

EXECUTIVE SUMMARY

PROJECT PROPONENT

Project Proponent	Proposed Project	Extent
THIRU. C. AMMAVASAI, S/o. Chinnaiah, No.564, Minnalkudi, Thirukolakudi, Kuruvikondanpatti Thiruppattur Taluk, Sivagangai District – 622 409	S.F.Nos. 118/4, 118/5, 118/6A & 119/3, Sevvur Village, Thiruppattur Taluk, Sivagangai District	0.98.0 ha
ToR obtained vide Lr No.SEIAA-TN/F.No.9938/ToR-1481/2023 Dated :22.06.2023.		

THIRU. C. AMMAVASAI ROUGH STONE QUARRY



“B1” CATEGORY – MINOR MINERAL – NON-FOREST LAND – PATTA LAND-CLUSTER

CLUSTER EXTENT = 7.52.5 ha

At

Sevvur Village, Thiruppattur Taluk, Sivagangai District, Tamil Nadu State

Complied as per Tor obtained for the Projects in Cluster Situation – Cluster area is calculated as per MoEF & CC Notification – S.O. 2269 (E) Dated: 01.07.2016

Environmental Consultant	Laboratory
 GEO EXPLORATION AND MINING SOLUTIONS Old No. 260-B, New No. 17, Advaitha Ashram Road, Alagapuram, Salem – 636 004, Tamil Nadu, India Accredited for sector 1 Category ‘A’31 & 38 Category ‘B’ Certificate No : NABET/EIA/2225/RA 0276 Phone: 0427-2431989, Email: ifthiahmed@gmail.com, geothangam@gmail.com Web: www.gemssalem.com	 CHENNAI METTEX LAB PRIVATE LIMITED, (ISO/IEC 17025:2017) No.83, M.K.N. Road, Jothi Complex, Guindy, Chennai – 600 032 Tamilnadu, INDIA.

BASELINE MONITORING SEASON – MARCH 2023 to MAY 2023

OCTOBER - 2023

1. INTRODUCTION

Environmental Impact Assessment (EIA) is the management tool to ensure the sustainable development and it is a process, used to identify the environmental, social and economic impacts of a project prior to decision-making. It is a decision-making tool, which guides the decision makers in taking appropriate decisions for any project. EIA systematically examines both beneficial and adverse consequences of the project and ensures that these impacts are taken into account during the project designing. It also reduces conflicts by promoting community participation, information, decision makers, and helps in developing the base for environmentally sound project.

Rough Stone is the major requirement for construction industry. This EIA Report is prepared for Thiru. C. Amavasai Rough stone quarry project Over an Extent of 0.98.0 Ha in S.F. No 118/4, 118/5, 118/6A & 119/3, Sevvur Village, Thiruppattur Taluk, Sivagangai District, Tamil Nadu State considering Cumulative impact from the Cluster quarries,

Cluster Quarries consisting of four (4) quarries total **Cluster extent of 7.52.5 ha**

- (1) Proposed quarry {0.98.0 ha},
- & (3) Existing quarries under operation {6.54.5 ha}
- (1) Abandoned quarry (0.68.0 Ha)

Total extent of Cluster of 7.52.5 Ha in Sevvur Village, Thiruppattur Taluk, Sivagangai District, Tamil Nadu, cluster area calculated as per MoEF & CC Notification S.O. 2269 (E) Dated 1st July 2016.

Initially the mining plan was prepared over an extent of 0.98.0 Ha in S.F.No 118/4, 118/5, 118/6A & 119/3, and the same has been approved. Proponent applied for Environmental Clearance in SEIAA, Tamil Nadu vide online proposal No SIA/TN/MIN/422613/2023 dated 13.03.2023. The proposal was placed in the 382nd SEAC Meeting and issued ToR vide Lr No.SEIAA-TN/F.No.9938/ToR-1481/2023 Dated :22.06.2023.

The Baseline Monitoring study has been carried out during summer season (March - May 2023) and this EIA and EMP report is prepared for considering cumulative impacts arising out of this project, the Cumulative Environmental Impact Assessment study is undertaken, which is followed by preparation of a detailed Environmental Management Plan (EMP) individually to minimize those adverse impacts.

“Draft EIA report prepared on the basis of ToR Issued for carrying out Public Hearing for the Grant of Environmental Clearance from SEIAA, - Tamil Nadu”

1.1 DETAILS OF PROJECT PROPONENT –

Name of the Project	Thiru. C. Amavasai, Rough Stone Quarry
Address	S/o. Chinnaiah, No.564, Minnalkudi, Thirukolakudi, Kuruvikondanpatti, Thiruppattur Taluk, Sivagangai District – 622 409,
Mobile	+91 95857 88845 & 63792 43729
Status	Individual
Email	suriyakanna4@gmail.com

1.2 QUARRY DETAILS WITHIN 500 M RADIUS

PROPOSED QUARRY				
CODE	Name of the Proponent and Address	S.F.Nos ,Village & Taluk	Extent in Ha	Status
P1	Thiru. C. Amavasai,	118/4, 118/5, 118/6A & 119/3 Sevvur Village	0.98.0	Tor Obtained Lr No.SEIAA- TN/F.No.9938/ToR-1481/2023 Dated :22.06.2023.
Total			0.98.0 Ha	
EXISTING QUARRIES				
CODE	Name of the Proponent and Address	S.F.Nos	Extent in Ha	Lease Period
E-1	Thiru.A.Selvam	113/4A,4B,3A,3B	1.69.0	08.09.2020 to

		etc		07.09.2025
E-2	Thiru.S.Vairavan	81/1, 2,3,4,5, etc	3.43.0	10.11.2020 to 09.11.2026
E-3	Thiru.R.M.Alagappan	116/3B, 116/3C, 116/3E & 116/3G	1.42.5	23.11.2021 to 22.11.2026
Total			6.54.5 Ha	
ABANDONED QUARRY				
A-1	Thiru.Arumugam	118/3	0.68.0	30.11.2005 to 29.11.2010
Total			0.68.0	
TOTAL CLUSTER EXTENT			7.52.5 Ha	

1.3 SALIENT FEATURES OF THE PROPOSAL

Name of the Mine	Thiru. C. Amavasai, Rough Stone Quarry		
Land Type	It is a Patta land – Non-Forest		
Land use classification	It is a Patta land, Registered in the name of the applicant (Thiru. C. Amavasai), vide Patta Nos. 901 & 916		
S.F. Nos	118/4, 118/5, 118/6A & 119/3		
Extent	0.98.0 ha		
Proposed depth of mining As per Mining plan	16m (1m Topsoil + 15m Rough Stone) below ground level		
Geological Resources in m ³	Rough Stone	Topsoil	
	1,47,000	9,800	
Mineable Reserves	Rough Stone	Topsoil	
	48,910	5,837	
Year wise production for Ten years	Rough Stone	Topsoil	
	48,910	5,837	
Mining Plan Period / Lease Period	10 Years		
Ultimate Pit Dimension	Pit I - 25m (L) x 94 m(W) x 16m (D) BGL Pit II - 133m (L) x 33 m(W) x 16m (D) BGL		
Toposheet No	58-J/12		
Latitude between	10° 14' 18.68" N to 10° 14' 24.49" N		
Longitude between	78° 35' 46.28" E to 78° 35' 50.35" E		
Topography	The lease applied area is exhibits plain terrain. The gradient is gentle towards South side and altitude of the area is 137m above from Mean Sea level. The area is covered by 1m thickness of Topsoil and followed by Massive Charnockite which is clearly inferred from the nearby existing quarry pits.		
Machinery proposed	Jack Hammer	2	
	Compressor	1	
	Excavator with Bucket and Rock Breaker	1	
	Tipper	1	
Blasting	Usage of Slurry Explosive with MSD detonators		
Manpower Deployment	15Nos		
Water table	64m Bgl		
Water Bodies	S.No	NAME	DISTANCE & DIRECTION
	1	Odai	100m West
	2	Tank	230m North
	3	Tank	420m NW
	4	Tank	570m SW
	5	Tank	680m SE

