI
RAJU NAJDU
11/11/1946
 Permanent Account Number
ABGPC7889N

भारत सरकार
GOVT. OF INDIA



ராஜ் நாயுடு சிவசுப்பிரமணியன்
 Raju Naidu Chivassubramanyam
 ராஜ் நாயுடு சிவாஜி
 Father: Raju Naidu
 சிவசுப்பிரமணியன் / சிவசுப்பிரமணியன்
 Chivassubramanyam / Chivassubramanyam

⊗ R. Chempaka


R. GURURAMACHANDRAN, M.Sc.,
 Qualified Person
 (ROP/MAS/224/2010/A)

RC 40/60

41



Mining Plan: Tmt R.ChempakaDevi Rough Stone & Gravel Quarry:

ANNEXURE IV

Copy of FMB - 44

⊗ B. Chempaka Devi

pac 41 / 68

District : Virudhunagar

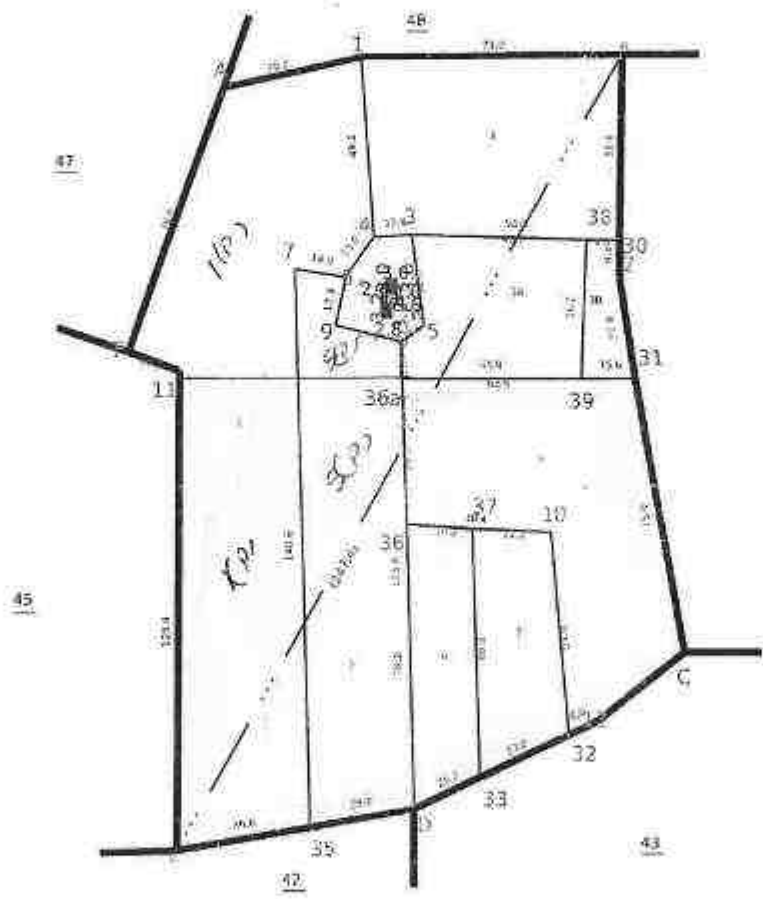
Survey No : 44

Taluk : ARUPPUKOTTAI

Area : Hect 02 Ares 56.00

Village : Sundakkottai [24]

Scale : 1 : 2000



(Signature)
 C. Chempaka Devi

(Signature)

R. GURUPRAMACHANDRAN, M.Sc.,
 Qualified Person
 (R2P/MAS/224/2010/A)

pc 42/68

Date of Issue: 03-10-2022 10:43:49

mv.240



Y12

43



Mining Plan: Tmt.R.ChempakaDevi Rough Stone & Gravel Quarry:

ANNEXURE V

**Copies of Patta, Adangal
A-Register & A-1 Notice.**

⊗ K. Chempaka Devi

PC 43/65

44



தமிழக அரசு

வருவாய்த் துறை

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

மாவட்டம் : விருதுநகர்

வட்டம் : அருப்புக்கோட்டை

வருவாய் பிரிமம் : கண்டக்கோட்டை

பட்டா எண் : 577

உரிமையாளர்கள் பெயர்

1. T.R.வந்தாலன்

மனைவி -

சென்பாத்தேவி



பல எண்	உ.ட.பிரிவு	புன்செய்		நன்செய்		மற்றவை		குறிப்புகள்
		பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை	
		ஹெக்ட - ஏர்	ரூ - பை	ஹெக்ட - ஏர்	ரூ - பை	ஹெக்ட - ஏர்	ரூ - பை	
44	1 ✓	0 - 82.00	2.28	--	--	--	--	2020/0103/26/090180- -- 23-07-2020
44	5 ✓	0 - 39.50	1.09	--	--	--	--	2020/0103/26/090180- -- 23-07-2020
44	6 ✓	0 - 14.50	0.40	--	--	--	--	2020/0103/26/090180- -- 23-07-2020
44	7 ✓	0 - 14.50	0.40	--	--	--	--	2020/0103/26/090180- -- 23-07-2020
44	8 ✓	0 - 43.00	1.19	--	--	--	--	2020/0103/26/090180- -- 23-07-2020
		1 - 93.50	5.36					

குறிப்பு2 :



1. கமற்கண்ட தகவல் / சான்றிதழ் தகவல் விவரங்கள் மீள் பதிவேட்டின்மூலம் பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 26/06/2024/00577/70439 என்ற குறிப்பு எண்ணை உள்ளிடு செய்து உறுதி செய்துகொள்ளவும்.
2. இத் தகவல்கள் 27-08-2022 அன்று 05:21:20 AM நேரத்தில் சுட்டிக்காட்டப்பட்டது.
3. கைபேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்.

Ⓟ B. Chempaka

RC 44/68

1432 - ஆம் பசலியில் அருங்கோட்டை

மாவட்டம் அருங்கோட்டை வட்டம் திருச்சிராப்பள்ளி

கிராமக் கணக்கு

நில வரித் திட்டத்தின்படி புலன்களின் விபரம்.					சாகுபடி யாளரின் பெயர்.	முதல் பிரேகம்						
(1) நில அளவை எண்.	(2) உட்பிரிவு எண்.	(3) பரப்பு.	(4) தர்வை.	(5) ஒரு பிரேகம் அல்லது இரு பிரேகம்.	நிலத்தின் எந்த பகுதி யாவது சாகுபடியாளரால் பயிரிடப்பட்டுள்ளது.	எந்த மாதத்தில் பயிர் செய்யப்பட்டது எந்த மாதத்தில் அறுவடை செய்யப்பட்டது.	பயிரின் பெயர்.	பயிரான தறுவடை யான பரப்பு.	உண்டான பரபரம் பாப்சல் ஆதாரம்.	விளைச்சல் அளவு விழுக்காடு.		
14	1	0.82	2.28		செய்யாது	-	செய்யாது	-	-	-		
	5	0.335	1.57		செய்யாது	-	செய்யாது	-	-	-		
	6	0.45	0.40		செய்யாது	-	செய்யாது	-	-	-		
	7	0.45	0.40		செய்யாது	-	செய்யாது	-	-	-		
	8	0.45	1.19		செய்யாது	-	செய்யாது	-	-	-		
					செய்யாது	-	செய்யாது	-	-	-		
					செய்யாது	-	செய்யாது	-	-	-		
					செய்யாது	-	செய்யாது	-	-	-		
					செய்யாது	-	செய்யாது	-	-	-		
					செய்யாது	-	செய்யாது	-	-	-		
					செய்யாது	-	செய்யாது	-	-	-		
					செய்யாது	-	செய்யாது	-	-	-		
					செய்யாது	-	செய்யாது	-	-	-		
					செய்யாது	-	செய்யாது	-	-	-		
					செய்யாது	-	செய்யாது	-	-	-		
					செய்யாது	-	செய்யாது	-	-	-		
					செய்யாது	-	செய்யாது	-	-	-		
					செய்யாது	-	செய்யாது	-	-	-		
					செய்யாது	-	செய்யாது	-	-	-		
					செய்யாது	-	செய்யாது	-	-	-		
					செய்யாது	-	செய்யாது	-	-	-		
					செய்யாது	-	செய்யாது	-	-	-		
					செய்யாது	-	செய்யாது	-	-	-		
					செய்யாது	-	செய்யாது	-	-	-		
					செய்யாது	-	செய்யாது	-	-	-		
					செய்யாது	-	செய்யாது	-	-	-		



கிராம துரிதக் அலுவலர்
பொம்மக்கோட்டை கிராமம்
அருங்கோட்டை வட்டம்.

RC 45/100

[Signature]

46

34

தி. எண். 131 - கண்டலக்கோட்டை.



1	2	3	4	5	6	7	8	9	10	11
43	43	0	0	0 76.0	...
44	44-1	0	0	...	7-2	3	2 77	0 82.0	2 28	138 மு. பால கிருஷ்ண செட்டியார்.
	2	-2	0	0	...	7-2	3 2 77	0 35.0	0 97	47 நா. ராமசாமி செட்டியார்.
	3A	-3பா	0	0	...	7-2	3 2 77	0 17.5	0 48	91 க. ஜெயராமன்.
	3B	-3பா	0	0	...	7-2	3 2 77	0 05.0	0 14	401 க. ரத்தினராம லீலகர்.
	4	-4	0	0	...	7-2	3 2 77	0 05.0	0 13	193 மு. மாய கிருஷ்ண செட்டியார் மற்றும் ஐந்து பேர்களும்.*
	5	-5	0	0	...	7-2	3 2 77	0 39.5	1 09	198 நா. ராமசாமி செட்டியார்
	6	-6	0	0	...	7-2	3 2 77	0 14.5	0 40	47 நா. ராமசாமி செட்டியார்.
	7	-7	0	0	...	7-2	3 2 77	0 14.5	0 40	91 க. மதுராசலி கி. கி.
	8	-8	0	0	...	7-2	3 2 77	0 43.0	1 19	84 நா. குருசாமி செட்டியார்.
								2 56.0	7 08	
45	45-1பா	0	0	...	7-2	3	2 77	0 20.0	0 55	378 மு. பாண்டி நாடார்.
	1B	-1பா	0	0	...	7-2	3 2 77	0 22.0	0 61	240 கு. தங்கமுத்து நாடார்.
	1C	-1பா	0	0	...	7-2	3 2 77	0 17.5	0 49	402 கு. குருசாமி நாடார்.
	1D	-1பா	0	0	...	7-2	3 2 77	0 13.5	0 37	215 மு. பாண்டி நாடார்.
	1E	-1பா	0	0	...	7-2	3 2 77	0 02.0	0 06	403 பாண்டி நாடார் மற்றும் மூன்று பேர்களும்.*
	2A	-2பா	0	0	...	7-2	3 2 77	0 07.0	0 19	215 மு. பாண்டி நாடார்.
	2B	-2பா	0	0	...	7-2	3 2 77	0 06.0	0 17	386 பா. ஜெயமணி நாடார்.
		-2பா	0	0	...	7-2	3 2 77	0 06.5	0 18	404 கு. தங்கமுத்து நாடார்.
								0 94.5	2 62	

சிராமநாதர்


சிராமநாதர்
 கிராமநாதர்
 அருப்புக்கோட்டை வட்டம்.

* - விவரம் பக்கம் 148 பார்க்கவும்.

AC 46/13 K. Chempakav

47

கற்குவாரி உரிமம் வழங்குவது தொடர்பான "அ1" விளம்பர அறிவிப்பு

விருதுநகர் மாவட்டம், அருப்புக்கோட்டை வட்டம், அருப்புக்கோட்டை கிராமம்
1, வடுக்கோட்டை, என்ற முகவரியில் வசித்து வரும் T.R வரதராஜன் மனைவி
செண்பகாதேவி என்பவர், சுண்டக்கோட்டை கிராமத்தில், கீழ்க்கண்ட புல எண்களில்
ஐந்து வருடங்களுக்கு உடைகல், ஐல்லி, மற்றும் கிராவல் எடுத்துக்கொள்ள
கற்குவாரி உரிமம் கோரி, விருதுநகர் மாவட்ட ஆட்சியரிடம் விண்ணப்பம்
செய்துள்ளார் என இதன்மூலம் அறிவிப்பு விளம்பரப்படுத்தப்படுகிறது.

