EXECUTIVE SUMMARY

FOR OBTAINING

Environmental Clearance under EIA Notification – 2006
Schedule Sl. No. 1 (a) (i): Mining Project

"B1" CATEGORY (Cluster) – MINOR MINERAL – CLUSTER –

PATTA LAND - FRESH QUARRY

THIRU. S. SUBRAMANIAN LIMEKANKAR QUARRY

CLUSTER EXTENT – 13.33.5 Ha

(1 Proposed Quarry + 2 Existing Quarries)

PROJECT PROPONENT

Proponent Name	Project Location
Thiru.S.Subramanian No. 69, Ganapathy Nagar, Thiruvanaikovil, Trichy District – 620 005.	**Extent: 3.54.5 ha** S.F.Nos. 189/2A, 2B, 190/1A, 1B, 2, 4, 5 Keelapalur Village & 31/1 Karuppur Senapathy Village, Ariyalur Taluk, Ariyalur District

Complied as per ToR obtained

File No. 10926 TOR Identification No. TO24B0108TN5928344N Dated:12.07.2024

Environmental Consultant

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/RA0276
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Laboratory

EHS 360 LABS PRIVATE LIMITED,
NABL Accredited laboratory
10/2 Ground floor, 50th street, 7th Avenue,
Ashok Nagar, Chennai – 600 083.

Baseline Monitoring Period: Dec 2024 to Feb 2025

MAY 2025

* Calculated as per MoEF & CC Notification – S.O. 2269(E) Dated: 01.07.2016

1. INTRODUCTION

The project proponent Thiru.S. Subramanian applied for Limekankar Deposit quarry over an extent of 3.54.5Ha in S.F.Nos.189/2A, 2B, 190/1A, 1B, 2, 4, 5, Keelapalur Village &31/1 Karuppur Senapathy, Ariyalur Taluk, Ariyalur District

- Proponent applied for Limekankar deposit quarry lease on 14.07.2016
- Precise area communication letter was issued by the Principal Secretary vide Letter No.9561/MMC.2/2018-3, Dated: 04.03.2019.
- The Mining plan has been prepared by the Qualified person and got approval vide Letter No.2522/MM10/2018 Dated: 08.03.2019
- The Mining plan has been approved for the quantity of **69,449** Ts of ROM & 69,449 Ts of Limekankar up to the depth of 2m bgl for the period of Five years.

Proponent applied for Terms of Reference vide Proposal No. SIA/TN/MIN/474122/2024 dated 19.06.2024 and the ToR Was Granted vide **File. No.11252 TOR Identification No.TO24B0108TN5875455N Dated:22.10.2024**

- As per the EIA Notification, 2006 and subsequent amendments and OM The proposal falls in the B1 Category (Cluster quarries – 1 proposal, 2 Existing quarries forming Cluster Category {Total Extent of the Cluster is 13.33.5 Ha}- Cluster area calculated as per MoEF & CC Notification S.O. 2269(E) Dated 1st July 2016).

Based on the ToR Baseline Monitoring study has been carried out for one season Winter Season i.e. Dec 2024 to Feb 2025. and this EIA and EMP report is prepared for considering cumulative impacts arising out of these projects, the Cumulative Environmental Impact Assessment study is undertaken, which is followed by preparation of a detailed Environmental Management Plan (EMP) to minimize those adverse impacts.

1.1 DETAILS OF PROJECT PROPONENT –

Name of the Project Proponent	Thiru.S. Subramanian
Address	No. 69, Ganapathy Nagar, Thiruvanaikovil, Trichy District – 620 005.
Mobile	+91 94892 01001
Email	dcpmaruthi@gmail.com
Status	Individual

Source: Approved Mining Plan

1.2 QUARRY DETAILS WITHIN 500 M RADIUS

PROPOSED QUARRIES					
Code	**Name of the Owner**	**Village**	**S.F. Nos**	**Extent in Ha**	**Status**
P1	Thiru.S.Subramanian	Keelapalur & Karuppur Senapathy	189/2A, 2B, 190/1A, 1B, 2, 4, 5 &31/1	3.54.5	File No.10926 TOR Identification No. TO24B0108TN5928344N Dated:12.07.2024
	TOTAL EXTENT			**3.54.5**	
EXISTING QUARRIES					
Mineral: Limestone					
Code	**Name of the Owner**	**Village**	**S.F. Nos**	**Extent in Ha**	**Status**

E-1	Tvl.Chettinad Cement Corparation Private Limited	Karuppur Senapathy	31/2A,2B etc	4.00.0	29.04.2013 to 28.04.2033
E-2	S.Saravanan	Karuppur Senapathy	6/4 etc	4.67.0	03.03.2006 to 02.03.2026
E-3	Tvl.Vijay Cements	Karuppur Senapathy	30/2D, 30/3B etc	3.88.0	20.05.2003 to 19.05.2023
			TOTAL EXTENT	**12.55.0**	
Mineral: Limekankar					
E-4	S.Saravanan	Karuppur Senapathy	6/1,2,3A etc.	4.86.5	14.11.2022 to 13.1.2032
E-5	S.Saravanan	Karuppur Senapathy	32/1,3,33/2A etc	4.92.5	10.12.2021 to 09.12.2031
			TOTAL EXTENT	9.79.0	
ABANDONED / EXPIRED QUARRIES					
Nil					
			TOTAL CLUSTER EXTENT	**13.33.5Ha**	

Note: -Cluster area is calculated as per MoEF & CC Notification – S.O. 2269 (E) Dated: 01.07.2016