	6	Tank	7km West
	7	Tank	8.2km North
	8	Tank	9.2km East
Water requirements	2.0 KLD		
Total Project Cost	Project cost		Rs 19,82,000/-
	EMP Cost		Rs 7,60,000/-
	Total		Rs 27,42,000/-
Proposed CER Cost	Rs. 5,00,000/-		
Nearest Habitation	800m-NE		

Source: Approved Mining Plan

1.4 STATUTORY DETAILS

Project – P1

- ❖ The proponent applied for Rough Stone Quarry Lease Dated: 07.09.2022.
- ❖ Precise Area Communication Letter was issued by the Assistant Director / Deputy Director (i/c), Department of Geology and Mining, Sivagangai District vide Rc.No.714/Mines/2022, Dated: 29.12.2022
- ❖ The Mining Plan was prepared by Qualified Person and approved by Assistant Director / Deputy Director (i/c), Department of Geology and Mining, Sivagangai District vide Rc.No.714/Mines/2022, Dated: 02.02.2023
- ❖ Proponent applied for ToR for Environmental Clearance vides online Proposal No. SIA/TN/MIN/422613/2023, Dated:18.03.2023.
- ❖ The proposal was placed in 382nd SEAC meeting held on 09.06.2023 and the committee recommended for issue of ToR.
- ❖ The proposal was considered in 632nd SEIAA meeting held on 21.06.2023/22.06.2023 and issued ToR vide Lr No.SEIAA-TN/F.No.9938/ToR-1481/2023 Dated :22.06.2023

2. PROJECT DESCRIPTION

The proposed projects are site specific and there is no additional area required for this project. There is no effluent generation/discharge from the proposed quarries.

Method is mining is common for all the proposed quarries in the cluster. Rough Stone is proposed to be excavated by opencast mechanized method involving splitting of rock mass of considerable volume from the parent rock mass by jackhammer drilling and blasting, hydraulic excavators are used for loading the Rough Stone from pithead to the needy crushers and rock breakers to avoid secondary blasting.

2.1 SITE CONNECTIVITY TO THE PROJECT AREA

Nearest Roadway	Nearest National Highway – Tiruppattur to Dindigul (NH-383) – 11km – SW Nearest State Highway – Namasamudram to M. Kovilpatti Road (SH-201) – 6km – W
Nearest Village	Sevvur - 800m-NE
Nearest Town	Ponnamaravathi – 8.0km-NW
Nearest Railway	Tirumayam – 18.0km-E
Nearest Airport	Trichy – 58.0km – NE
Seaport	Thoothukudi 171km-SW

2.2 LAND USE PATTERN OF THE LEASE APPLIED AREA

Description	Present area (Ha)	Area required first five-year plan period (Ha)	At the end of lease period (Ha)
Quarry Pit	Nil	0.55.0	0.55.0
Infrastructure	Nil	0.01.0	0.01.0
Roads	Nil	0.02.0	0.02.0
Green Belt	Nil	0.12.0	0.22.0
Unutilized Area	0.98.0	0.28.0	0.18.0
Grand Total	0.98.0	0.98.0	0.98.0

2.3 OPERATIONAL DETAILS OF LEASE APPLIED AREA

PARTICULARS	DETAILS	
	Rough Stone (10Year Plan period)	Top soil (5 years)
Geological Resources	1,47,000	9,800
Mineable Reserves	48,910	5,837
Production for Ten-year plan period	48,910	5,837
Mining Plan Period	10Years	
Number of Working Days	300 Days	
Production per day	16	4
No of Lorry loads (6 m ³ per load)	3	1
Total Depth of Mining proposed as per Mining plan	16m (1m Topsoil + 15m Rough Stone) below ground level	

Source: Approved mining plan

2.4 RESOURCES AND RESERVES OF THE PROPOSAL

FIRST FIVE YEAR-WISE PRODUCTION PLAN

YEAR	ROUGH STONE (m ³)	Top soil (m ³)
I	5050	896
II	5280	704
III	4920	416
IV	5075	2240
V	4900	1581
TOTAL	25225	5837

NEXT FIVE YEAR-WISE PRODUCTION PLAN

YEAR	ROUGH STONE (m ³)	Top soil (m ³)
VI	5220	-
VII	4500	-
VIII	4625	-
IX	5520	-
X	3820	-
TOTAL	23685	-