புல எண்	பரப்பு ஹெக்டா ஏக்கர்	பட்டா எண்	உரிமையாளர் பெயர்
44/1	0.82.00	535	ராமசாமி நாயக்கர் மகன் T.R.வரதராஜன்
44/5	0.39.50	51	T.R.வரதராஜன் மகன் T.R.Vபவீனா
44/6	0.14.50	535	ராமசாமி நாயக்கர் மகன் T.R.வரதராஜன்
44/7	0.14.50	535	ராமசாமி நாயக்கர் மகன் T.R.வரதராஜன்
44/8	0.43.00	535	ராமசாமி நாயக்கர் மகன் T.R.வரதராஜன்
49/9	0.14.00	535	ராமசாமி நாயக்கர் மகன் T.R.வரதராஜன்
49/10	0.05.50	535	ராமசாமி நாயக்கர் மகன் T.R.வரதராஜன்
மொத்தம்	2.13.00		

மேற்படி புலங்களில் மனுதாரர் T.R வரதராஜன் மனைவி செண்பகாதேவி
என்பவர் கற்குவாரி செய்வதற்கு ஆட்சேபிப்பவர்கள், இந்த அறிவிப்பு செய்யப்படும்
நாளிலிருந்து 15 தினங்களுக்குள் பொம்மக்கோட்டை கிராம நிர்வாக அலுவலரிடம்
தங்கள் ஆட்சேபணையை எழுத்துப் பூர்வமாக தெரிவிக்கலாம் என விளம்பரம்
செய்யப்படுகிறது.

நாள் = 10/12/18


Village Administrative Officer
Bommaikottai
கிராம நிர்வாக அலுவலர்
Virudhunagar (Dist.)

⊗ K. Cheypankumar

RC 15/62

48

71 85

கற்குவாரி உரிமம் வழங்குவது தொடர்பாக ஆட்சேபனை இல்லை என்பதற்கான



பொது மக்களின் வாக்குமூலம்

அருப்புக்கோட்டை வட்டம், பொம்மக்கோட்டை கிராம நிர்வாக அலுவலரால், T.R வரதராஜன் மனைவி செண்பகாதேவி என்பவருக்கு, கற்குவாரி உரிமம் வழங்குவது தொடர்பாக 10.12.2018 அன்று விளம்பரப்படுத்தப்பட்ட 'அ1' அறிவிப்பு, அன்றய தேதியில் கிராம நிர்வாக அலுவலகம், ஊராட்சி மன்ற அலுவலகம் ஆகியவற்றில் ஓட்டப்பட்டிருந்ததை கண்டோம்.

மேற்படி 'அ1' அறிவிப்பில் உள்ள அட்டவணையில் கண்ட புல எண்களில் ஐந்து வருடங்களுக்கு உடைகல், ஜல்லி, மற்றும் கிராவல் எடுத்துக்கொள்ள கற்குவாரி உரிமம் கோரி மனுதாரர் T.R வரதராஜன் மனைவி செண்பகாதேவி என்பவர், விருதுநகர் மாவட்ட ஆட்சியரிடம் விண்ணப்பம் செய்துள்ளார் என்பதை மேற்படி 'அ1' அறிவிப்பு மூலம் அறிந்து கொண்டோம்.

மேற்படி 'அ1' அறிவிப்பில் உள்ள அட்டவணையில் கண்ட புல எண்களில் மனுதாரர் T.R வரதராஜன் மனைவி செண்பகாதேவி என்பவர் ஐந்து வருடங்களுக்கு உடைகல், ஜல்லி, மற்றும் கிராவல் எடுத்துக்கொள்ள கற்குவாரி உரிமம் வழங்குவதற்கு எந்தவிதமான ஆட்சேபனையும் இல்லை என்பதை இதன்மூலம் தெரியப்படுத்திக் கொள்கிறோம்.

- 1) கி.வெ.சு.சு.சு. விருதுநகர் 9/10 ரிபபிளிகன்
- 2) R.V. வெள்ளையன் விருதுநகர் 9/10 ரிபபிளிகன்
- 3) சு.சு.சு. விருதுநகர் 9/10 ரிபபிளிகன்
- 4) R.சு.சு.சு. விருதுநகர் 9/10 ரிபபிளிகன்
- 5) P.சு.சு.சு. விருதுநகர் 9/10 ரிபபிளிகன்
- 6) சு.சு.சு. விருதுநகர் - 9/10 ரிபபிளிகன்

1 என மனுதாரர்

25/12/18

Village Administrative Officer
Bommiakottai
Thiruppurukottai (Tk.)
Virudhunagar (Dist.)

RC 48/60

150

49



Mining Plan: Tmt.R.ChempakaDevi Rough Stone & Gravel Quarry:

ANNEXURE VI

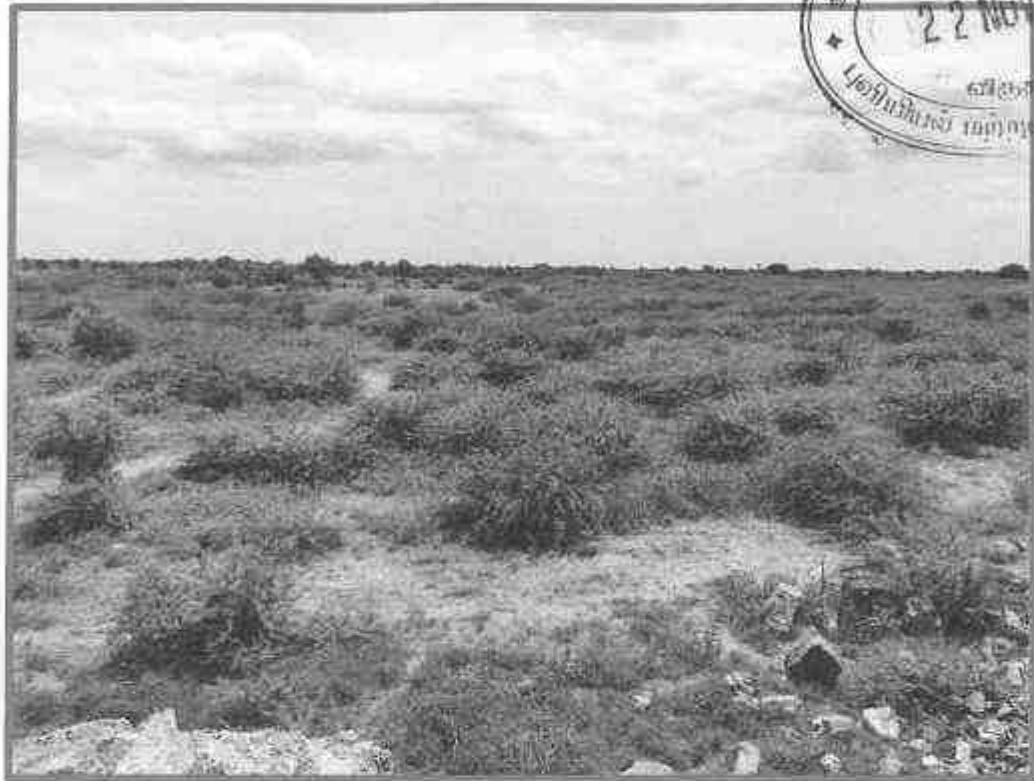
SITE Photos

ⓧ R. Chempaka Devi
RCHA/68

(50)

SITE PHOTOS:-

1. View from North to south:



2. View from East to West



		Decimal	DMS
	Latitude	9.473261	9°28'23" N
	Longitude	78.183894	78°11'2" E
2022-09-10 (Sat) 12:58 (PM)			

R. Gururamachandran

R. GURURAMACHANDRAN, M.Sc.,

Qualified Person

(RQP/MA/3/224/2010/A)

(X) B. Chempaka Rao

RC50/hc

51



Mining Plan: Tmt.R.ChempakaDevi Rough Stone & Gravel Quarry:

ANNEXURE VII

Copies of Qualified Person Certificates

R. Chempaka Devi

RC 51/68

52



**CERTIFICATE OF RECOGNITION AS
QUALIFIED PERSON TO PREPARE MINING PLANS
(Under Rule 22 C of Mineral Concession Rules 1960)**

Shri R. Gururamachandran resident of G-2, Sree Apartments, 4, 29th Cross, Avvai Nagar, Latuspet, Puducherry - 605 008, son of Shri K. Rengasamy having given satisfactory evidence of his qualifications and experience is hereby granted recognition under Rule 22C of the Mineral Concession Rules, 1960 as a Qualified Person to prepare Mining Plans.

His registration number is

RQP/MAS/224/2010/A

recognition is valid for a period of ten years ending 24/11/2020.

Place : Chennai
Date : 25.11.2010

[Signature]
Regional Controller of Mines
Indian Bureau of Mines
Chennai Region

[Signature]
R. Gururamachandran

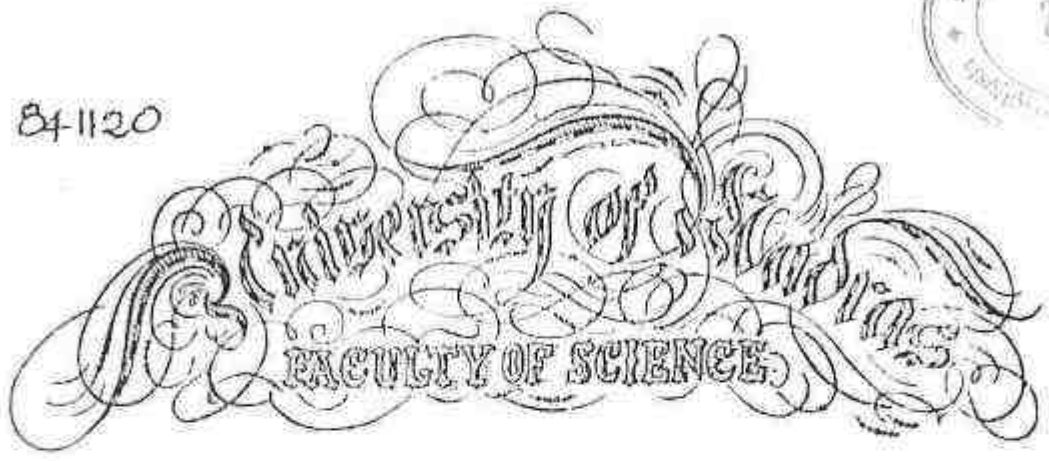
[Signature]
R. GURURAMACHANDRAN, M.Sc.,
Qualified Person
(RQP/MAS/224/2010/A)

RC 52/68

53



841120



The Senate of the University of Madras hereby makes known that R. Gururamachandran has been admitted to the Degree of Master of Science, he having been certified by duly appointed Examiners to be qualified to receive the same, and having been by them placed in the First Class, at the Examination held in the month of April 1986 in Branch VII - A. Applied Geology

Given under the seal of the University.

Senate House
September 20, 1986

Registrar.

Vice-Chancellor.