1.2 SALIENT FEATURES OF THE PROPOSAL

DESCRIPTION OF THE PROJECT

Name of the Project	Thiru. S. Subramanian Limekankar Quarry	
S.F. No.	**189/2A, 2B, 190/1A, 1B, 2, 4, 5 & 31/1**	
Extent	3.54.5 ha	
Village Taluk and District	Keelapalur & Karuppur Senapathy Village, Ariyalur Taluk, Ariyalur District.	
Land Type	patta land	
Land Ownership	It is Patta Land, registered in the name of Thiru. S. Saravanan, vide pata Nos. 874 & Thiru. S. Subramanian, vide patta Nos. 592 & 1115. The applicant has registered lease deed with Pattadar for 12 Years Doc. No 2813/2019	
Toposheet No	58 - M/04	
Latitude between	**11° 03' 08.69''N to 11° 03' 21.46''N**	
Longitude between	**79° 04' 41.05''E to 79° 04' 49.00''E**	
Elevation of the area	72m(Max) AMSL	
Lease period	10 Years	
Mining Plan period	5 years	
Proposed Depth of Mining	2m Bgl	
	Limekankar T_s	Top Soil T_s
Geological Resources	1,59,525 T_s	21,270 T_s
Mineable Reserves	1,13,360 T_s	16,166 T_s
Year wise Production Five Years	69,449	10,010
Peak Production	37,908	5,445
Ultimate Pit Dimension	Pit I-166m(L) x 55m(W) x 2.3m(D) Bgl Pit II-170m(L) x 72m(W) x 2.3m(D) Bgl	
Water Level in the region	20-25 m bgl	
Method of Mining	Opencast Mechanized Mining Method without Drilling and Blasting	

Topography	The lease applied area is situated in flat terrain. The area has gentle sloping towards South-eastern side. The altitude of the area is 72m (max) above Mean Sea level. The area is covered by Topsoil having an average thickness of 0.3m and followed by Massive Lime kankar Which is clearly inferred from the adjacent existing quarry pit	
Machinery proposed	Excavator with Bucket and Rock Breaker	1 Nos
	Tipper	1 Nos
Proposed Manpower Deployment	15 Nos	
Fixed Asset Cost	Rs.34,37,778/-	
Operational Cost	Rs.17,00,000/-	
EMP Cost	Rs. 2,25,000/-	
Total Project cost	Rs. 53,62,778/-	
CER Cost	Rs. 5,00,000/-	
Nearby Water Bodies	Ematteri	110m East
	Kuttai	240m North
	Odai	370m East
	Periya Eri	1km SW
	Marudaiyar River	2.8km NE
	Tank	8km SW
Greenbelt Development Plan	Proposed to plant 1800 Nos of trees considering 500 Nos of trees/ Ha criteria. The plantation will be developed around the project site and nearby village roads	
Proposed Water Requirement	2.0 KLD	
Nearest Habitation	500m – South West	
Nearest Reserve Forest	Vilangudi R.F – 13.30 km – NE	
Nearest Wild Life Sanctuary	Karaivetti Birds Sanctuary – 7.2Km - SW	

Source: Approved Mining Plan

1.3 STATUTORY DETAILS

SCREENING:

- Proponent applied for Limekankar Deposit Quarry lease on 14.07.2016
- Precise area communication letter was issued by the Principal Secretary vide Letter No.9561/MMC2/2018-3, Dated: 04.03.2019
- The Mining plan has been prepared by the Qualified person and got approval vide Letter No./2522/MM10/2018 Dated: 08.03.2019.
- The proposed project falls under "B1" Category as per Order Dated: 04.09.2018 & 13.09.2018 passed by Hon'ble National Green tribunal, New Delhi in O.A. No. 173 of 2018 & O.A. No, 186 of 2016 and MoEF & CC Office Memorandum F. No. L-11011/175/2018-IA-II (M) Dated: 12.12.2018
- Proponent applied for ToR for Environmental Clearance vide online Proposal No. SIA/TN/MIN/474122/2024 dated 19.06.2024

SCOPING:

- The proposal was placed in 477th SEAC meeting held on 20.06.2024 and the committee recommended for issue of ToR.
- The proposal was considered in 737th Authority meeting held on 09.07.2024&10.07.2024, issued ToR vide **File No.10926. TOR Identification No TO24B0108TN5928344N, dated: 12.07.2024**

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.

The method of mining is by open cast method; excavator will be deployed for the formation of benches and loading. No drilling and blasting is carried out.

2.1 SITE CONNECTIVITY TO THE PROJECT AREA

Nearest Roadway	(NH-81) -Trichy -Chidhambaram 0.4 km – South SH (139) – Ariyalur -Kumbakonam-7.5km-NE
Nearest Village	Keelapalur 1km-SW
Nearest Town	Ariyalur – 10.5 km-N
Nearest Railway Station	Ariyalur – 10.5 km – North
Nearest Airport	Trichy– 52.0 km –South West
Seaport	Tuticorin 275 km – South West

Source: Survey of India Toposheet

2.2 LAND USE PATTERN OF THE LEASE APPLIED AREA

Description	Present Area (Ha)	Area to be reclaimed at the end of present Mining Plan Period (Ha)	Area at the end of life of quarry (Ha)
Area under quarrying	Nil	1.64.4	2.54.2
Dumps	Nil	0.10.4	Nil
Infrastructure	Nil	0.01.0	0.01.0
Roads	Nil	0.03.0	0.03.0
Green Belt	Nil	0.20.0	0.37.0
Un utilized area	3.54.5	1.55.7	0.59.3
Total	**3.54.5**	**-**	**3.54.5**

Source: Approved Mining Plans of Proposal

2.3 OPERATIONAL DETAILS OF LEASE APPLIED AREA

PARTICULARS	DETAILS		
	ROM	Limekankar	Topsoil
Geological Resources	1,59,525	1,59,525	21,270
Mineable Reserves	1,13,360	1,13,360	16,166
Production for five-year plan period	69,449	69,449	10,010
Peak Production	37,908	37,908	5,445
Mining Plan Period / Lease Applied Period	5 Years		
Number of Working Days	300 Days		
Production per day	126	126	18
No of Lorry loads ($12m^3$ per load)	11	11	1-2
Total Depth of Mining	2.3m below ground level		