FIGURE – 1: GOOGLE IMAGE SHOWING APPLIED QUARRY LEASE AREA – P1

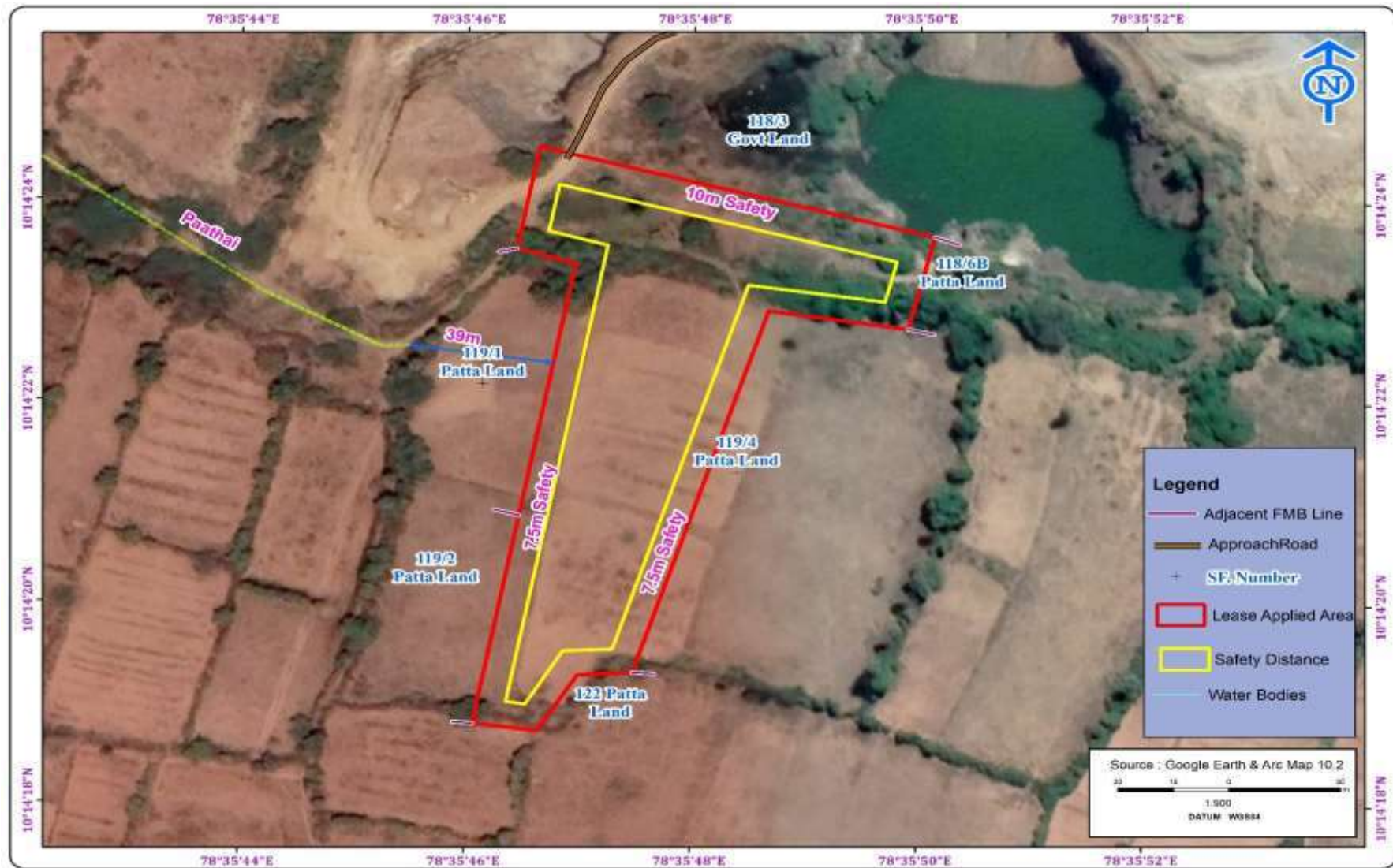


FIGURE – 2: GOOGLE IMAGE SHOWING CLUSTER (500 m QUARRIES)

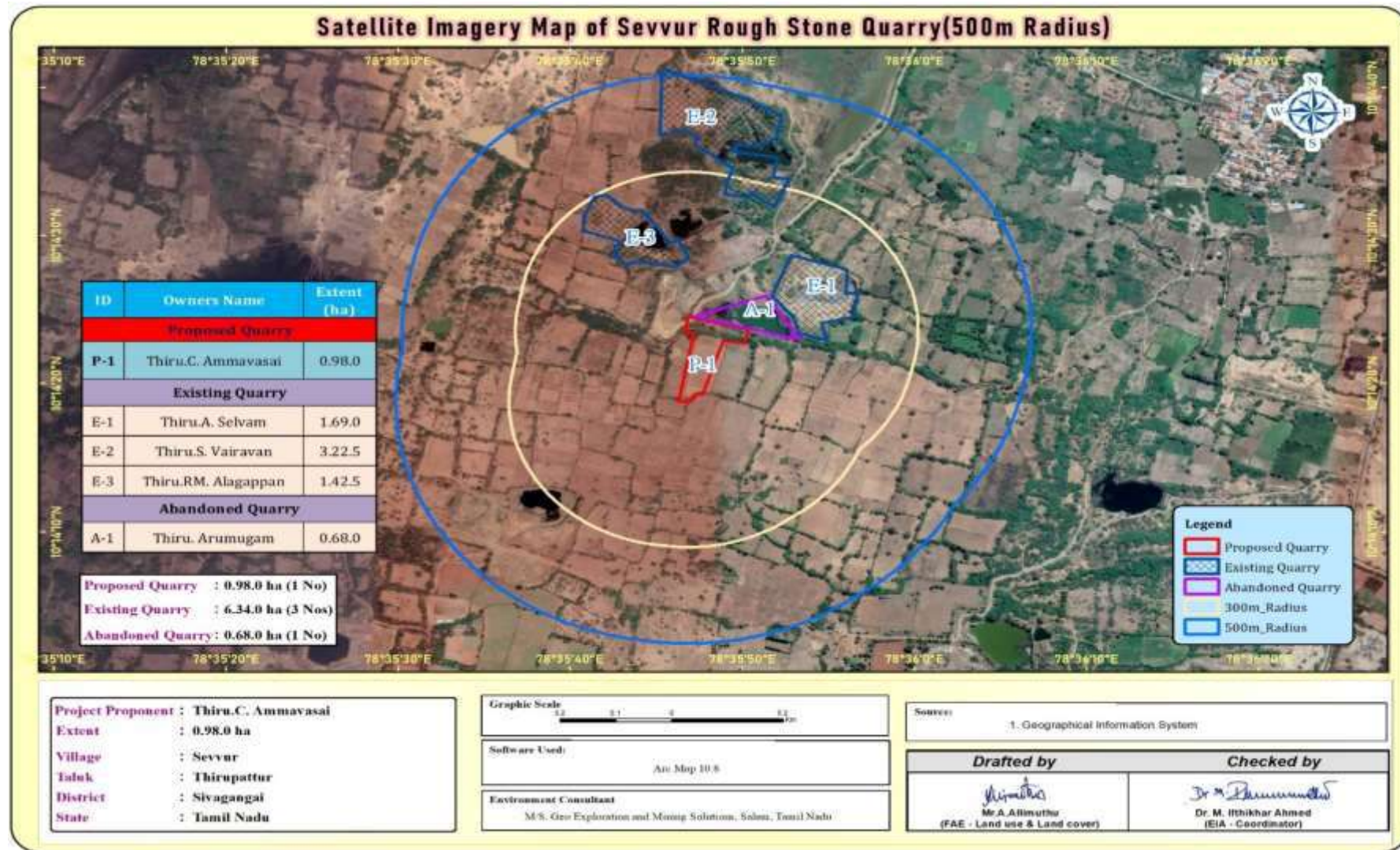
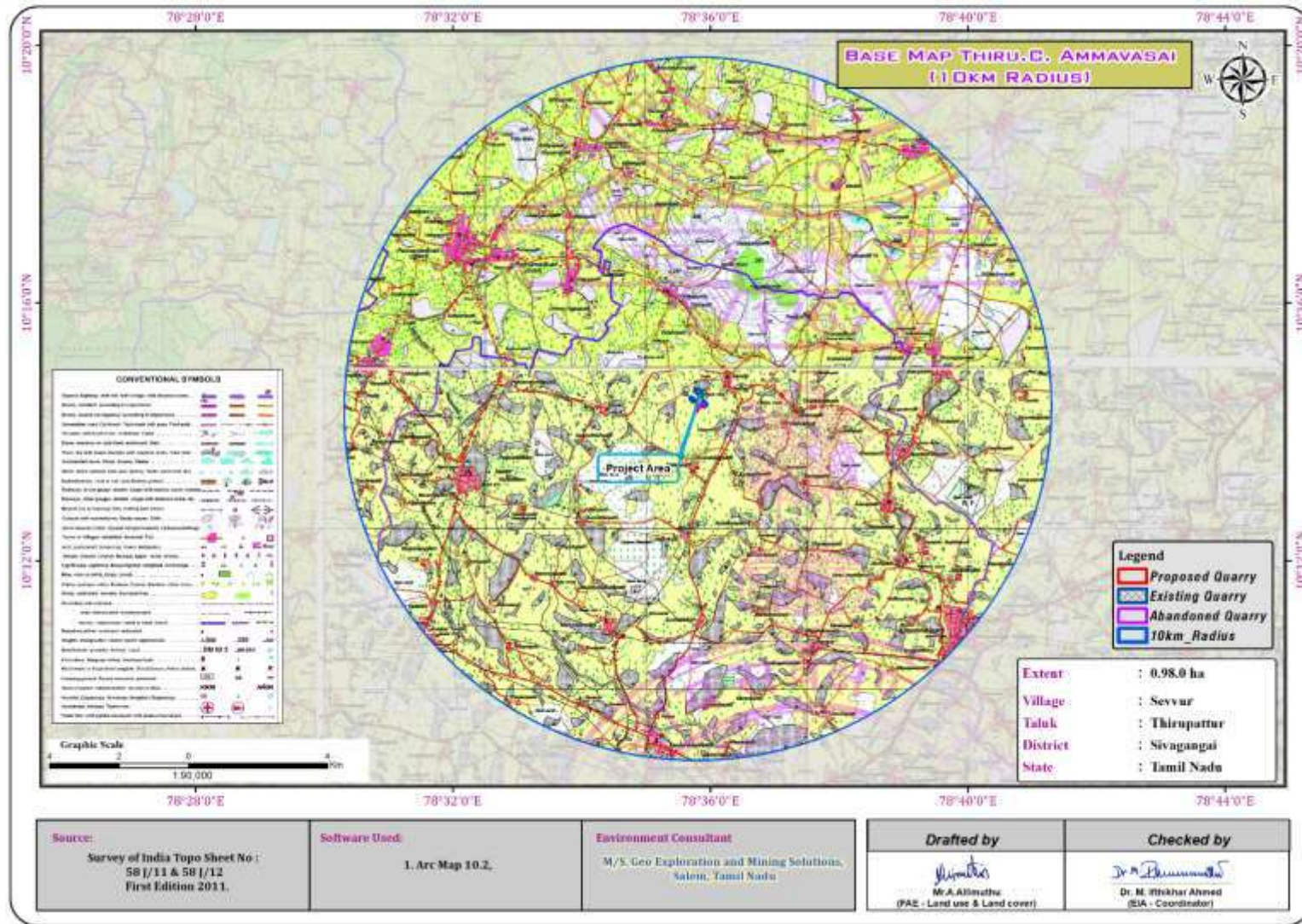