R. Chempakavijay

R. GURURAMACHANDRAN, M.Sc.,
Qualified Person
(RQP/MAS/224/2010/A)

RC 53/68



The Syndicate of the Anna University hereby makes known that

R. GURURAMACHANDRAN

has been admitted to the Degree of Bachelor of Science in Applied Geology, he having satisfactorily completed the prescribed course of study at the College of Engineering, and having been certified by duly appointed Examiners to be qualified to receive the same and having been placed by them in the **FIRST** Class at the Examination held in the month of **APRIL** in the year 1983.



under the Seal of the University

University Buildings,
Madras - 600 025

Dated **26 FEB 1984**

S. S. Srinivasan
Registrar

V. K. Srinivasan
Vice-Chancellor

P. Chempakalakshmi

R. Gururamachandran
R. GURURAMACHANDRAN, M.Sc.,
Qualified Person
(RQP/MAS/224/2010/A)

156
RC 52/68

55



M.M. Detergents Company (P) Ltd.

No.1, Race Course Road, Nagalakshmi Theatre Complex, Dindigul - 624 005
Phone: 0451 - 2422206 Fax: 0451 - 2410122

MMD/DGL/2010-11


23rd June 2010.

CERTIFICATE

This is to certify that Mr. R.Gururamchandran M.Sc., working at our Nadumandalam Mines, Narham taluk, Dindigul district as Manager - Geology & Exploration since June 2008. He is also responsible for development of new mines for Lime Stone, Calcite and Dolomite at various districts.

For M.M.Detergent Company (P) Ltd.


(M.SUGUMAR)
AGENT


R. GURURAMCHANDRAN, M.Sc.,
Qualified Person
(RQP/IAS/224/2010/A)


P. Cheepakka

RC 55/68

(56)

VEMBANUR SILICA SAND MINES

Office : O/ 60, Chera Street, Paari Nagar, CHENNAI 600083.
Mines at Vembanur village, Cheyyur taluk, Kancheepuram district.

01-05-2006

EXPERIENCE CERTIFICATE

Name and Address : R.GURURAMACHANDRAN M.Sc.,
5, 23rd Cross, Avvai Nagar, Lawspet,
PONDICHERRY 605 008.

Position : Geologist cum Manger


Date of Joining : 02-12-2002

Date of Leaving : 30-04-2006

Conduct : Good.

For Vembanur Silica Sand Mines


A. THOMAS


R. GURURAMACHANDRAN. M.Sc.,
Qualified Person
(RQP/MAS/224/2010/A)


P. K. Chempaka

RL sb/68

57



Mining Plan: Tmt.R.ChempakaDevi Rough Stone & Gravel Quarry:

PLATES - I to VIII

⊗ R. Chempaka Devi

PC 57/68

57

PLATE : 1

NAME OF THE APPLICANT:-
THIRUMATHI.R.CHEMPAKA DEVI,
W/O T.R.VARADARAJAN,
No.1,RAMASAMY NAICKER STREET,
VADUGARKOTTAI,
ARUPPUKOTTAI TALUK-626 101,
VIRUDHUNAGAR-DISTRICT.

LOCATION OF THE APPLIED AREA:-
DISTRICT : VIRUDHUNAGAR
TALUK : ARUPPUKOTTAI
VILL.. NAME : SUNDAKOTTAI
S.F.Nos. : 44/1(P),5(P),6,7,8
EXTENT : 1.50.0 HECTARE

INDEX:-

LEASE APPLIED AREA

LEGEND

- State Boundary
- District Boundary
- National Highway
- Major Road
- Railway
- River/Lake
- State Capital
- District Headquarters
- City/Town

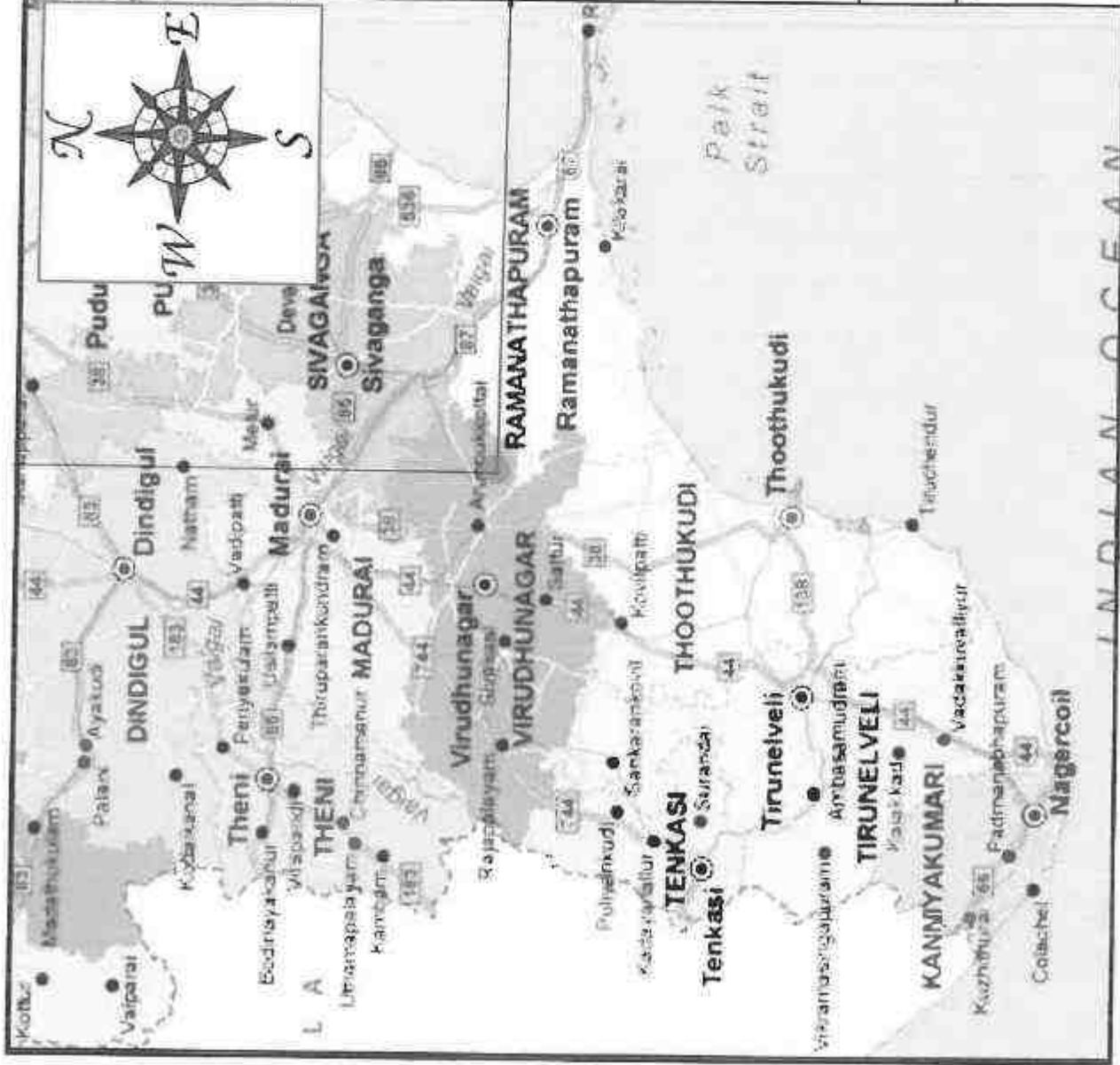
LOCATION PLAN

SCALE: 1CM=4.9Kms.

PREPARED BY:-

R. GUJIRAMA CHANDRAN, M.Sc.
Qualified Person

(RQP/MAS/224/2010(A))



oc 58/68

⊗ K. Chempaka Devi

PLATE :IA

NAME OF THE APPLICANT:-
THIRUMATHI.R.CHEMPAKA DEVI,
W/O T.R.VARADARAJAN,
No.1,RAMASAMY NAICKER STREET,
VADUGARKOTTAI,
ARUPPUKOTTAI TALUK-626 101,
VIRUDHUNAGAR-DISTRICT.

LOCATION OF THE APPLIED AREA:-
DISTRICT : VIRUDHUNAGAR
TALUK : ARUPPUKOTTAI
VILL. NAME :SUNDAKOTTAI
S.F.Nos. :44/1(P),5(P),6,7,8
EXTENT :1.50.0 HECTARE