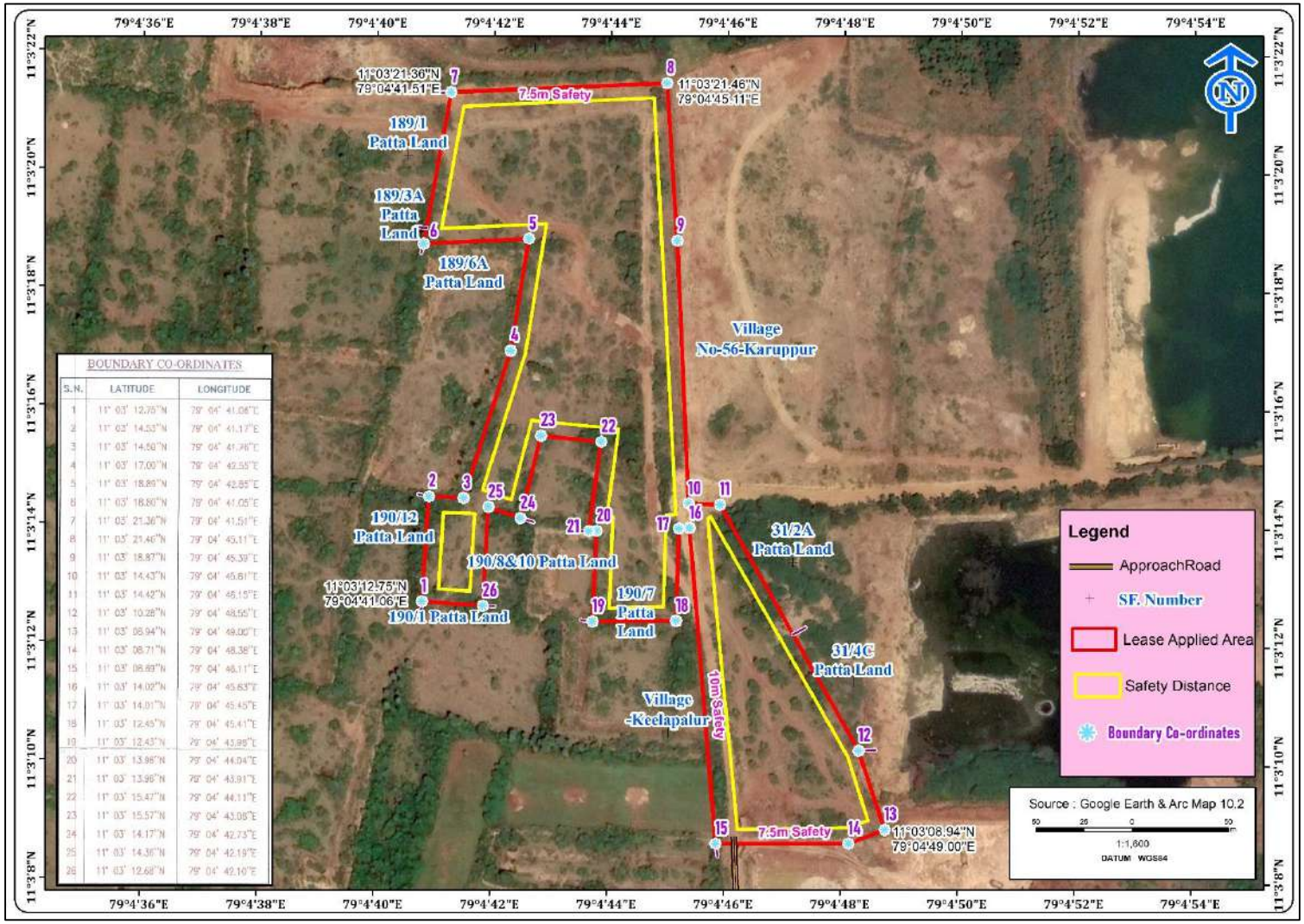
Source: proposed mining plan

2.4 OPERATIONAL DETAILS OF LEASE APPLIED AREA

Years	ROM (Ts)	Limekankar Recovery@ 100%(Ts)	Top soil (Ts)
1st year	37,908	37,908	5,445
2nd year	8,829	8,829	1,363
3rd year	9,050	9,050	1,301
4th year	6,831	6,831	950
5th year	6,831	6,831	950
Total	**69,449**	**69,449**	**10,010**