FIGURE – 3: TOPOSHEET MAP COVERING 10 KM RADIUS



2.5 METHOD OF MINING

Proposed Method of Mining is common for all the Proposed Projects – The method of mining is Opencast Mechanized Mining Method is being proposed by formation of 5.0 meter height bench with a bench width not less than the bench height.

The Rough Stone is a batholith formation and the splitting of rock mass of considerable volume from the parent rock mass will be carried out by deploying jackhammer drilling and Slurry Explosives will be used for blasting. Hydraulic Excavators attached with Rock Breakers unit will be deployed for breaking large boulders to required fragmented sizes to avoid secondary blasting and hydraulic excavators attached with bucket unit will be deployed for loading the Rough Stone into the tippers and then the stone is transported from pithead to the nearby crushers.

2.6 PROPOSED MACHINERY DEPLOYMENT

PROPOSAL – P1				
S.NO.	TYPE	NOS	SIZE/CAPACITY	MOTIVE POWER
1	Jack hammers	2	1.2m to 2.0m	Compressed air
2	Compressor	1	400psi	Diesel Drive
3	Excavator with Bucket / Rock Breaker	1	300 HP	Diesel Drive
4	Tippers	1	20 Tonnes	Diesel Drive

2.7 CONCEPTUAL MINING PLAN/ FINAL MINE CLOSURE PLAN

- ✚ At the end of life of mine, the excavated mine pit / void will act as artificial reservoir for collecting rain water and helps to meet out the demand or crises during drought season.
- ✚ After mine closure the greenbelt developed along the safety barrier and top benches and temporary water reservoir will enhance the ecosystem.
- ✚ Mine Closure is a process of returning a disturbed site to its natural state or which prepares it for other productive uses that prevents or minimizes any adverse effects on the environment or threats to human health and safety.
- ✚ The principle closure objectives are for rehabilitated mines to be physically safe to humans and animals, geo-technically stable, geo-chemically non-polluting/ non-contaminating, and capable of sustaining an agreed post-mining land use.

2.8 ULTIMATE PIT DIMENSION

Pit	Length (Max) (m)	Width (Max) (m)	Depth (Max) (m)
I	25	94	16
II	133	33	16

3. DESCRIPTION OF THE ENVIRONMENT

Field monitoring studies to evaluate the base line status of the project site were carried out during March to May 2023 as per CPCB guidelines. Environmental Monitoring data has been collected with reference to proposed mine Chennai Mettex Lab Private Limited, accredited by ISO/IEC-17025:2017 (NABL).

3.1 ENVIRONMENT MONITORING ATTRIBUTES

ATTRIBUTE	PARAMETERS	FREQUENCY OF MONITORING	NO. OF LOCATIONS	PROTOCOL
Land-use Land cover	Land-use Pattern within 10 km radius of the study area	Data's from census handbook 2011 and from the satellite imagery	Study Area	Satellite Imagery Primary Survey

Soil	Physio - Chemical Characteristics	Once during the study period	6 (1 core & 5 buffer zone)	IS 2720 Agriculture Handbook - Indian Council of Agriculture Research, New Delhi
Water quality	Physical, Chemical and Bacteriological Parameters	Once during the study period	6 (2 surface water & 4 ground water)	IS 10500 & CPCB Standards
Meteorology	Wind Speed Wind Direction Temperature Cloud cover Dry bulb temperature Rainfall	1 Hourly Continuous Mechanical/Automatic Weather Station	1	Site specific primary data & Secondary Data from IMD Station
Ambient Air Quality	PM ₁₀ PM _{2.5} SO ₂ , NO _x CO Fugitive Dust	24 hourly twice a week (March 2023– May 2023)	8 (1 core & 7 buffer)	IS 5182 Part 1-23 National Ambient Air Quality Standards, CPCB
Noise Levels	Ambient Noise	Hourly observation for 24 Hours per location	8 (1 core & 7 buffer zone)	IS 9989 As per CPCB Guidelines
Ecology	Existing Flora and Fauna	Through field visit during the study period	Study Area	Primary Survey by Quadrate & Transect Study & Secondary Data
Socio Economic Aspects	Socio–Economic Characteristics, Population Statistics and Existing Infrastructure in the study area	Site Visit & Census Handbook, 2011	Study Area	Primary Survey, census handbook & need based assessments.

3.2 LAND ENVIRONMENT

S.No	CLASSIFICATION	AREA_HA	AREA_%
BUILTUP			
1	URBAN	496.80	1.56
2	RURAL	721.34	2.26
3	MINING	54.00	0.17
AGRICULTURAL LAND			
4	CROP LAND	22351.35	69.98
5	PLANTATION	2303.07	7.21
BARREN/WASTE LANDS			
6	SCRUB LAND	1877.71	5.88
7	SALT AFFECTED LAND	326.57	1.02
WETLANDS/ WATER BODIES			
8	WATER BODIES/LAKE/RIVER	3806.92	11.92
TOTAL		31937.76	100.00

Interpretation:

Total area of land use is about 31937.76 Ha

Built-up area	=	1218.13 ha ie.,	3.82 %
Agriculture land	=	22351.35 ha ie.,	69.98 %
Plantation land	=	2303.07 ha i.e.	7.21%
Salt Affected Land	=	326.57 ha ie.,	1.02%
Mining area	=	54.00ha ie.,	0.17%
Water bodies	=	3806.92 ha ie.	11.92%
Scrub Land	=	1877.71	5.88%

Cluster of quarries within 500m radius is 7.52.5 ha of the total Mining areas within the study area. This small percentage of Mining Activities shall not have any significant impact on the environment.