INDEX:-

- M.L .AREA
- APPROACH ROAD
- NATIONAL HIGHWAY-(38)
- STATE HIGHWAY(SH184)
- DISTRICT ROAD

KEY MAP

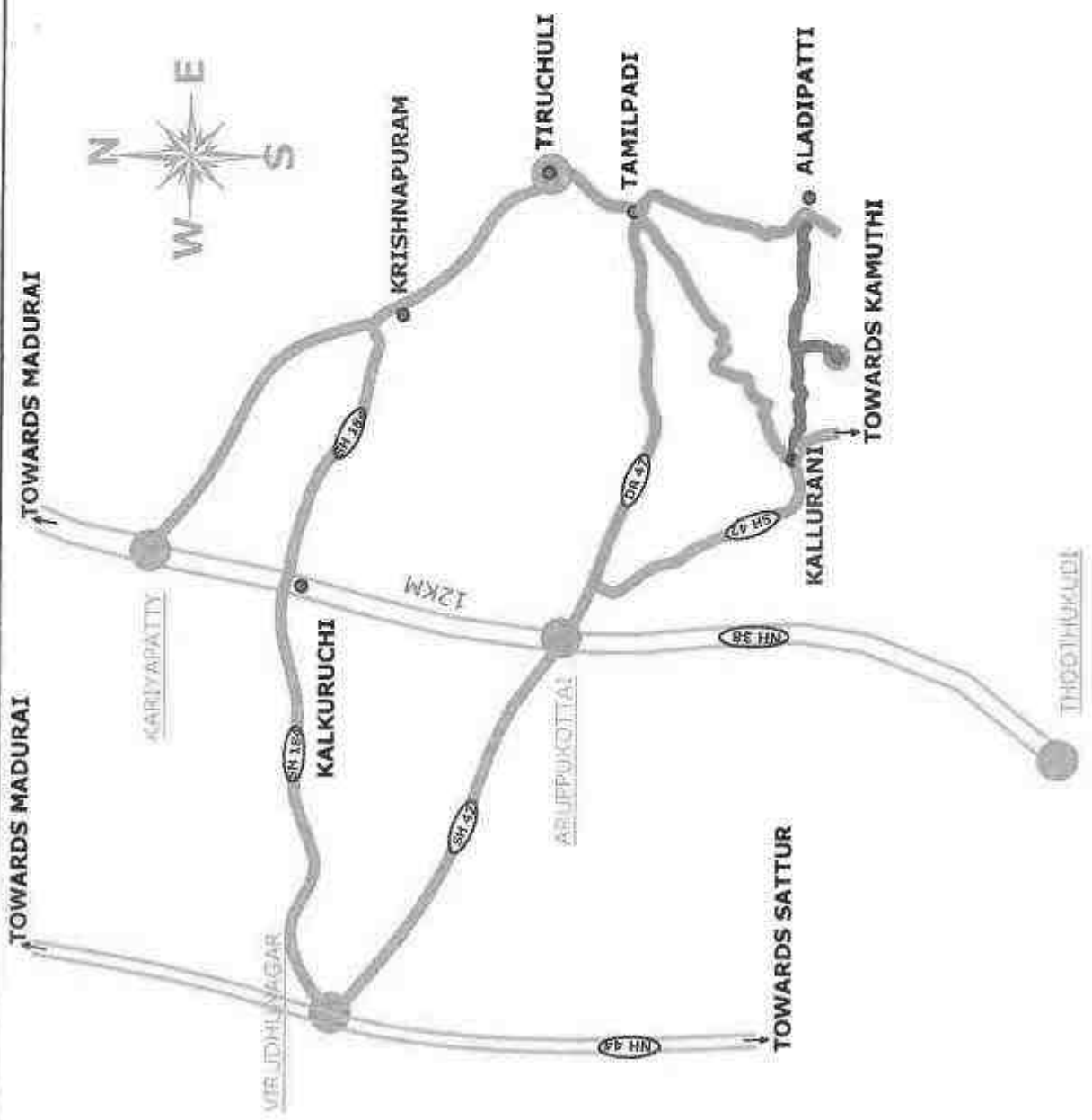
NOT TO SCALE

PREPARED BY

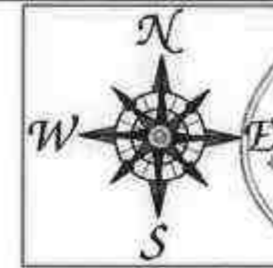
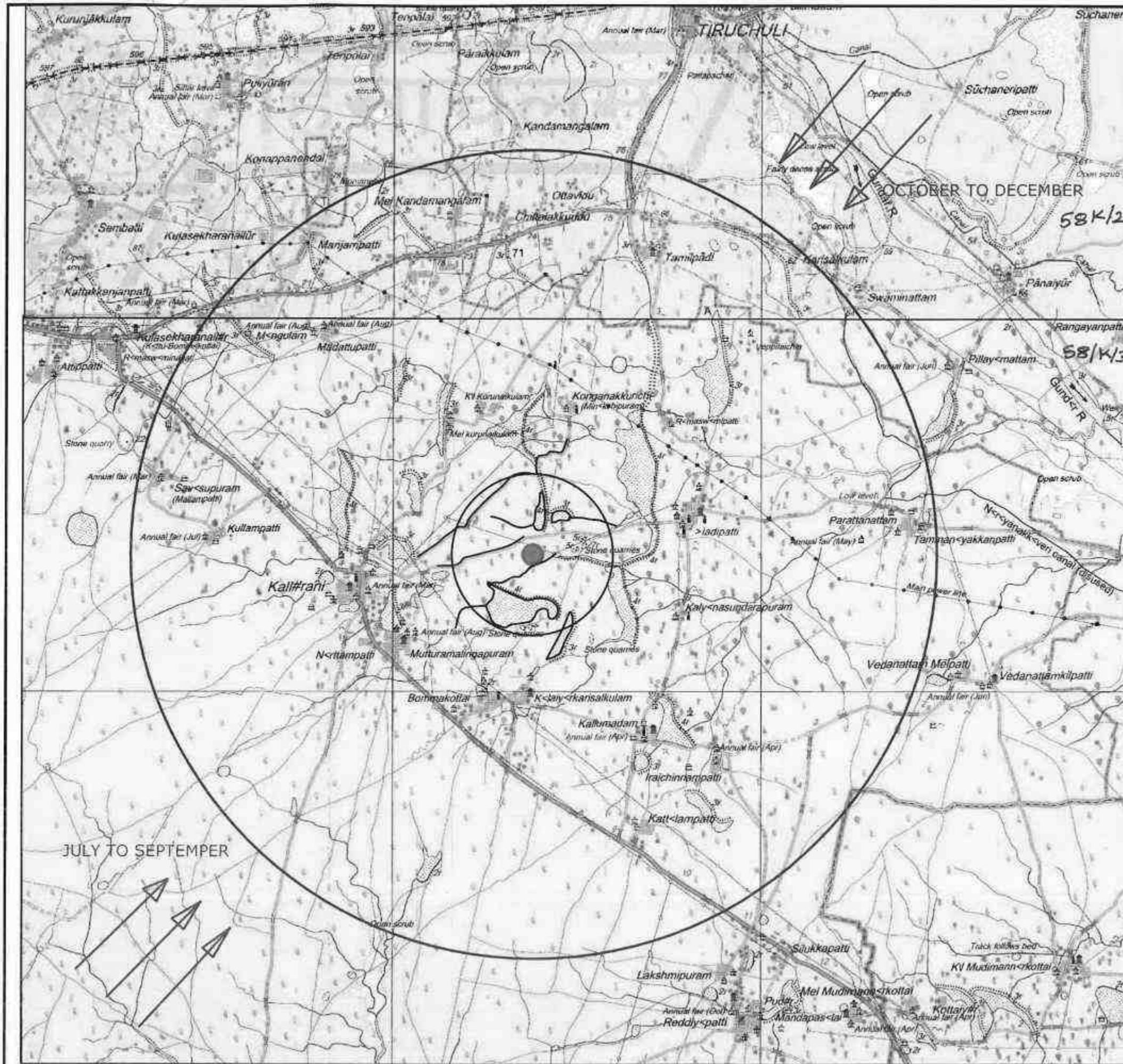


R. GURURAMACHANDRAN, M.S.
Qualified Person

(RQPI/MAS/224/2018/IA)






RC 59/68 B. Chempaka














NAME OF THE APPLICANT:-
 THIRUMATHI.R.CHEMPAKA DEVI,
 W/O T.R.VARADARAJAN,
 No.1,RAMASAMY NAICKER STREET,
 VADUGARKOTTAI,
 ARUPPUKOTTAI TALUK-626 101,
 VIRUDHUNAGAR-DISTRICT.


LOCATION OF THE APPLIED AREA:-
 DISTRICT : VIRUDHUNAGAR
 TALUK : ARUPPUKOTTAI
 VILL.. NAME :SUNDAKOTTAI
 S.F.Nos. :44/1(P),5(P),6,7,8
 EXTENT :1.50.0 HECTARE

TOPO SHEET NO:-58 K/3
 LATITUDE : 09° 28' 21.10" to 09° 28' 25.30" N
 LONGITUDE : 78° 10' 57.95" to 78° 11' 02.30" E
 LEASE AREA 
 WIND DIRECTION 
 5 KM RADIUS 

CONVENTIONAL SYMBOLS

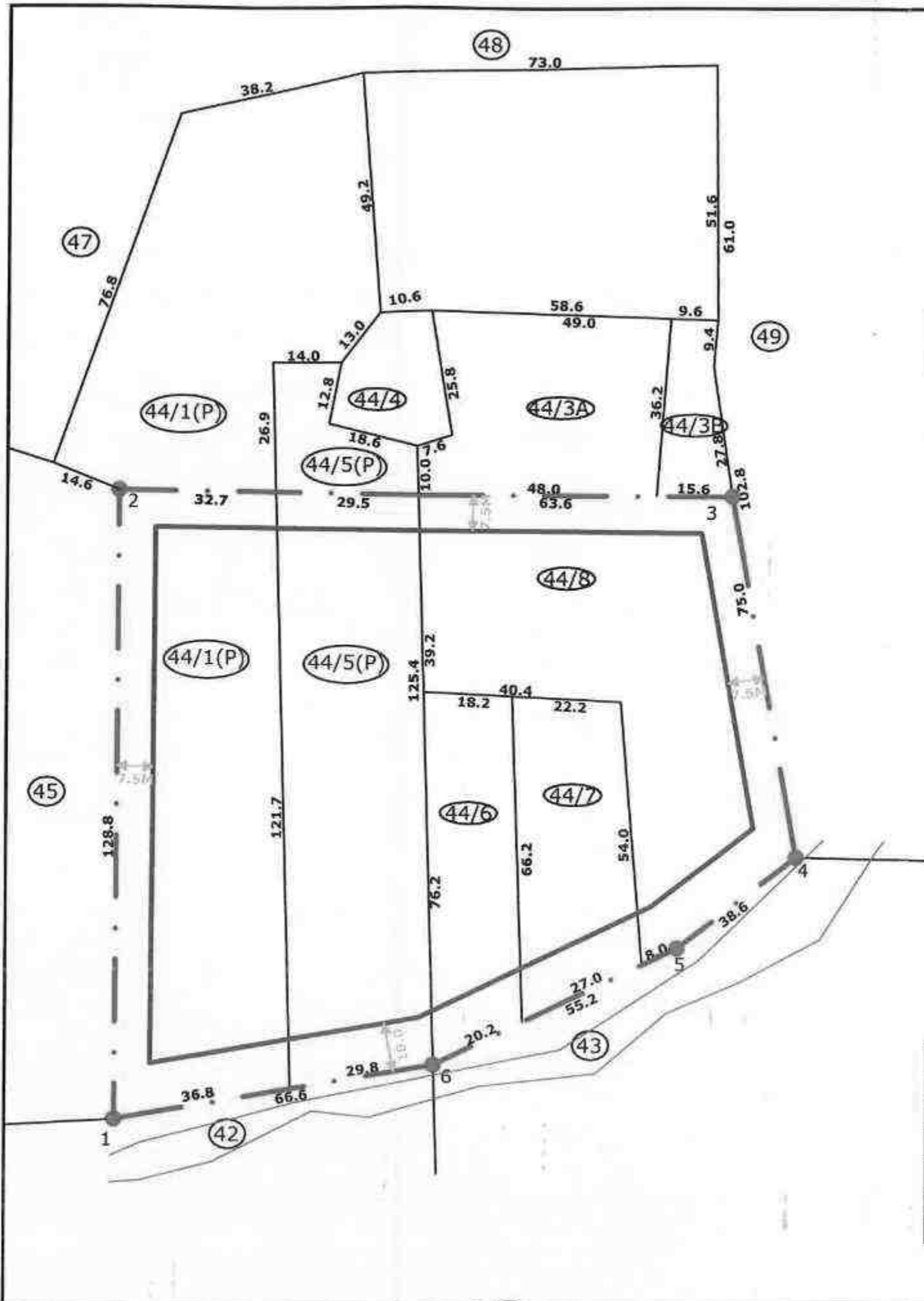
Express highway, with rail, with bridge, with distance stone	
Road, metalled according to importance	
Track, single carriage way, according to importance	
Unmetalled road, Cart track, Path, bank with grass, Footpath	
Drainage, with brick or well, unmetalled, Cistern	
Canal, masonry or rock-lined, with or without	
Flow, dry, with water channel, with flood & rocks, Tidal river	
Canal, masonry, brick, stone, concrete, Asado	
Well, lined, unlined, Tanka, well, Spring, Tank, perennial, dry	
Embankment, road or rail, sea, Breaker ground	
Excavated, 50000 gauge, Aqueduct, bridge with station, water, 500000	

KEY PLAN
 (SCALE:-1:50,000)

PREPARED BY:-

 R. GURURAMACHANDRAN, M.Sc.,
 Qualified Person
 (RQP/MAS/224/2010/A)

RC 60/68 

(67)



SAFETY DISTANCE FROM PATTALANDS = 7.5M
 SAFETY DISTANCE FROM ODAI = 10M

LEASE AREA DETAILS

SF Nos.	EXTENT
44/1(P)	0.43.5Ha
44/5(P)	0.34.5Ha
44/6	0.14.5Ha
44/7	0.14.5Ha
44/8	0.43.0Ha
TOTAL	1.50.0Ha

CORNER PILLARS GPS CO-ORDINATES :

PILLAR	LATITUDE	LONGITUDE
* 1	8° 28' 21.10" N	78° 10' 57.95" E
* 2	8° 28' 25.30" N	78° 10' 58.40" E
* 3	8° 28' 25.10" N	78° 11' 02.30" E
* 4	8° 28' 22.15" N	78° 11' 02.55" E
* 5	8° 28' 21.70" N	78° 11' 01.63" E
* 6	8° 28' 21.30" N	78° 11' 00.00" E

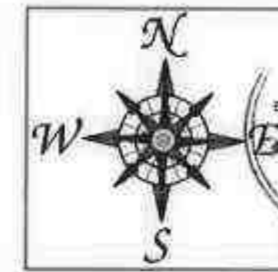


PLATE : III

NAME OF THE APPLICANT:-
 THIRUMATHI.R.CHEMPAKA DEVI,
 W/O T.R.VARADARAJAN,
 No.1,RAMASAMY NAICKER STREET,
 VADUGARKOTTAI,
 ARUPPUKOTTAI TALUK-626 101,
 VIRUDHUNAGAR-DISTRICT.

LOCATION OF THE APPLIED AREA:-
 DISTRICT : VIRUDHUNAGAR
 TALUK : ARUPPUKOTTAI
 VILL.. NAME :SUNDAKOTTAI
 S.F.Nos. :44/1(P),5(P),6,7,8
 EXTENT :1.50.0 HECTARE

INDEX:-

- LEASE APPLIED AREA
- BOUNDARY PILLARS
- SAFETY LINE
- ODAI

MINING LEASE PLAN

SCALE:- 1: 1000

ALL PLANS AND SECTIONS ARE PREPARED BASED ON THE
 LEASE MAP AUTHENTICATED BY STATE GOVERNMENT.