Source: proposed mining plan

FIGURE – 1: GOOGLE IMAGE OF THE PROJECT AREA



Source: Google Earth Imagery

FIGURE – 2: SATELLITE IMAGERY MAP 500M RADIUS

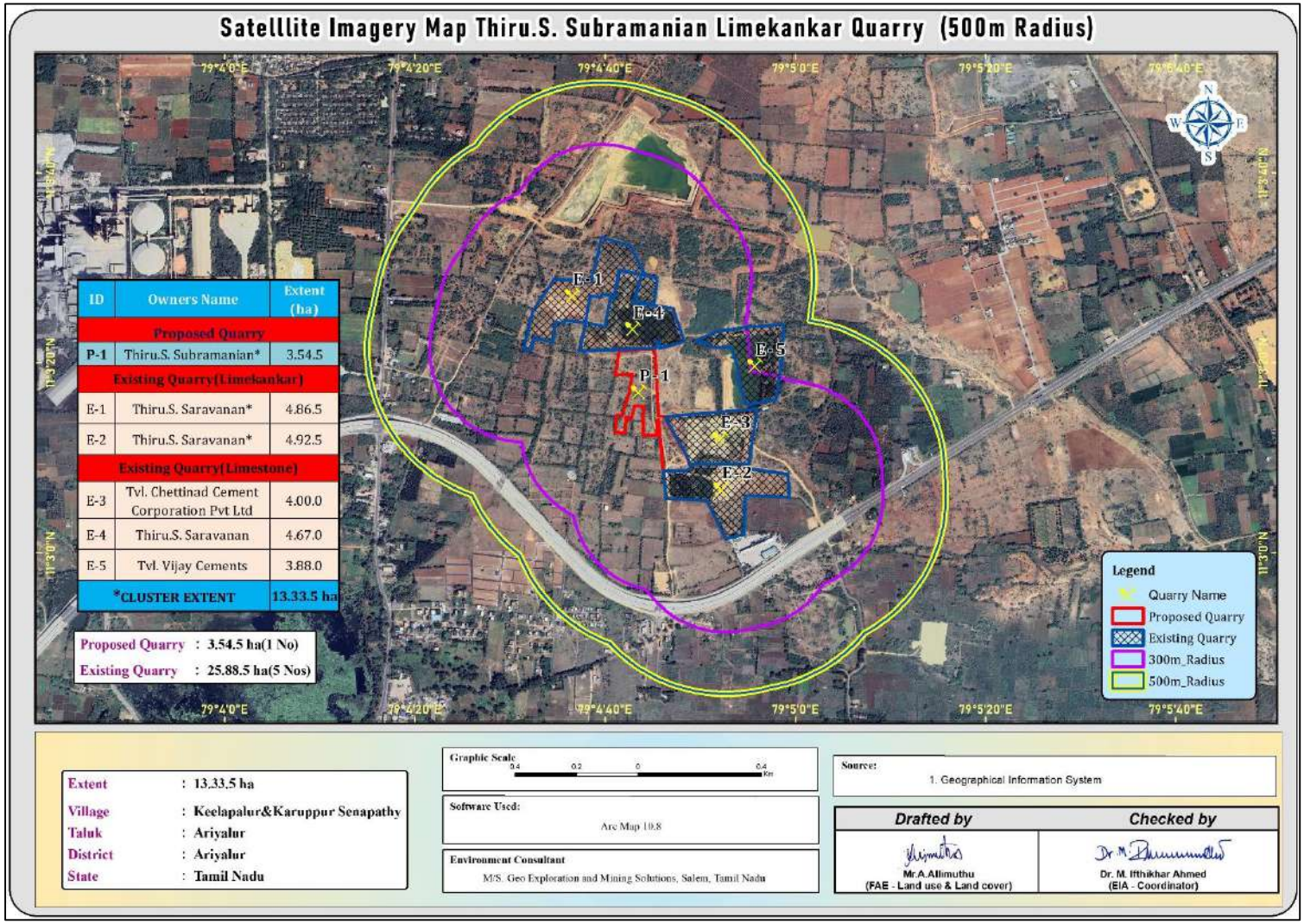


FIGURE 3: QUARRY LEASE PLAN / SURFACE PLAN

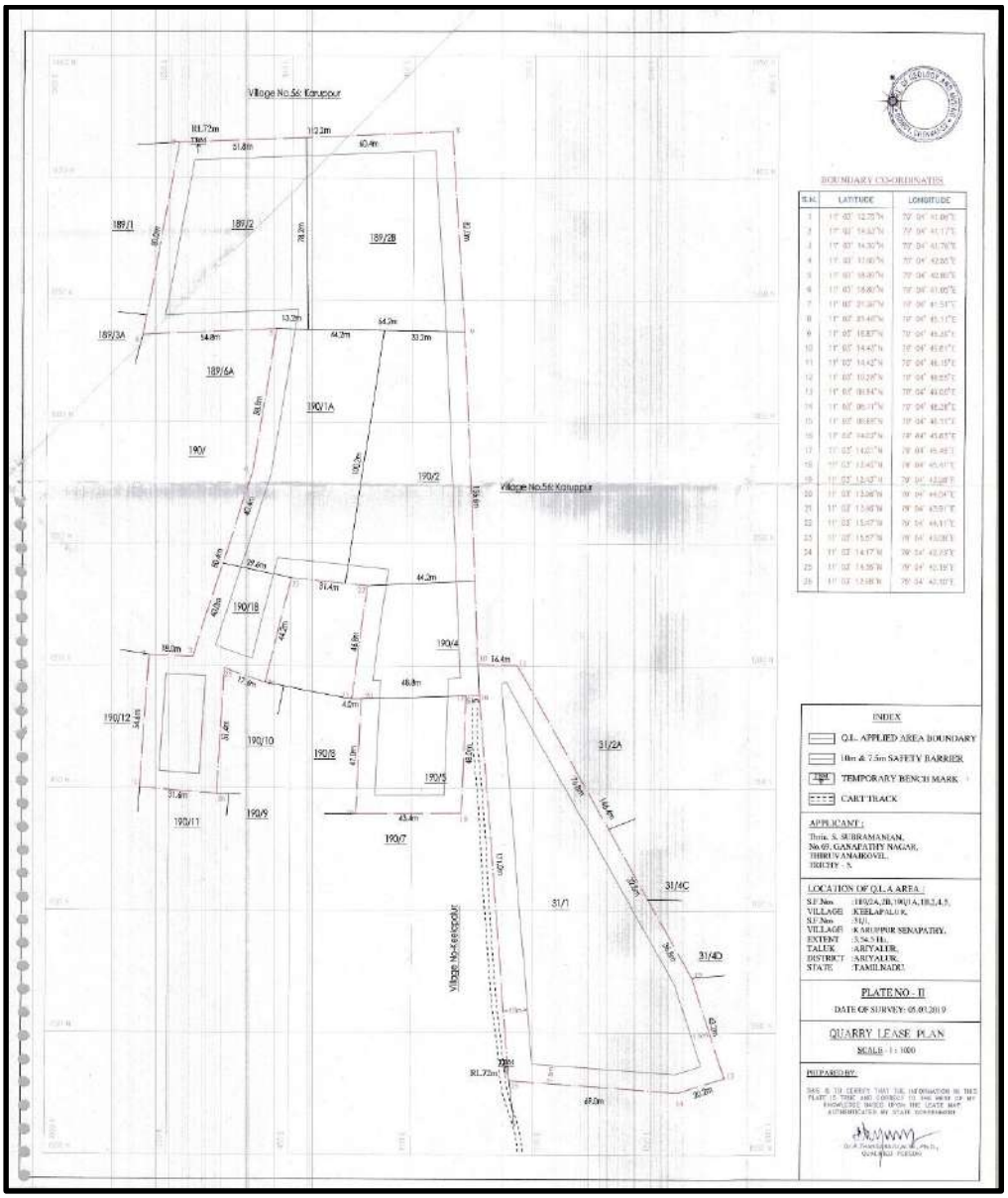
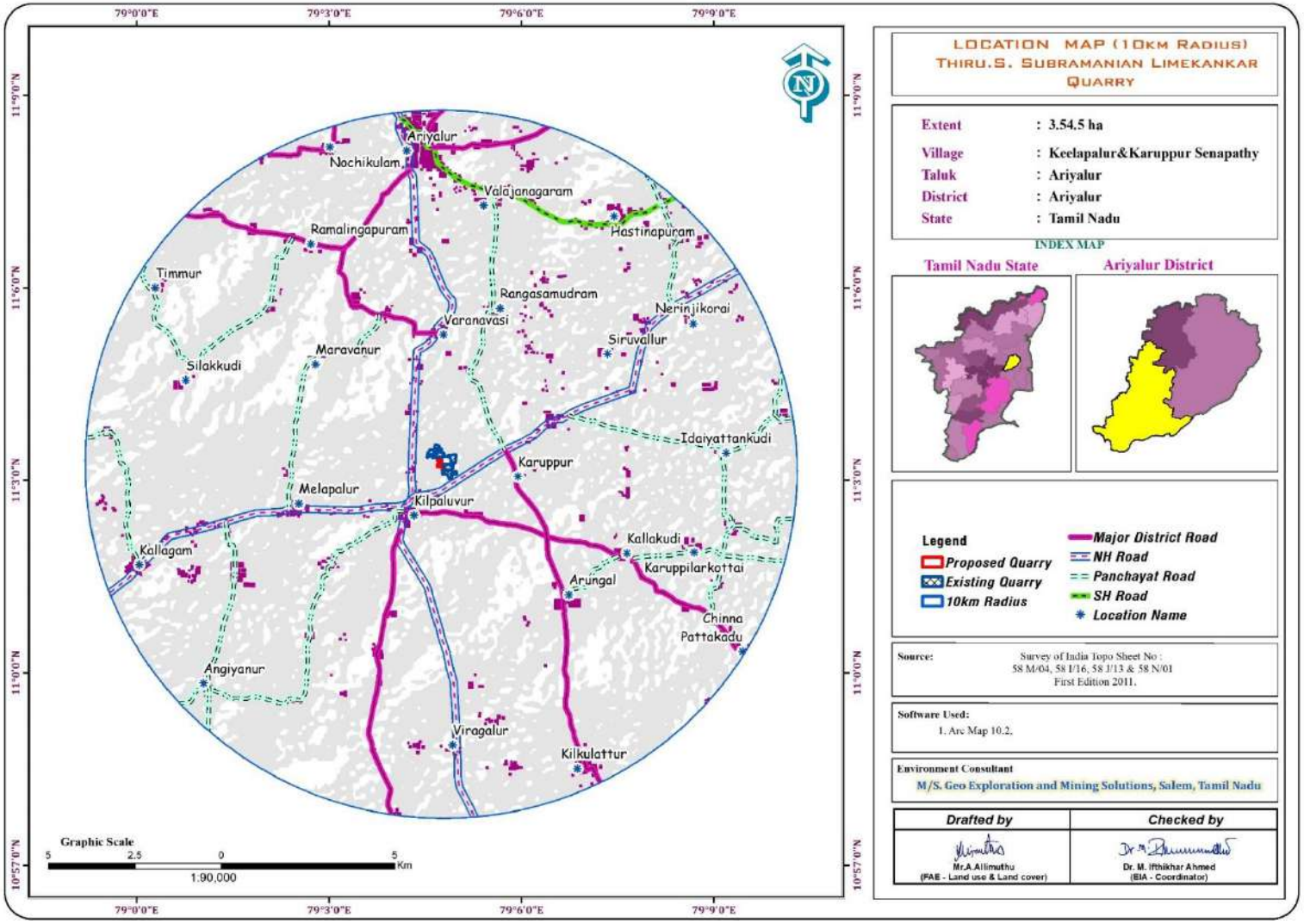


FIGURE – 4: IMAGE SHOWING SURFACE FEATURES AROUND 10 KM RADIUS



2.5 METHOD OF MINING

The method of mining is by open cast method; excavator will be deployed for the formation of benches and loading. It is a conventional mechanized quarrying operation without drilling and blasting. The operation will be confined to general shift i.e., from 8.00 AM to 5.00 PM (1-hour lunch interval).

In topsoil is one bench is maintained with 0.3m height and 1.0m width and face kept at 45° slope. In mineral one bench is maintained with 2.0m height and width with 60° slope (Refer Plate No. V).

The advancement of the pit will be from the Southeast and center portion of the lease applied area starting from South and progress towards Northern side of the lease area upto 2.3m [0.3m Topsoil + 2m Limekankar] from RL 72.0m to RL 69.7m during the present plan period. During the present plan period, the mining operations are proposed to be carried out in the first and second benches.

2.6 PROPOSED MACHINERY DEPLOYMENT

S.NO.	TYPE	NOS	SIZE/CAPACITY	MOTIVE POWER
1	Excavator	1	0.9m^3	Diesel Drive
2	Tipper	1	20 Tonnes	Diesel Drive

Source: Approved Mining Plan

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 principal 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.

3. DESCRIPTION OF THE ENVIRONMENT

Field monitoring studies to evaluate the base line status of the project site were carried out during Dec 2024 to Feb 2025 as per CPCB guidelines. Environmental Monitoring data has been collected with reference to proposed mine by EHS 360 Lab Private Limited.