3.3 SOIL ENVIRONMENT

Interpretation & Conclusion

Physical Characteristics –

The physical properties of the soil samples were examined for texture, bulk density, porosity and water holding capacity. The soil texture found in the study area is Clay to Sandy Soil and Bulk Density of Soils in the study area varied between 0.94 – 1.10 g/cc. The Water Holding Capacity is 46.1% to 48.5% and Porosity of the soil samples is found to be medium i.e. ranging from 41.4 – 48.0 %.

Chemical Characteristics –

- The nature of soil is slightly alkaline to strongly alkaline in nature with pH range 7.69 to 8.98
- The available Nitrogen content range between 374.1 mg/kg -530 mg/kg
- The available Phosphorus content range between 1.06 mg/kg to 2.8 mg/kg
- The available Potassium range between 18.2mg/kg to 65.5 mg/kg

Whereas, the micronutrient as zinc (Zn), iron (Fe) and copper (Cu) were found in the range of 1.64mg/kg to 4.4 mg/kg, 1.86 mg/kg to 17.2 mg/kg and ND

Wilting co efficient in significant level would mean that the soil would support the vegetation. The soil properties in the buffer zone reveal that the soil can sustain vegetation. If amended suitability the core area can also withstand plantation.

3.4 WATER ENVIRONMENT

Surface Water

The pH of surface 7.02-7.55 while turbidity found within the standards. Total Dissolved Solids 455-621mg/l and Chloride 80.6-135.5 mg/l. Nitrates 11.5-17.2 mg/l, while sulphates 57.5-76.1mg/l.

Ground Water

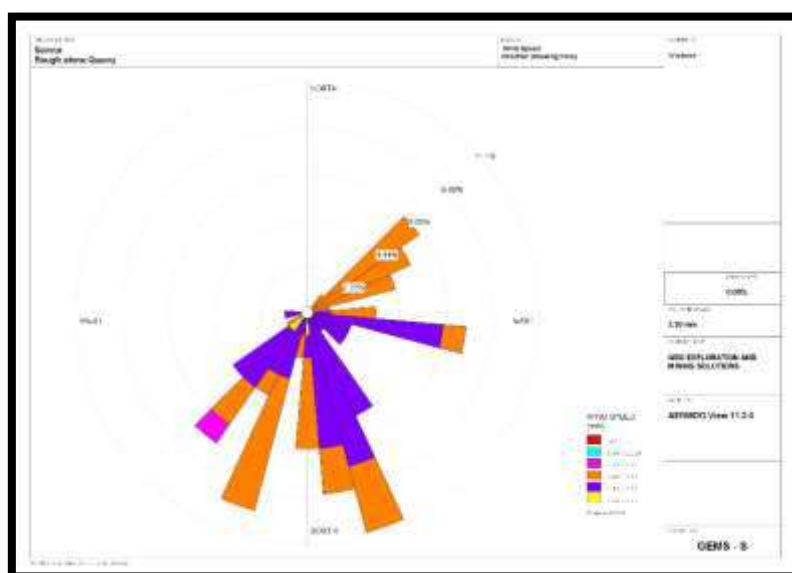
The pH of the water samples collected ranged from 7.06 to 7.97 and within the acceptable limit of 6.5 to 8.5. pH, Sulphates and Chlorides of water samples from all the sources are within the limits as per the Standard. on Turbidity, the water samples meet the requirement. Total Dissolved Solids were found in the range of 490 - 710mg/l in all samples. Total hardness varied between 154.04 mg/l – 234.3 mg/l for all samples.

On Microbiological parameters, the water samples from all the locations meet the requirement. The parameters thus analysed were compared with IS 10500:2012 and are well within the prescribed limits.

3.5 AIR ENVIRONMENT

The baseline studies on air environment include identification of specific air pollution parameters and their existing levels in ambient air. The ambient air quality with respect to the study zone of 10 km radius around the proposed quarry forms the baseline information.

FIGURE – 4: WIND ROSE DIAGRAM



As per monitoring data, PM₁₀ ranges from 38 µg/m³ to 48.9 µg/m³, PM_{2.5} data ranges from 18.4 µg/m³ to 24.8 µg/m³, SO₂ ranges from 4.1 µg/m³ to 9.9µg/m³ and NO_x data ranges from 19.2 µg/m³ to 27.6 µg/m³. The concentration levels of the above criteria pollutants were observed to be well within the limits of NAAQS prescribed by CPCB.

The minimum & maximum concentrations of PM₁₀ were found to be 38.0 µg/m³ in Vagupatti village & 48.9 µg/m³ in Thirukolakudi Village respectively. The minimum & maximum concentrations of PM_{2.5} were found to be 18.4 µg/m³ in Chandiranpatti village & 24.8 µg/m³ in Core zone area respectively. The maximum concentration in the core zone is due to the cluster of quarries situated within 500m radius.

3.6 NOISE ENVIRONMENT

Ambient noise levels were measured at 8 (Eight) locations around the project area considering cluster quarries. Noise levels recorded in core zone during day time were from 42.3 dB (A) Leq and during night time were from 35.0 dB (A) Leq. Noise levels recorded in buffer zone during day time were from 38.5– 41.9 dB (A) Leq and during night time were from 35.2– 38.7 dB (A) Leq.

The values of noise observed in some of the areas are primarily owing to quarrying activities due to cluster of quarries within 500m radius, movement of vehicles and other anthropogenic activities. Noise

monitoring results reveal that the maximum & minimum noise levels at day time were recorded in the range of 49.7dB(A) in Sevoor Village and 31.2 dB(A) in Near Existing quarry and Kunnathanpatti Village respectively. 43.6 dB(A) in Sevoor Village & 31.3 dB(A) in Core zone, Chandiranpatti, Sevoor and Vegupatti Villages respectively in night time. Thus, the noise level for Industrial and Residential area meets the requirements of CPCB.

3.7 ECOLOGICAL ENVIRONMENT

The study involved in the collection of primary data by conducting a survey in the field, examination of floral and faunal records in previously published reports and records. Analysis of the information is the view of the possible alteration in the environment of the project site. For the survey of fauna, both direct and indirect observation methods were used.

There is no schedule I species of animals observed within study area as per Wildlife Protection Act 1972 as well as no species is in vulnerable, endangered or threatened category as per IUCN. There is no endangered red list species found in the study area. Hence this small operation over short period of time will not have any significant impact on the surrounding flora and fauna.

3.8 SOCIO ECONOMIC ENVIRONMENT

It includes demographic structure of the area, provision of basic amenities viz., housing, education, health and medical services, occupation, water supply, sanitation, communication, transportation, prevailing diseases pattern as well as feature like temples, historical monuments etc., at the baseline level. This will help in visualizing and predicting the possible impact depending upon the nature and magnitude of the project.

The socio-economic study of surveyed villages gives a clear picture of its population, average household size, literacy rate and sex ratio etc. It is also found that a part of population is suffering from lack of permanent job to run their day-to-day life. Their expectation is to earn some income for their sustainability on a long-term basis.

The proposed projects will aim to provide preferential employment to the local people there by improving the employment opportunity in the area and in turn the social standards will improve.

4. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES – IN COMMON FOR PROPOSED QUARRY

In order to maintain the environmental commensuration with the mining operation, it is essential to undertake studies on the existing environmental scenario and assess the impact on different environmental components. This would help in formulating suitable management plans sustainable resource extraction.