R. GURURAMACHANDRAN, M.Sc.,
 Qualified Person
 (RQP/MAS/224/2010/A)

RC 61/08

Thirumathi R. Chempaka Devi

162

62

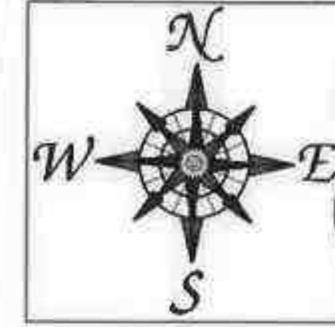
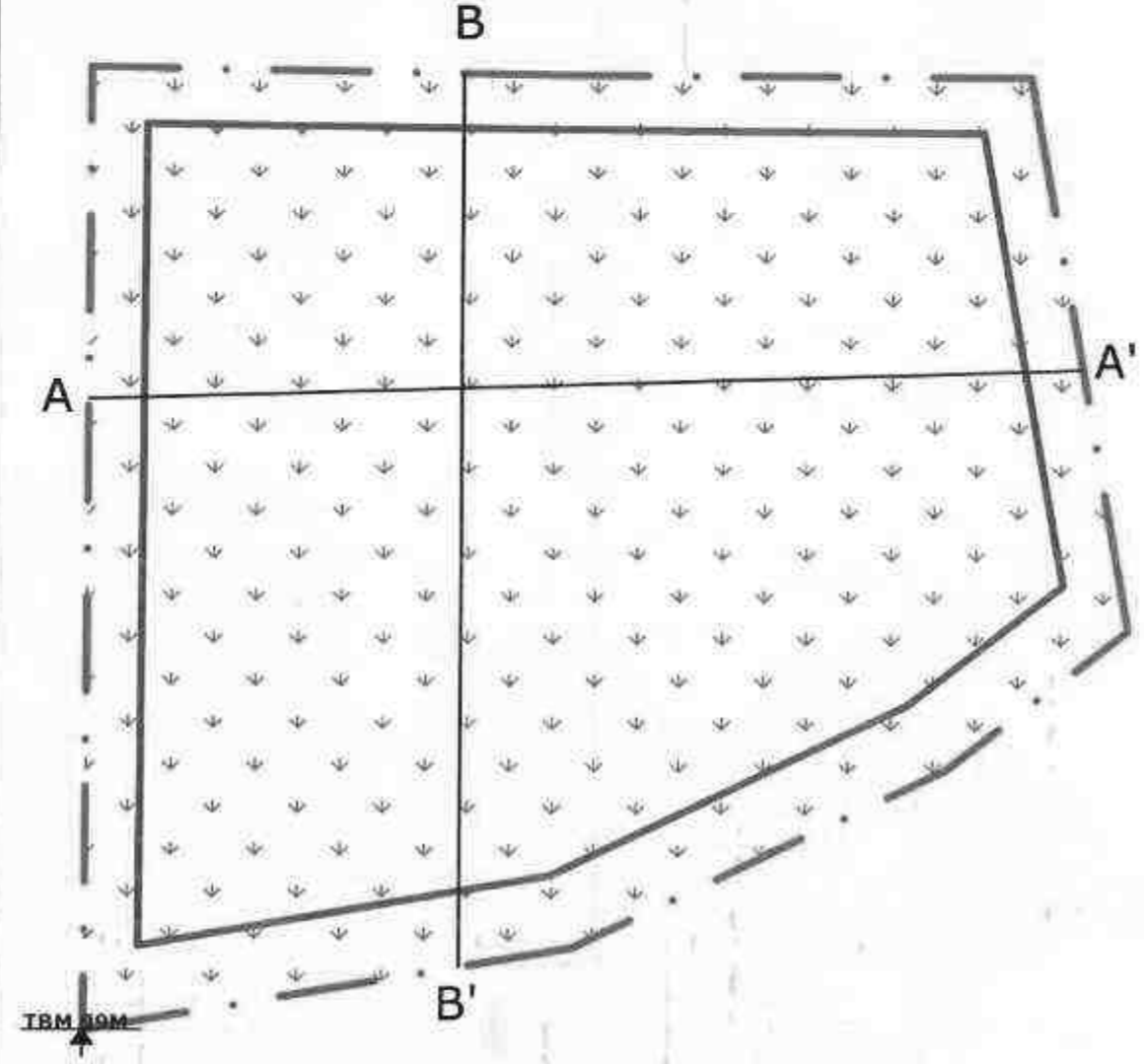
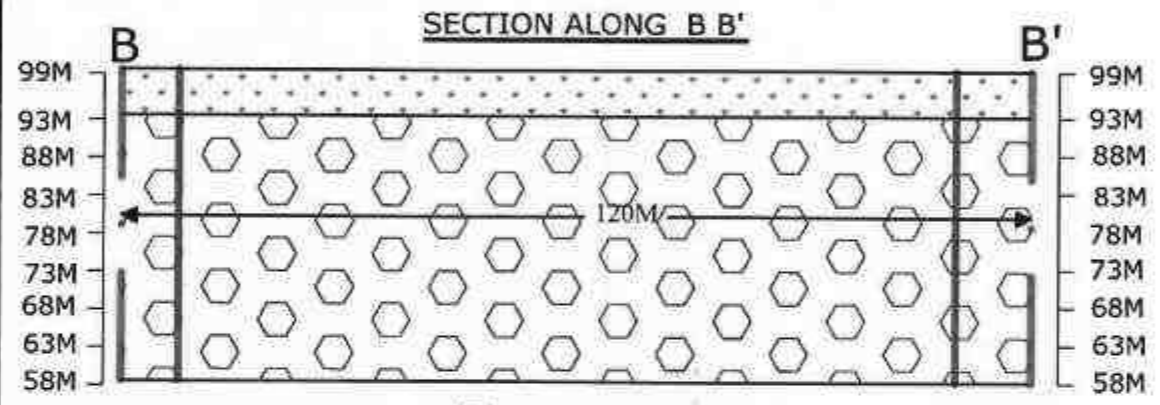
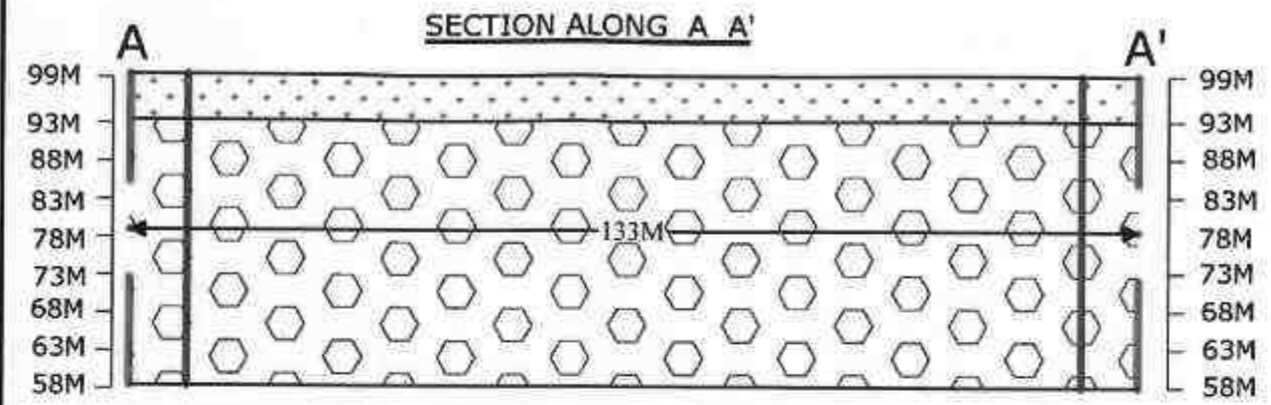


PLATE : IV



GEOLOGICAL RESERVES

SECTION	LENGTH	WIDTH	DEPTH	CHORNOCKITE VOLUME M ³	TOP SOIL WITH GRAVEL VOLUME M ³
A A' & B B'	133M 133M	120M 120M	6.0M 35M	5,58,600	95,760
TOTAL GEOLOGICAL RESERVES				5,58,600	95,760

NAME OF THE APPLICANT:-
 THIRUMATHI.R.CHEMPAKA DEVI,
 W/O T.R.VARADARAJAN,
 No.1,RAMASAMY NAICKER STREET,
 VADUGARKOTTAI,
 ARUPPUKOTTAI TALUK-626 101,
 VIRUDHUNAGAR-DISTRICT.

LOCATION OF THE APPLIED AREA:-
 DISTRICT : VIRUDHUNAGAR
 TALUK : ARUPPUKOTTAI
 VILL. NAME :SUNDAKOTTAI
 S.F.Nos. :44/1(P),5(P),6,7,8
 EXTENT :1.50.0 HECTARE

INDEX:-

- LEASE APPLIED AREA
- SAFETY LINE
- TOP SOIL
- CHORNOCKITE
- BENCH MARK

GEOLOGICAL PLAN AND SECTIONS

SCALE :-1:1000

ALL PLANS AND SECTIONS ARE PREPARED BASED ON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT.

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 Qualified Person

(RQP/MAS/224/20101A)

RC 62/68

R. Chempaka

164

63

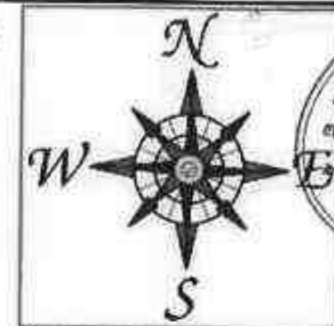


PLATE : V

NAME OF THE APPLICANT:-
 THIRUMATHI.R.CHEMPAKA DEVI,
 W/O T.R.VARADARAJAN,
 No.1,RAMASAMY NAICKER STREET,
 VADUGARKOTTAI,
 ARUPPUKOTTAI TALUK-626 101,
 VIRUDHUNAGAR-DISTRICT.

LOCATION OF THE APPLIED AREA:-
 DISTRICT : VIRUDHUNAGAR
 TALUK : ARUPPUKOTTAI
 VILL.. NAME :SUNDAKOTTAI
 S.F.Nos. :44/1(P),5(P),6,7,8
 EXTENT :1.50.0 HECTARE

INDEX:-

LEASE APPLIED AREA	
SAFETY LINE	
TOP SOIL	
CHORNOCKITE	
BENCH MARK	
I-YEAR ECAVATION	
II-YEAR EXCAVATION	
III-YEAR EXCAVATION	
IV-YEAR EXCAVATION	
V-YEAR EXCAVATION	
EARTH BUND	
SITE SERVICES	

LAND USE PRODUCTION PLAN AND SECTIONS
 SCALE :-1:1000

ALL PLANS AND SECTIONS ARE PREPARED BASED ON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT.