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 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	1 Hourly Continuous Mechanical/Automatic Weather Station	1	Site specific primary data& Secondary Data from IMD Station

	Rainfall			
*Ambient Air Quality	PM10 PM2.5 SO2 NOX Fugitive Dust	24 hourlies twice a week (Dec 2024 to Feb 2025)	7 (1 core & 6 buffer)	IS 5182 Part 1-23 National Ambient Air Quality Standards, CPCB
*Noise Levels	Ambient Noise	Hourly observation for 24 Hours per location	7 (1 core & 6 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 – Forest Working Plan
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.

Source: On-site monitoring/sampling by EHS 360 Lab Private Limited in association with GEMS

* All monitoring and testing have been carried out as per the Guidelines of CPCB and MoEF & CC.

3.2 LAND ENVIRONMENT

S.No	CLASSIFICATION	AREA_HA	AREA_%
BUILTUP			
1	Builtup Urban	550.59	1.69
2	Builtup Rural	799.61	2.46
3	Builtup Mining	517.16	1.59
AGRICULTURAL LAND			
4	Crop Land	25097.03	77.23
5	Plantation	209.28	0.64
6	Fallow Land	811.38	2.50
BARREN/WASTE LANDS			
7	Scrub Land	1378.59	4.24
8	Ravinous Land	709.72	2.18
9	Salt Affected Land	707.55	2.18
WETLANDS/ WATER BODIES			
9	Waterbodies	1716.96	5.28
TOTAL		**32497.86**	**100.00**

Interpretation

From the above table, pie diagram and land use map it is inferred that the majority of the land in the study area is Agriculture and fallow land (includes crop land) 80.37 % followed by Built-up Lands – 4.15 %, Scrub land – 4.24 %, Ravinous land -2.18%, and Water bodies 5.28%.

The total mining area within the study area is 517.16 ha i.e., 1.59%. The cluster area of 13.33.5ha contributes about 2.57% of the total mining area within the study area. This small percentage of Mining Activities shall not have any significant impact on the environment.

3.3 SOIL ENVIRONMENT

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 (27.7 % to 33.8%) to Sandy Loam Soil and Bulk Density of Soils in the study area varied between 1.01 to 1.11 g/cc. The Water Holding Capacity is found to be medium i.e., ranging from 45.9 – 49.5 %.

Chemical Characteristics –

- The nature of soil is slightly alkaline to strongly alkaline with pH range 8.1 to 8.98
- The available Nitrogen content range between 400 to 523.7 mg/kg
- The available Phosphorus content range between 3.7 to 5.13 mg/kg
- The available Potassium range between 32.1 to 60.2 mg/kg

3.4 WATER ENVIRONMENT

Surface Water

The pH varied from 7.14 to 7.97 while turbidity found within the standards (Optimal pH range for sustainable aquatic life is 6.5 to 8.5 pH).

Total Dissolved Solids:

Total Dissolved Solids varied from 1027 to 1210 mg/l, the TDS mainly composed of carbonates, bicarbonates, Chlorides, phosphates and nitrates of calcium, magnesium, sodium and other organic matter.

Other parameters:

Chloride content is 417-551 mg/l. Nitrates varied from BDL 7.08- 7.22 mg/l, while sulphates varied from 40.2-54.3 mg/l.

Ground Water

The pH of the water samples collected ranged from 6.8 to 7.89 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 115.17 – 185.64 mg/l in all samples. Total hardness varied between 380– 520mg/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 – 5: WIND ROSE DIAGRAM

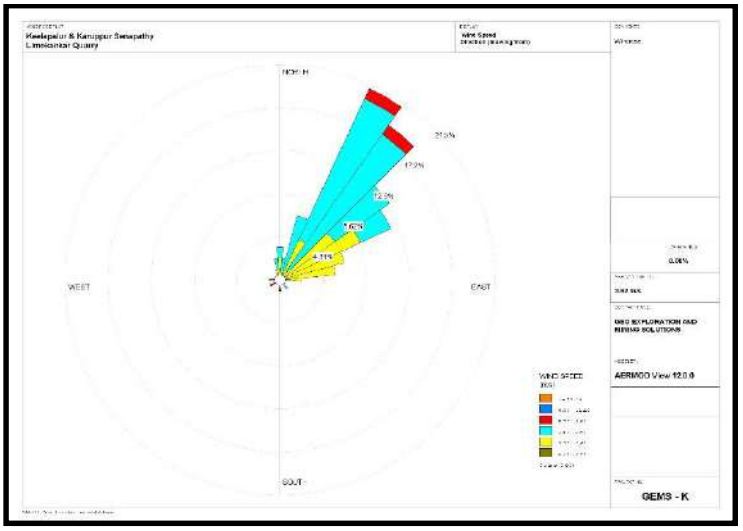
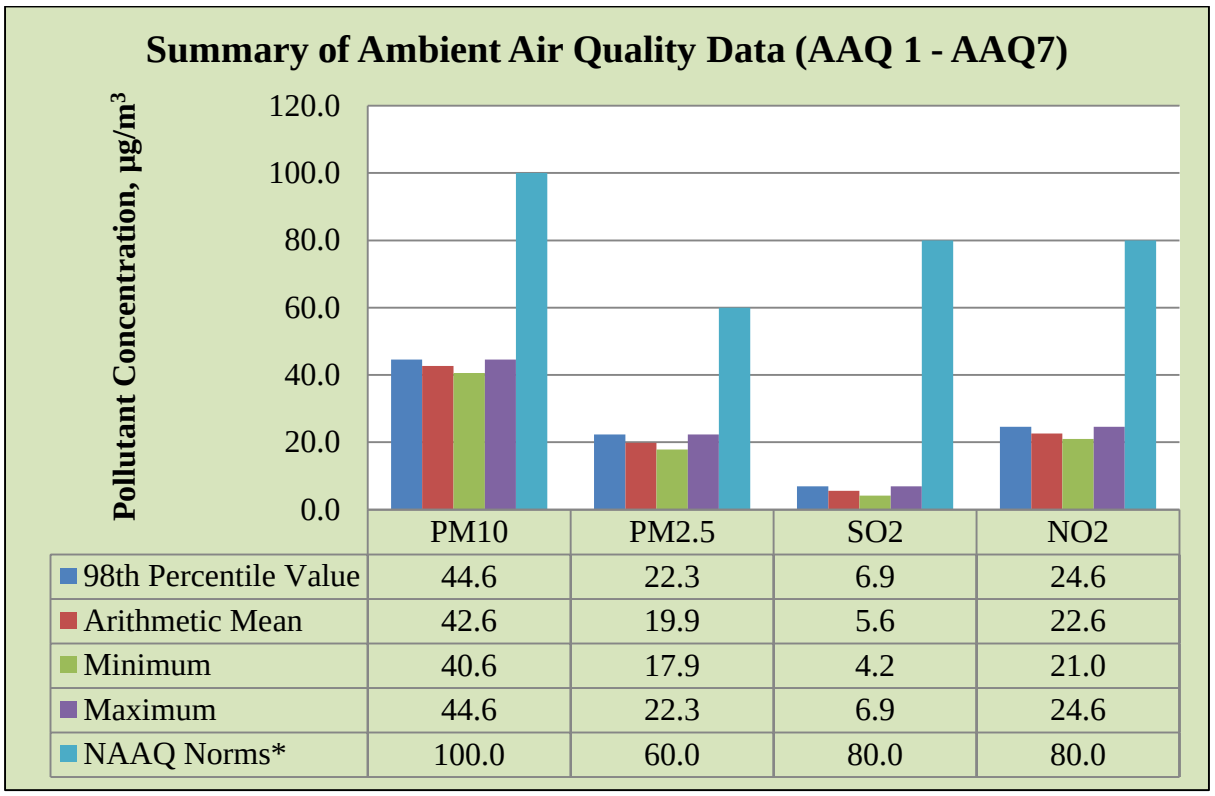