4.1 LAND ENVIRONMENT:

ANTICIPATED IMPACT

- Permanent or temporary change on land use and land cover.
- Change in Topography: Topography of the ML area will change at the end of the life of the mine.
- Movement of heavy vehicles sometimes cause problems to agricultural land, human habitations due to dust, noise and it also causes traffic hazards.
- Due to degradation of land by pitting the aesthetic environment of the core zone may be affected.
- Earthworks during the rainy season increase the potential for soil erosion and sediment laden water entering the water ways.
- If no due care is taken wash off from the exposed working area may choke the water course & can also causes the siltation of water course

MITIGATION MEASURES

- The mining activity will be gradual confined in blocks and excavation will be undertaken progressively along with other mitigative measures like phase wise development of greenbelt etc.
- Construction of garland drains all around the quarry pits and construction of check dam at strategic location in lower elevations to prevent soil erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area

- Green belt development along the boundary within safety zone. The small quantity of water stored in the mined-out pit will be used for greenbelt
- Thick plantation will be carried out on unutilized area, top benches of mined out pits, on safety barrier, etc.,
- At conceptual stage, the land use pattern of the quarry will be changed into Greenbelt area and temporary reservoir
- In terms of aesthetics, natural vegetation surrounding the quarry will be retained (such as in a buffer area i.e., 7.5 m safety barrier and other safety provided) so as to help minimise dust emissions.
- Proper fencing will be carried out at the conceptual stage, Security will be posted round the clock, to prevent inherent entry of the public and cattle

4.2 WATER ENVIRONMENT

ANTICIPATED IMPACT

- The major sources of water pollution normally associated due to mining and allied operations are:
 - Generation of waste water from vehicle washing.
 - Washouts from surface exposure or working areas
 - Domestic sewage
 - Disturbance to drainage course in the project area
 - Mine Pit water discharge
- Increase in sediment load during monsoon in downstream of lease area
- This being a mining project, there will be no process effluent. Waste from washing of machinery may result in discharge of Oil & grease, suspended solids.
- The sewage from soak pit may percolate to the ground water table and contaminate it.
- Surface drainage may be affected due to Mining
- Abstraction of water may lead to depletion of water table

MITIGATION MEASURES

- Garland drains, settling tank will be constructed along the individual mining leases. The Garland drains of the individual leases will be connected to settling tank and after settling the water will be discharged out to the natural drainage
- Rainwater will be collected in sump in the mining pits and will be allowed to store and pumped out to surface setting tank of 15 m x 10m x 3m to remove suspended solids if any. This collected water will be judiciously used for dust suppression onwards and such sites where dust likely to be generated and for developing green belt. The proponent will collect and judiciously utilize the rainwater as part of rainwater harvesting
- Providing benches with inner slopes and through a system of drains and channels, allowing rain water to descent into surrounding drains, so as to minimize the effects of erosion & water logging arising out of uncontrolled descent of water.
- Reuse the water collected during storm for dust suppression and greenbelt development within the mines
- Installing interceptor traps/oil separators to remove oils and greases. Water from the tipper wash-down facility and machinery maintenance yard will pass through interceptor traps/oil separators prior to its reuse;
- Using flocculating or coagulating agents to assist in the settling of suspended solids during monsoon seasons.
- Periodic analysis of quarry pit water and ground water quality in nearby villages
- Domestic sewage from site office & urinals/latrines provided in ML is discharged in septic tank followed by soak pits
- Waste water discharge from mine will be treated in settling tanks before using for dust suppression and tree plantation purposes
- De-silting will be carried out before and immediately after the monsoon season

- Regular monitoring and analysing the quality of water in open well, bore wells and surface water.

4.3 AIR ENVIRONMENT

ANTICIPATED IMPACT

- During mining, at various stages activities such as excavation, drilling, blasting, and transportation of materials, particular matter (PM), gases such as Sulphur dioxide, oxides of Nitrogen from vehicular exhaust are the main air pollutants.
- Emissions of noxious gases due to incomplete detonation of explosive may sometimes pollute the air.
- The fugitive dust released from the mining operations may cause effect on the mine workers who are directly exposed to the fugitive dust.
- Simultaneously, the air-borne dust may travel to longer distances and settle in the villages located near the mine lease area.

MITIGATION MEASURES

Drilling – To control dust at source, wet drilling will be practiced. Where there is a scarcity of water, suitably designed dust extractor will be provided for dry drilling along with dust hood at the mouth of the drill-hole collar.

Advantages of Wet Drilling: -

- In this system dust gets suppressed close to its formation. Dust suppression become very effective and the work environment will be improved from the point of occupational comfort and health.
- Due to dust free atmosphere, the life of engine, compressor etc., will be increased.
- The life of drill bit will be increased.
- The rate of penetration of drill will be increased.
- Due to the dust free atmosphere visibility will be improved resulting in safer working conditions.

Blasting –

- Establish time of blasting to suit the local conditions and water sprinkling on blasting face
- Avoid blasting i.e., when temperature inversion is likely to occur and strong wind blows towards residential areas
- Controlled blasting includes Adoption of suitable explosive charge and short delay detonators, adequate stemming of holes at collar zone and restricting blasting to a particular time of the day i.e., at the time lunch hours, controlled charge per hole as well as charge per round of hole
- Before loading of material water will be sprayed on blasted material
- Dust mask will be provided to the workers and their use will be strictly monitored.

Haul Road & Transportation –

- Water will be sprinkled on haul roads twice a day to avoid dust generation during transportation
- Transportation of material will be carried out during day time and material will be covered with tarpaulin
- The speed of tippers plying on the haul road will be limited below 20 km/hr to avoid generation of dust.
- Water sprinkling on haul roads & loading points will be carried out twice a day
- Main source of gaseous pollution will be from vehicle used for transportation of mineral; therefore weekly maintenance of machines improves combustion process & makes reduction in the pollution.
- The un-metalled haul roads will be compacted weekly before being put into use.
- Over loading of tippers will be avoided to prevent spillage.
- It will be ensured that all transportation vehicles carry a valid PUC certificate
- Grading of haul roads and service roads to clear accumulation of loose materials

Green Belt –

- Planting of trees all along main mine haul roads and regular grading of haul roads will be practiced to prevent the generation of dust due to movement of dumpers/trucks
- Green belt of adequate width will be developed around the project areas

Occupational Health –

- Dust mask will be provided to the workers and their use will be strictly monitored
- Annual medical check-ups, trainings and campaigns will be arranged to ensure awareness about importance of wearing dust masks among all mine workers & tipper drivers
- Ambient Air Quality Monitoring will be conducted six months once to assess effectiveness of mitigation measures proposed.

4.4 NOISE ENVIRONMENT

ANTICIPATED IMPACT

Noise pollution poses a major health risk to the mine workers. Following are the sources of noise in the existing open cast mine project are being observed such as Drilling, & Blasting, Loading and during movement of vehicles.

MITIGATION MEASURES

- Usage of sharp drill bits while drilling which will help in reducing noise;
- Secondary blasting will be totally avoided and hydraulic rock breaker will be used for breaking boulders;
- Controlled blasting with proper spacing, burden, stemming and optimum charge/delay will be maintained;
- The blasting will be carried out during favourable atmospheric condition and less human activity timings by using nonelectrical initiation system;
- Proper maintenance, oiling and greasing of machines will be done every week to reduce generation of noise;
- Provision of sound insulated chambers for the workers working on machines (HEMM) producing higher levels of noise;
- Silencers / mufflers will be installed in all machineries;
- Green Belt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise;
- Personal Protective Equipment (PPE) like ear muffs/ear plugs will be provided to the operators of HEMM and persons working near HEMM and their use will be ensured through training and awareness.
- Regular medical check-up and proper training to personnel to create awareness about adverse noise level effects.