R. Gururam Chandran
 R. GURURAM CHANDRAN, M.Sc.,
 Qualified Person

(RQP/MAS/224/2010/A)

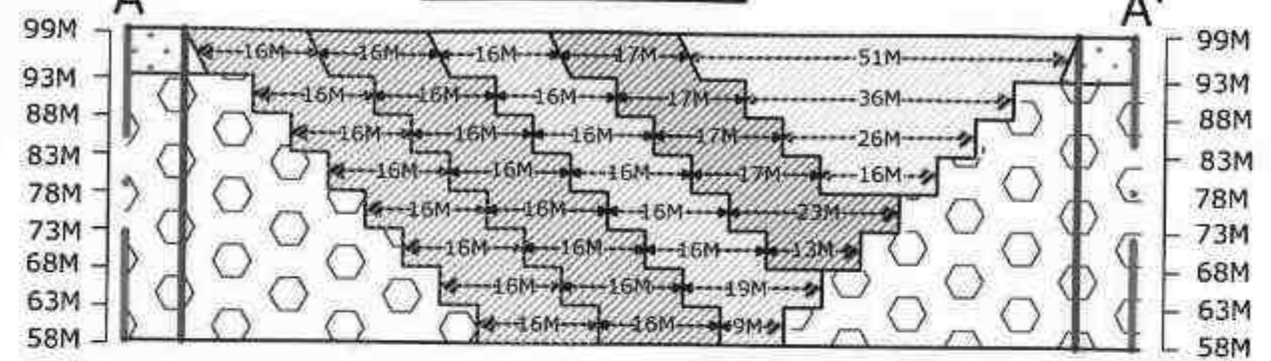
YEARWISE PRODUCTION SCHEDULE FOR FIVE YEARS

SECTION	LENGTH	WIDTH	DEPTH	CHORNOCKITE VOLUME M ³	TOP SOIL WITH GRAVEL VOLUME M ³
A A'&B B'	51M	100M	6.0M	-	30,600
	36M	85M	5.0M	15,300	-
	26M	75M	5.0M	9,750	-
	16M	65M	5.0M	5,200	-
I YEAR EXCAVATION				30,250	30,600
A A'&B B'	17M	100M	6.0M	-	10,200
	17M	85M	5.0M	7,225	-
	17M	75M	5.0M	6,375	-
	17M	65M	5.0M	5,525	-
	23M	55M	5.0M	6,325	-
II YEAR EXCAVATION				28,375	10,200
A A'&B B'	16M	100M	6.0M	-	9,600
	16M	85M	5.0M	6,800	-
	16M	75M	5.0M	6,000	-
	16M	65M	5.0M	5,200	-
	16M	55M	5.0M	4,400	-
	16M	45M	5.0M	3,600	-
	19M	35M	5.0M	3,325	-
III YEAR EXCAVATION				30,450	9,600
A A'&B B'	16M	100M	6.0M	-	9,600
	16M	85M	5.0M	6,800	-
	16M	75M	5.0M	6,000	-
	16M	65M	5.0M	5,200	-
	16M	55M	5.0M	4,400	-
	16M	45M	5.0M	3,600	-
	16M	35M	5.0M	2,800	-
	15M	25M	5.0M	2,000	-
IV YEAR EXCAVATION				30,800	9,600
A A'&B B'	16M	100M	6.0M	-	9,600
	16M	85M	5.0M	6,800	-
	16M	75M	5.0M	6,000	-
	16M	65M	5.0M	5,200	-
	16M	55M	5.0M	4,400	-
	16M	45M	5.0M	3,600	-
V YEAR EXCAVATION				30,800	9,600
TOTAL PRODUCTION FOR 5 YEARS				1,50,675	69,600

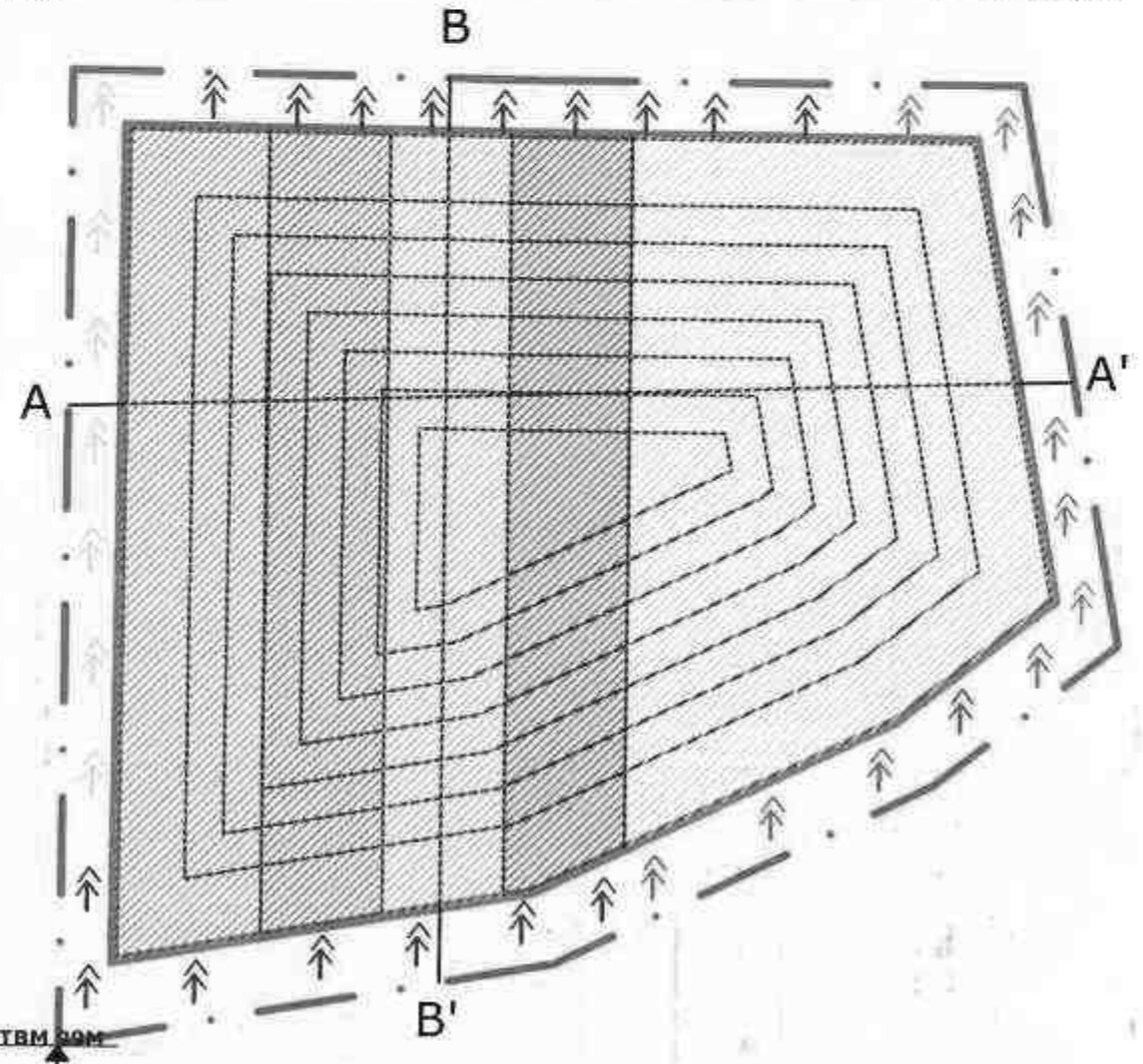
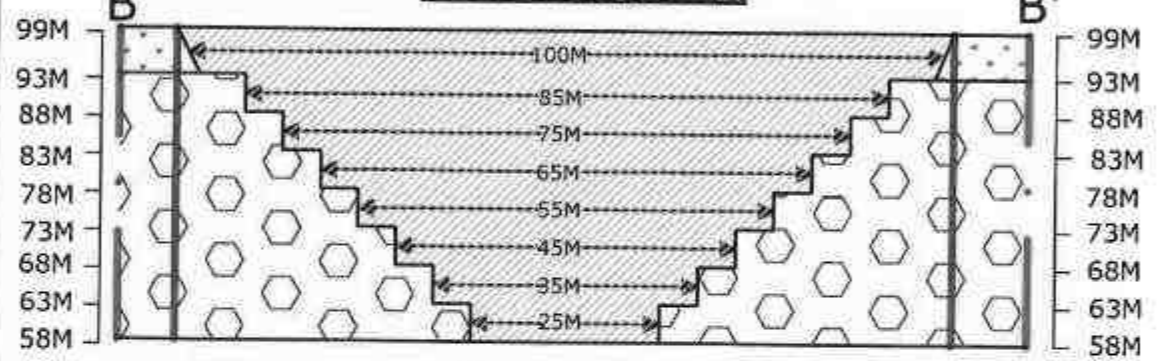
AFFORESTATION PROGRAMME FOR FIVE YEARS

YEAR	No OF TREES	TYPE OF TREES
I-YEAR	150	NEEM/PUNGAI
II-YEAR	150	NEEM/VAGAI
III-YEAR	150	NEEM/PUVARSU
IV-YEAR	150	NEEM/SAVUKKU
V-YEAR	150	NEEM/PUNGAI

SECTION ALONG A A'