FIGURE – 6. BAR DIAGRAM OF SUMMARY OF AAQ1 – AAQ7



	PM10	PM2.5	SO2	NO2
98th Percentile Value	44.6	22.3	6.9	24.6
Arithmetic Mean	42.6	19.9	5.6	22.6
Minimum	40.6	17.9	4.2	21.0
Maximum	44.6	22.3	6.9	24.6
NAAQ Norms*	100.0	60.0	80.0	80.0

The results of ambient air quality monitoring for the period (Dec 2024 to Feb 2025) are presented in the report. Data has been complied for three months.

Interpretations & Conclusion

As per monitoring data, PM10 ranges from 41.3 µg/m3 to 42.9 µg/m3, PM2.5 data ranges from 18.4 µg/m3 to 20.5 µg/m3, SO2 ranges from 4.8µg/m3 to 5.7µg/m3 and NO2 data ranges from 21.4 µg/m3 to 23.2 µg/m3. The concentration levels of the above criteria pollutants were observed to be well within the limits of NAAQS prescribed by CPCB.

3.6 NOISE ENVIRONMENT

Ambient noise levels were measured at 7 (Seven) locations around the proposed project area. Noise levels recorded in core zone during day time were from 43.1 dB (A) Leq and during night time were from

38.2 dB (A) Leq. Noise levels recorded in buffer zone during day time were from 37.8 to 40.9dB (A) Leq and during night time were from 35.4 to 36.6 dB (A) Leq. 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 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

- 2.54.2 Ha of the land will be under mining sine the Permanent or temporary change on land use and land cover will occur
- 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 2.54.2 Ha of the land will be converted into temporary reservoir which will full fill the water scarcity in the drought season and the nearby agriculture land will have benefitted by the supply of water
- About 1800 Nos of trees will be planted in the lease area and approach road will retain the ecosystem
- The mining activity will be gradual confined in blocks and excavation will be undertaken progressively along with other mitigative measures like phase wise development in the production
- Construction of garland drains all around the quarry pits and construction of silt trap at strategic location in lower elevations to prevent 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.,
- Fencing will be constructed before starting the mining operation and it will be maintained in 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.
- 2.0 KLD water will be utilized for the quarrying operation.

MITIGATION MEASURES

- Water for the quarrying operation such as sprinkling on haul roads, Greenbelt development will be sourced from the lower part of the mine pit which is specifically allotted to collect the rain water.
- Garland drain, settling tank will be constructed along the proposed mining lease area. The Garland drain will be connected to settling tank and sediments will be trapped in the settling traps and only clear 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 and such sites where dust likely to be generated and for developing green belt. The proponent will collect and judicially utilize the rainwater as part of rainwater harvesting system.
- Periodic (every 6 months once) 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.

4.3 AIR ENVIRONMENT

ANTICIPATED IMPACT

- During mining, at various stages activities such as excavation and transportation of materials, particular matter (PM), gases such as Sulphur dioxide, oxides of Nitrogen from vehicular exhaust are the main air pollutants.
- 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

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 taurpaulin
- 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 Loading and during movement of vehicles.

MITIGATION MEASURES

- 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 though 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 found within 10km radius.

Karaivetti Birds Sanctuary is located 7.2km – SW from the quarry site.

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 tress proposed to be planted	Area to be covered in m^2	Name of the species
I	1800	The safety zone along the boundary barrier and Village roads has been utilized for Greenbelt development.	Vilvam, Kondrai, Vembu, Puliyam, Badam, Naval, Vagai etc.,

4.6 SOCIO ECONOMIC ENVIRONMENT

ANTICIPATED IMPACT

Employment generation due to the project will provide direct employment for about 15 persons.

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.