4.5 BIOLOGICAL ENVIRONMENT

ANTICIPATED IMPACT

There are no National Park and Archaeological monuments within project area. There are no migratory corridors, migratory avian-fauna, rare endemic and endangered species. There are no wild animals in the area. No breeding and nesting site were identified in project site. No National Park and Wildlife Sanctuary found within 10km radius. The dumps / bunds around the mine itself act as a good barrier for entry of stray animals. In the post mining stage, barbed wire fencing is proposed all around the mined-out void to prevent fall of animals in the mine pits.

MITIGATION MEASURES

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

4.5.1 GREENBELT DEVELOPMENT PLAN

Year	No. of trees proposed to be planted	Survial %	Area to be planted	Name of the species
I	It is proposed to plant 490 Nos of trees in the 1 st year	80%	Safety barrier, Un utilized area's and nearby village roads	Neem, Pongamia,Pinnata, Cauarina etc.,

4.6 SOCIO ECONOMIC ENVIRONMENT

ANTICIPATED IMPACT

Employment generation due to the project will provide direct employment for about 24persons.

MITIGATION MEASURES

- Good maintenance practices will be adopted for plant machinery and equipment, which will help to avert potential noise problems.
- Green belt will be developed in and around the project site as per Central Pollution Control Board (CPCB) guidelines.
- Appropriate air pollution control measure will be taken to minimize the environmental impact within the core zone.
- For the safety of workers, personal protective appliances like hand gloves, helmets, safety shoes, goggles, aprons, nose masks and ear protecting devices will be provided as per mines act and rules.
- Benefit to the State and the Central governments through financial revenues by way of royalty, tax, DMF, NMET etc, from this project directly and indirectly.

5. ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

The site has been selected based on geological investigation and exploration as below:

- Occurrence of minerals at the specific site.
- Transportation facility for materials & manpower.
- Overall impact on environment and mitigation feasibility
- Socio – economic background.

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

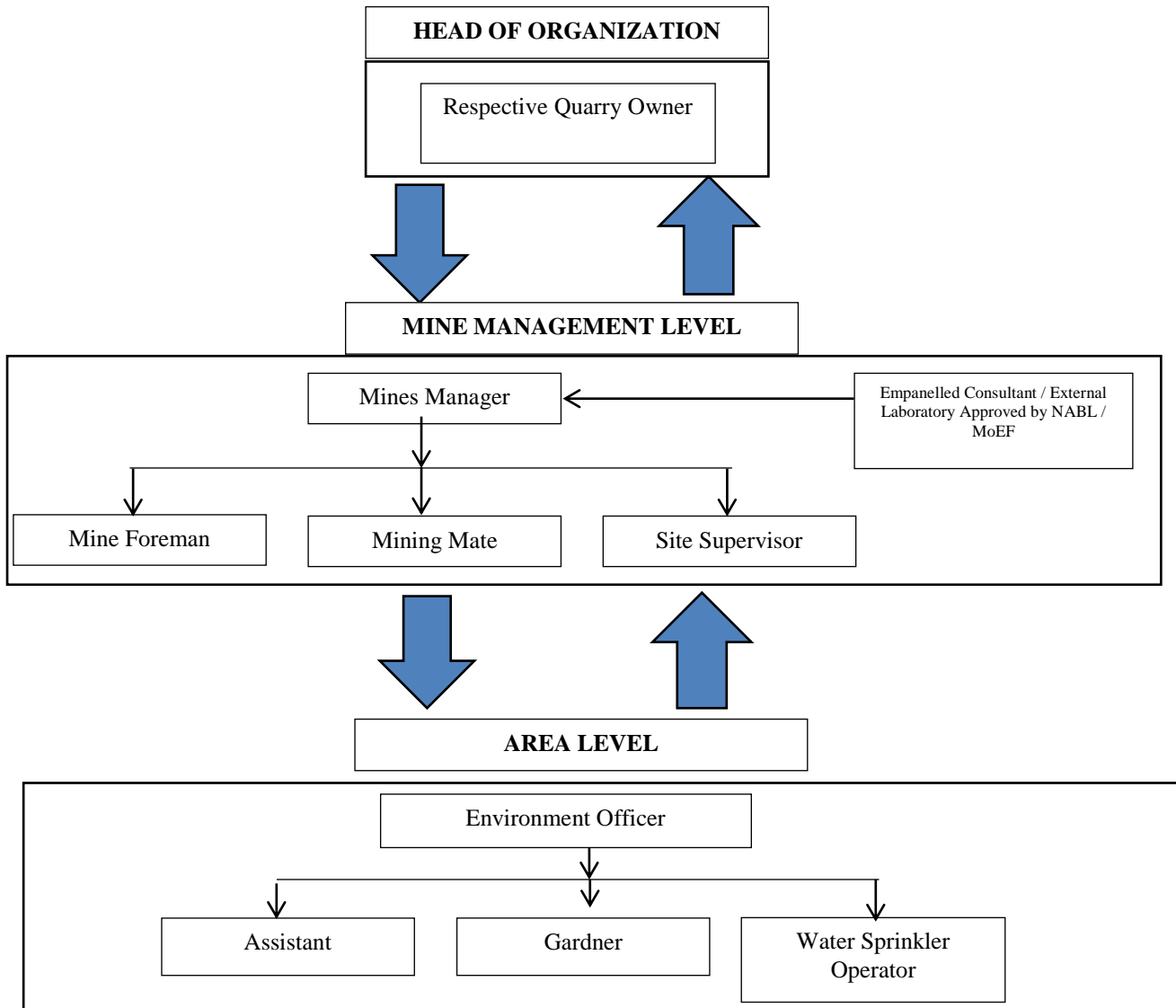
6. ENVIRONMENT MONITORING PROGRAM

Usually, an impact assessment study is carried over short period of time and the data cannot bring out all variations induced by natural or human activities. Hence regular monitoring program of Environmental parameters is essential to take into account the changes in the Environment.

The Objective of Monitoring -

- ✚ To check or assess the efficiency of the controlling measures;
- ✚ To establish a data base for future impact assessment studies.