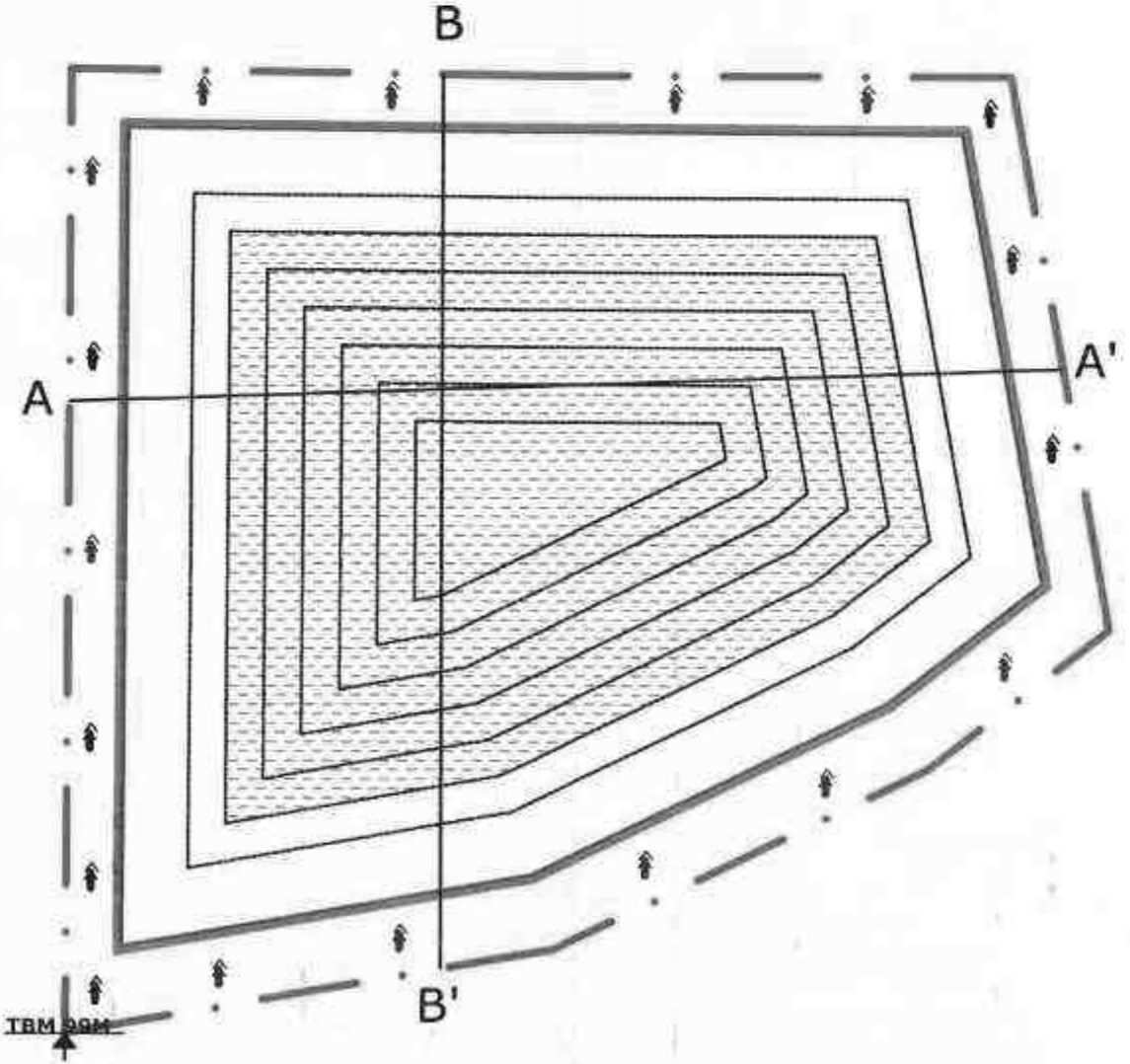
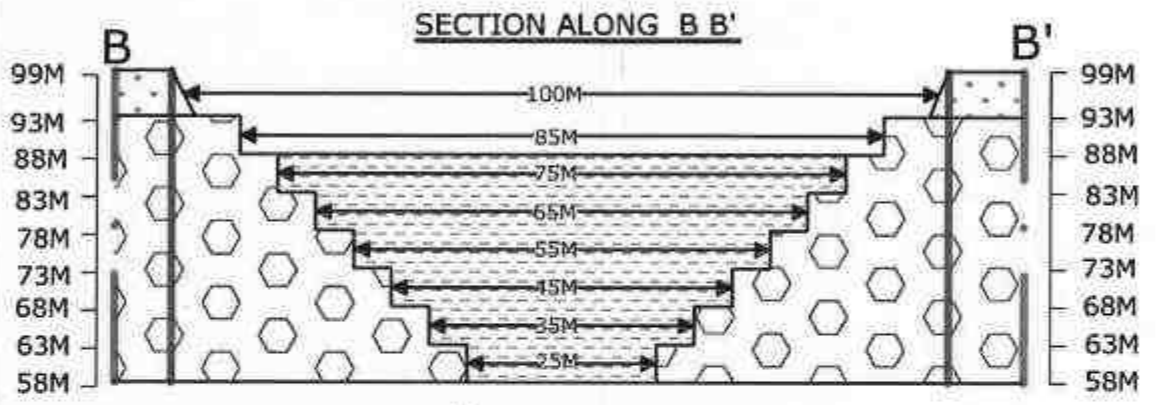
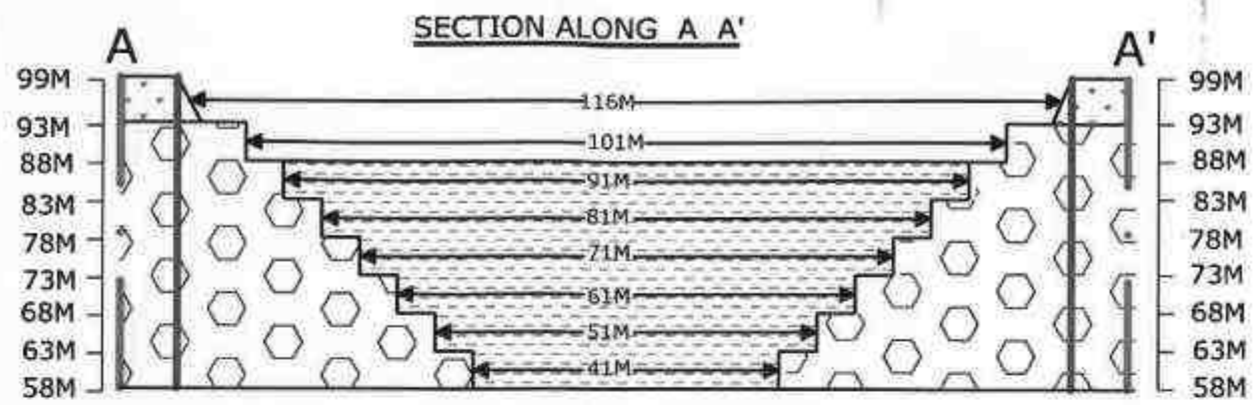


SECTION ALONG B B'



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64



ULTIMATE PIT SIZE

SECTION	LENGTH	WIDTH	DEPTH
A A'&B B'	116M	100M	41M

MINEABLE RESERVES

SECTION	LENGTH	WIDTH	DEPTH	CHORNOCKITE VOLUME M ³	TOP SOIL WITH GRAVEL VOLUME M ³
A A'&B B'	116M	100M	6.0M	-	69,600
	101M	85M	5.0M	42,925	-
	91M	75M	5.0M	34,125	-
	81M	65M	5.0M	26,325	-
	71M	55M	5.0M	19,525	-
	61M	45M	5.0M	13,725	-
	51M	35M	5.0M	8,925	-
	41M	25M	5.0M	5,125	-
TOTAL MINEABLE RESERVES				1,50,675	69,600

PLATE.VI

NAME OF THE APPLICANT:-
 THIRUMATHI.R.CHEMPAKA DEVI,
 W/O T.R.VARADARAJAN,
 No.1,RAMASAMY NAICKER STREET,
 VADUGARKOTTAI,
 ARUPPUKOTTAI TALUK-626 101,
 VIRUDHUNAGAR-DISTRICT.

LOCATION OF THE APPLIED AREA:-
 DISTRICT : VIRUDHUNAGAR
 TALUK : ARUPPUKOTTAI
 VILL.. NAME :SUNDAKOTTAI
 S.F.Nos. :44/1(P),5(P),6,7,8
 EXTENT :1.50.0 HECTARE

INDEX:-

- LEASE APPLIED AREA
- SAFETY DISTANCE
- TOP SOIL
- CHORNOCKITE
- BENCH MARK
- WATER RESERVOIR
- EARTH BUND
- PLANTATION

CONCEPTUAL PLAN AND SECTIONS
 SCALE :-1:1000

ALL PLANS AND SECTIONS ARE PREPARED BASED ON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

R. GURURAMACHANDRAN. M.Sc.
 Qualified Person
 (RQP/MAS/224/2010/A)

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106

65



NAME OF THE APPLICANT:
 THIRUMATHI.R.CHEMPAKA DEVI,
 W/O T.R.VARADARAJAN,
 No.1,RAMASAMY NAICKER STREET,
 VADUGARKOTTAI,
 ARUPPUKOTTAI TALUK-626 101,
 VIRUDHUNAGAR-DISTRICT.

LOCATION OF THE APPLIED AREA:-
 DISTRICT : VIRUDHUNAGAR
 TALUK : ARUPPUKOTTAI
 VILL.. NAME :SUNDAKOTTAI
 S.F.Nos: :44/1(P),5(P),6,7,8
 EXTENT :1.50.0 HECTARE

INDEX:-

APPLIED AREA	
SAFETY DISTANCE	
500M RADIUS	
300 M RADIUS	
WIND DIRECTION	
APPROCH ROAD	
ROAD	
ODAI	
KANMOI / URANI	

ENVIRONMENTAL PLAN
 SCALE :-1:5,000

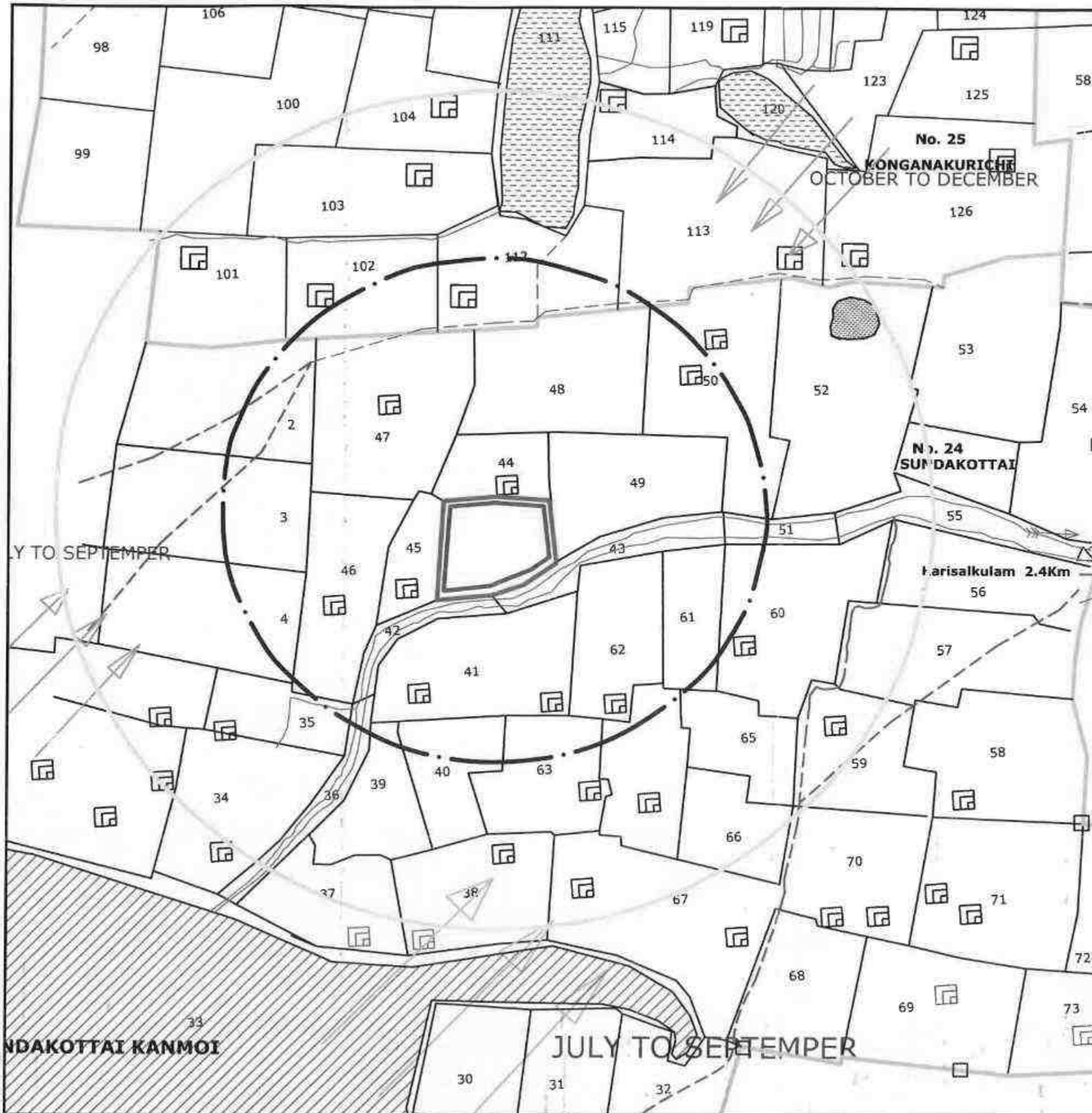
ALL PLANS AND SECTIONS ARE PREPARED BASED ON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

R. GURURAMACHANDRAN. M.Sc.,
 Qualified Person
 (RQP/MAS/224/2010/A)



Re 65/68 ⊗ K. Chempaka Devi

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66

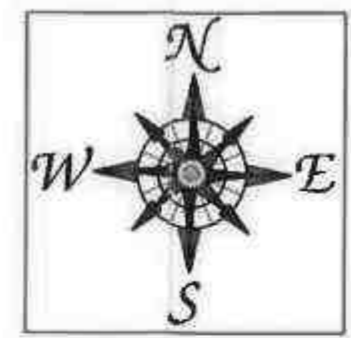


PLATE.VIIA

NAME OF THE APPLICANT:-
 THIRUMATHI.R.CHEMPAKA DEVI,
 W/O T.R.VARADARAJAN,
 No.1,RAMASAMY NAICKER STREET,
 VADUGARKOTTAI,
 ARUPPUKOTTAI TALUK-626 101,
 VIRUDHUNAGAR-DISTRICT.