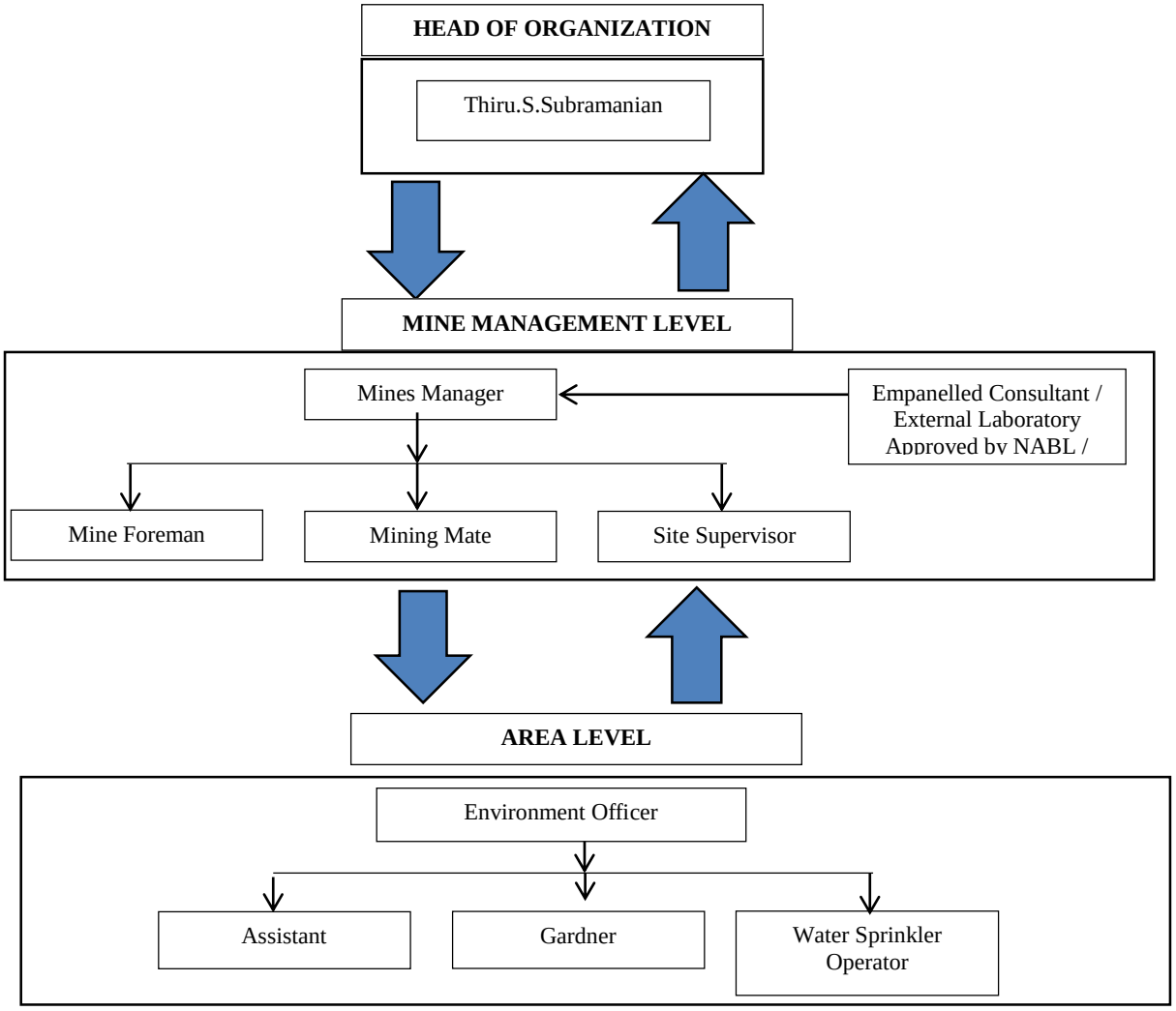
6. ENVIRONMENT MONITORING PROGRAM

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 PROPOSED ENVIRONMENTAL MONITORING CELL



6.2 POST ENVIRONMENTAL CLEARANCE MONITORING SCHEDULE

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)	–	-	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

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

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 LIMEKANKAR

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
P1	69449	13890	46	4
Total	**69449**	**13890**	**46**	**4**
E1	102920	20584	69	6
E2	110012	22002	73	6
Total	**212932**	**42586**	**142**	**12**
Grand Total	**282381**	**56476**	**188**	**16**

CUMULATIVE PRODUCTION LOAD OF TOPSOIL

Quarry	Production for one / three-year plan period	Per Year Production in m^3	Per Day Production in m^3	Number of Lorry Load Per Day
P1	10010	2002	7	1
Total	**10010**	**2002**	**7**	**1**
E1	14,382	2876	10	1
E2	15134	3027	10	1
Total	**29516**	**5903**	**20**	**2**
Grand Total	**39526**	**7905**	**27**	**3**

SOCIO ECONOMIC BENEFITS FROM 5 MINES

Location ID	Project Cost	CER
P1	Rs. 53,62,778/-	Rs.5,00,000
E1	Rs. 58,51,040/-	Rs.5,00,000
E2	Rs. 65,12,162/-	Rs.1,30,000
Total	**Rs.17,725,980/-**	**Rs.11,30,000/-**

EMPLOYMENT BENEFITS FROM 5 MINES

Description	Employment
P1	15
E1	15
E2	15
Total	**45**

A total of 15 people will get employment due to 1 proposed mines in cluster and 30 people are already employed at 1 existing mines

GREENBELT DEVELOPMENT BENEFITS FROM MINES

CODE	No of Trees proposed to be planted	Area Covered Sq.m	Name of the Species
P1	1800	The safety zone along the boundary barrier has been identified to be utilized for Greenbelt development	Vilvam, Kondrai, Vembu, Puliyam, Badam, Naval, Vagai etc.,
Total	**1800**		
E1	2450		
E2	2470		
Total	**4920**		
G. Total	**6720**		

8. PROJECT BENEFITS

The Proposed Project for Quarrying Limekankar at Keelapalur & Karuppur Senapathy Village aims to produce about 69449 Ts Limekankar over a period of 5 Years & Topsoil of 10010 Ts. 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

The Environment Monitoring Cell 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.

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