6.1 ENVIRONMENTAL MONITORING CELL



6.2 POST ENVIRONMENTAL CLEARANCE MONITORING SCHEDULE

IN COMMON FOR PROPOSAL QUARRY					
S. No.	Environment Attributes	Location	Monitoring		Parameters
			Duration	Frequency	
1	Air Quality	2 Locations (1 Core & 1 Buffer)	24 hours	Once in 6 months	Fugitive Dust, PM _{2.5} , PM ₁₀ , SO ₂ and NO _x .
2	Meteorology	At mine site before start of Air Quality Monitoring & IMD Secondary Data	Hourly / Daily	Continuous online monitoring	Wind speed, Wind direction, Temperature, Relative humidity and Rainfall
3	Water Quality Monitoring	2 Locations (1SW & 1 GW)	-	Once in 6 months	Parameters specified under IS:10500, 1993 & CPCB Norms
4	Hydrology	Water level in open wells in buffer zone around 1 km at specific wells	-	Once in 6 months	Depth in bgl
5	Noise	2 Locations (1 Core & 1 Buffer)	Hourly – 1 Day	Once in 6 months	Leq, Lmax, Lmin, Leq Day & Leq Night
6	Vibration	At the nearest habitation (in case of reporting)	-	During blasting Operation	Peak Particle Velocity
7	Soil	2 Locations (1 Core & 1 Buffer)	-	Once in six months	Physical and Chemical Characteristics
8	Greenbelt	Within the Project Area	Daily	Monthly	Maintenance

7. ADDITIONAL STUDIES

7.1 RISK ASSESSMENT FOR PROPOSAL QUARRY

The methodology for the risk assessment has been based on the specific risk assessment guidance issued by the Directorate General of Mine Safety (DGMS), Dhanbad, vide Circular No.13 of 2002, dated 31st December, 2002. The DGMS risk assessment process is intended to identify existing and probable hazards in the work environment and all operations and assess the risk levels of those hazards in order to prioritize those that need immediate attention. Further, mechanisms responsible for these hazards are identified and their control measures, set to timetable are recorded along with pinpointed responsibilities.

The whole quarry operation will be carried out under the direction of a Qualified Competent Mine Manager holding certificate of competency to manage a metalliferous mine granted by the DGMS, Dhanbad. Risk Assessment is all about prevention of accidents and to take necessary steps to prevent it from happening.

7.2 DISASTER MANAGEMENT PLAN FOR PROPOSAL QUARRY

The Disaster Management Plan is aimed to ensure safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities. The objective of the Disaster Management Plan is to make use of the combined resources of the mine and the outside services to achieve the following:

- ✚ Rescue and medical treatment of casualties;
- ✚ Safeguard other people;
- ✚ Minimize damage to property and the environment;
- ✚ Initially contain and ultimately bring the incident under control;
- ✚ Secure the safe rehabilitation of affected area; and
- ✚ Preserve relevant records and equipment for the subsequent inquiry into the cause and circumstances of the emergency

7.3 CUMULATIVE IMPACT STUDY

CUMULATIVE PRODUCTION LOAD OF ROUGH STONE

PROPOSED QUARRY				
Quarry	Production for 10year plan period considering safety parameters m ³	Per Year Production in m ³	Per Day Production in m ³	Number of Lorry Load Per Day @ 6m ³ per load
P1	48,910	4891	16	3Trips /Day
TOTAL	48,910	4,891	16	3Trips /Day
EXISTING QUARRIES				
Quarry	Production for five-year plan period	Per Year Production in m ³	Per Day Production in m ³	Number of Lorry Load Per Day @ 6m ³ per load
E1	1,70,805	34,161	114	19 Trips /Day
E2	1,64,275	32,855	110	18 Trips /Day
E3	1,53,705	30,741	102	17 Trips /Day
TOTAL	4,88,785	97,757	326	54 Trips/ Day
Grant Total	5,37,695	1,02,648	342	57 Trips/ Day

CUMULATIVE PRODUCTION LOAD OF TOPSOIL

PROPOSED QUARRY				
Quarry	Production for five-year plan period considering safety parameters m ³	Per Year Production in m ³	Per Day Production in m ³	Number of Lorry Load Per Day @ 6m ³ per load
P1	5,837	1167	4	1- Trips /week
EXISTING QUARRIES				
Quarry	Production for five-year and three year plan period	Per Year Production in m ³	Per Day Production in m ³	Number of Lorry Load Per Day @ 6m ³ per load
E1	22,407	4481	15	2- Trips /week
E2	23,220	7,740	26	4- Trips /week
E3	4,745	1582	5	1- Trips /week
TOTAL	50,372	13,803	20	7- Trips/ Day
G.Total	56,209	14,970	24	8- Trips/ Day

SOCIO ECONOMIC BENEFITS FROM CLUSTER

Proposed Quarry			
Code	Employment	Project Cost	CER
P1	15	Rs 27,42,000/-	Rs 5,00,000/-
TOTAL	15	Rs 27,42,000/-	Rs 5,00,000/-
Existing Quarries			
Code	Employment	Project Cost	CER
E1	14	Rs 81,27,680/-	Rs. 5,00,000/-
E2	36	Rs 73,18,000/-	Rs. 5,00,000/-
E3	32	Rs. 45,80,000/-	Rs. 5,00,000/-
TOTAL	82	Rs. 2,00,25,680/-	Rs.15,00,000/-
Grand Total	97	Rs. 2,27,67,680/-	Rs. 20,00,000/-

GREENBELT DEVELOPMENT BENEFITS FROM PROPOSAL MINE

CODE	No of Trees proposed to be planted	Survival %	Area to be covered	Name of the Species
PROPOSED QUARRY				
P1	490	80	Safety barrier, Un utilized area and approach road and Panchayat Road	Neem, Pongamia, Pinnata, Causarina, etc.,
Total	490			
EXISTING QUARRIES				
E-1	845	80	Safety barrier, Un utilized area and approach road and Panchayat Road	Neem, Pongamia, Pinnata, Causarina, etc
E-2	1,715	80	Safety barrier, Un utilized area and approach road and Panchayat Road	Neem, Pongamia, Pinnata, Causarina, etc
E-3	700	80	Safety barrier, Un utilized area and approach road and Panchayat Road	Neem, Pongamia, Teak Causarina, etc
Total	3,260			

8. PROJECT BENEFITS

The proposed Rough Stone projects belongs to Thiru. C. Amavasai aims to produce 48,910m³ Rough Stone over a period of 10 years and 5,837m³ Topsoil over a period of 5 Years. This will enhance the socio-economic activities in the adjoining areas and will result in the following benefits.

This will enhance the socio-economic activities in the adjoining areas and will result in the following benefits

- Increase in Employment Potential
- Improvement in Socio-Economic Welfare
- Improvement in Physical Infrastructure
- Improvement in Social infrastructure

9. ENVIRONMENT MANAGEMENT PLAN FOR PROPOSAL QUARRY

The Environment Monitoring Cell discussed formed by the mine management will ensure effective implementation of environment management plan and to ensure compliance of environmental statutory guidelines through Mine Management Level.

The said team will be responsible for:

- ✚ Monitoring of the water/ waste water quality, air quality and solid waste generated
- ✚ Analysis of the water and air samples collected through external laboratory
- ✚ Implementation and monitoring of the pollution control and protective measures/ devices which shall include financial estimation, ordering, installation of air pollution control equipment, waste water treatment plant, etc.
- ✚ Co-ordination of the environment related activities within the project as well as with outside agencies
- ✚ Collection of health statistics of the workers and population of the surrounding villages
- ✚ Green belt development
- ✚ Monitoring the progress of implementation of the environmental monitoring programme
- ✚ Compliance to statutory provisions, norms of State Pollution Control Board, Ministry of Environment and Forests and the conditions of the environmental clearance as well as the consents to establish and consents to operate.

10. CONCLUSION

It can be concluded from overall assessment of the impacts, in terms of positive and negative effects on various environmental components, that the mining activities will not have any adverse effect on the surrounding environment.

To mitigate any impacts due to the mining activities, a well-planned EMP and a detailed post project monitoring system is provided for regular monitoring and immediate rectification at site. Due to the cluster quarrying activities, socio economic conditions in and around the project site will be improved substantially. Hence, the Prior Environmental Clearance shall be granted at the earliest.