LOCATION OF THE APPLIED AREA:-
 DISTRICT : VIRUDHUNAGAR
 TALUK : ARUPPUKOTTAI
 VILL.. NAME :SUNDAKOTTAI
 S.F.Nos. :44/1(P),5(P),6,7,8
 EXTENT :1.50.0 HECTARE

- APPLIED AREA
- 500M RADIUS
- 300 M RADIUS
- WIND DIRECTION
- APPROCH ROAD
- ROAD
- ADJACENT MINES
- ODAI
- SAFETY DISTANCE
- KANMOI / URANI
- VILLAGE BOUNDARY
- WELL

VILLAGE MAP SHOWING ENVIRONMENTAL FEATURES
 SCALE 1:5,000

ALL PLANS AND SECTIONS ARE PREPARED BASED ON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

R. GURURAMACHANDRAN. M.Sc.,
 Qualified Person
 (RQP/MAS/224/2010/A)

rc 66/68 P. Chempaka (w)



168

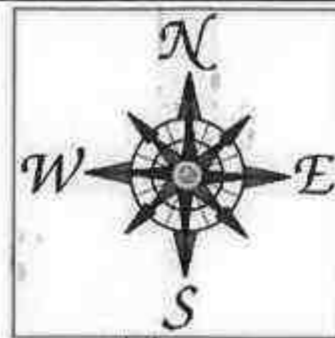
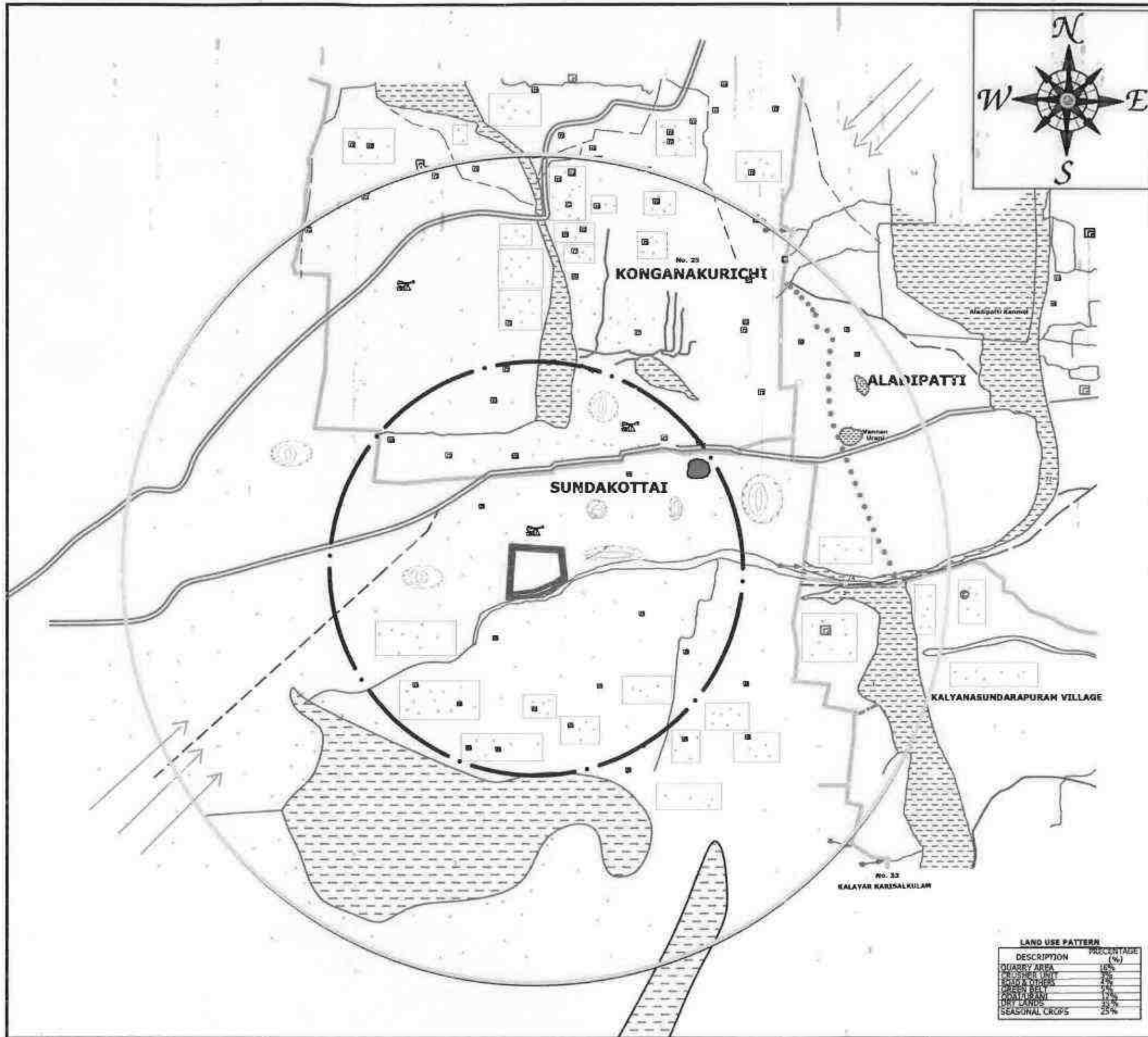


PLATE VIII

NAME OF THE APPLICANT:-
 THIRUMATHI.R.CHEMPAKA DEVI,
 W/O T.R.VARADARAJAN,
 No.1,RAMASAMY NAICKER STREET,
 VADUGARKOTTAI,
 ARUPPUKOTTAI TALUK-626 101,
 VIRUDHUNAGAR-DISTRICT.



LOCATION OF THE APPLIED AREA:-
 DISTRICT : VIRUDHUNAGAR
 TALUK : ARUPPUKOTTAI
 VILL.. NAME :SUNDAKOTTAI
 S.F.Nos. :44/1(P),5(P),6,7 & 8
 EXTENT :1.50.0 HECTARE

INDEX:-

- APPLIED AREA
- 1KM RADIUS
- 500 M RADIUS
- WIND DIRECTION
- CART TRACK
- ROAD
- ADJACENT MINES
- ODAI
- SAFETY DISTANCE
- KANMOI / URANI
- VILLAGE BOUNDARY
- WELL

**ENVIRONMENTAL AND
 LAND USE PLAN**

SCALE:-1:10,000

ALL PLANS AND SECTIONS ARE PREPARED BASED ON THE
 LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

R. Gururamachandran

R. GURURAMACHANDRAN, M.Sc.,
 Qualified Person
 (RQP/MAS/224/2010/A)

LAND USE PATTERN	
DESCRIPTION	PERCENTAGE (%)
QUARRY AREA	15%
PLANTATION	2%
FIELD & CROPS	2%
WATER BODY	1%
ROAD	1%
WELL	1%
SEASONAL CROPS	25%

RC 67/68 R. Chempaka Devi

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YEAR	No OF TREES	TYPE OF TREES
I-YEAR	150	NEEM TREES
II-YEAR	150	NEEM TREES
III-YEAR	150	NEEM TREES
IV-YEAR	150	NEEM TREES
V-YEAR	150	NEEM TREES

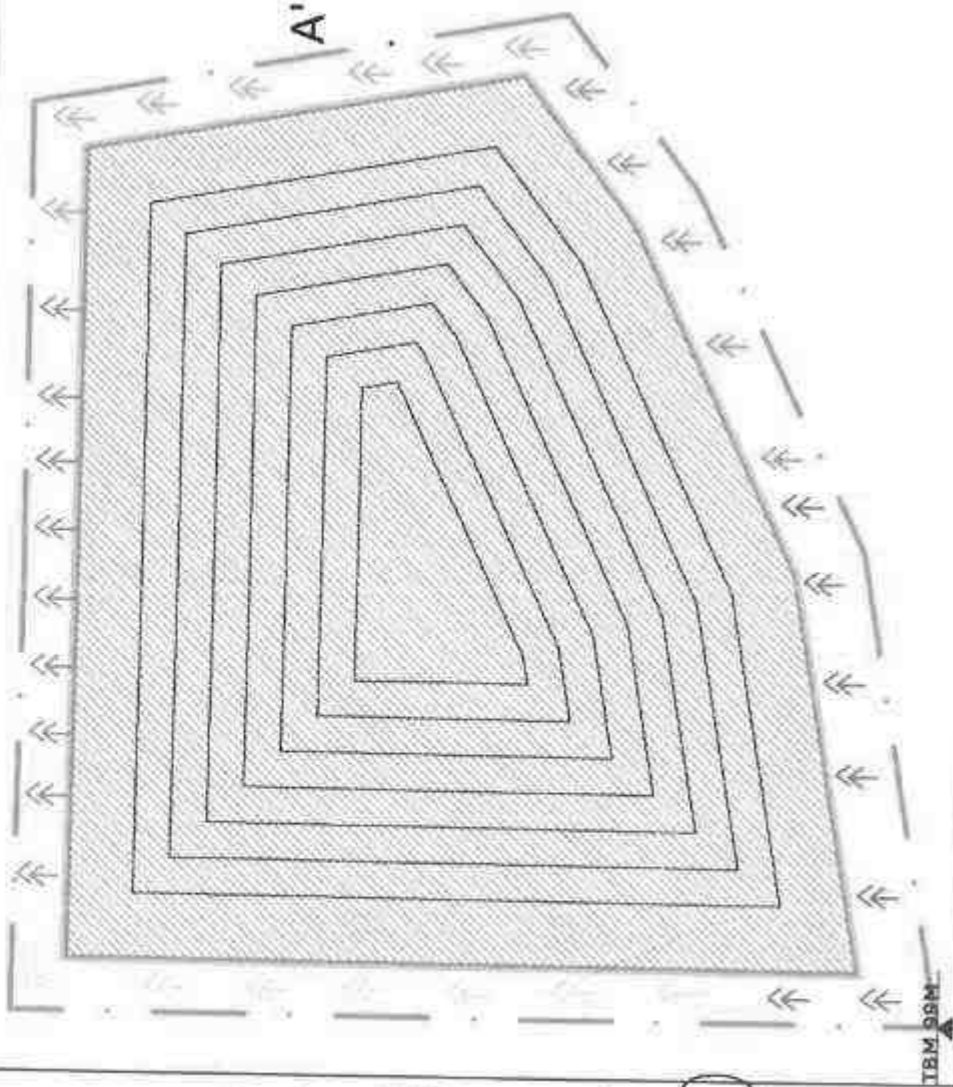
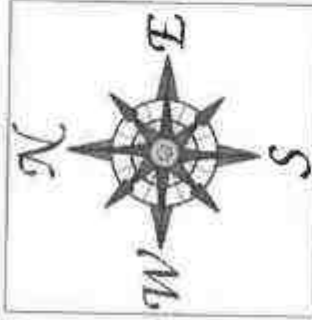
MINE CLOSURE PLAN WITH LAND USE PATTERN	
MINING / EXCAVATION	= 0.00.0 Ha
FUTURE MINING	= 0.86.5 Ha
INFRASTRUCTURE	= 0.01.0 Ha
STORAGE OF TOP SOIL	= 0.00.0 Ha
STOCKING & MINERAL DRESSING YARD	= 0.00.0 Ha
MINERALS	= 0.02.0 Ha
AFFORESTATION & SAFETY	= 0.60.5 Ha
UNDISTURBED AREA	= 0.00.0 Ha
TOTAL	= 1.50.0 Ha

PLATE.VIII

NAME OF THE APPLICANT:-
 THIRUMATHI.R.CHEMPAKA DEVI,
 W/O T.R.VARADARAJAN,
 No.1,RAMASAMY NAICKER STREET,
 VADUGARKOTTAI,
 ARUPPUKOTTAI TALUK-626 101,
 VIRUDHUNAGAR-DISTRICT.

LEGEND

- LEASE HOLD BOUNDARY
- TEMPORARY BENCH MARK
- LAYOUT OF MINE WORKING
- PROPOSED SITE SERVICES
- SAFETY DISTANCE
- EARTH BUND



PROGRESSIVE MINE CLOSURE PLAN

SCALE 1:1000

ALL DIMENSIONS AND SECTIONS ARE PREPARED BASED ON THE SURVEY DATA AND AUTHENTICATED BY STATE GOVERNMENT



R. GURURAMACHANDRAN, M.S.
 Qualified Person
 (RGP/MA/S/224120104)