

EXECUTIVE SUMMARY OF EIA DRAFT

FOR

V.KAVITHA ROUGH STONE QUARRY PROJECT

Environmental Clearance under EIA Notification – 2006

“B1” CATEGORY – MINOR MINERAL – CLUSTER – NONFOREST LAND

Cluster Extent:16.03.0 ha

At

Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu.

ToR issued vide Lr. No. SEIAA- TN/F.No.9511/ToR-1311/2022 dated

07.12.2022

NAME AND ADDRESS OF THE PROPOSED PROJECT PROPONENT

Name and Address	Extent & S.F. No.
V.Kavitha, W/o P. Vadivel, Door No. 8/42, Nochikattur, Kuppam Village, Pugalur Taluk, Karur District.	1.88.0 ha and 75/1A,75/1B& 75/2.

Environmental Consultant

GEO TECHNICAL MINING SOLUTIONS



No: 1/213-B, Ground Floor, Natesan Complex
Oddapatti, Collectorate Post office,
Dharmapuri-636705. TamilNadu.
Mob. : +91 9443937841, +917010076633,
E-mail: info.gtmsdpi@gmail.com,
Website: www.gtmsind.com



NABET ACC. NO: **NABET/EIA/2023/IA0067**

Valid till : **29th Dec.2023**

Environment Lab

EKDANT ENVIRO SERVICES (P) LIMITED

NABL Accredited & Recognised Laboratory
No.R7/1, AVK Tower, North Main Road, Anna
Nagar, West Exten.Chennai-600 101

Baseline Monitoring Period October 2021 to December 2021

CHAPTER I INTRODUCTION

As the proposed rough stone and gravel mining project, known as P1 falls within the 500 m radius cluster of quarries with the total extent of >5 ha (**i.e.,16.03.0 ha**), it is classified under category “B1” and requires submission of EIA report for grant of Environmental Clearance (EC) after conducting public hearing. The cluster contains six proposed projects, one existing project, and one expired project. All the projects mentioned above have been taken for cluster extent calculation as per MoEF & CC Notification S.O. 2269 (E) Dated 1st July 2016, as shown in Figure 1.1. This EIA draft discusses the cumulative impacts of six proposed projects and the one existing project in a cluster on the environment and provides a detailed Environmental Management Plan (EMP) to minimize the adverse impacts of those projects situated in the cluster falling in Kuppam Village, Pugalur Taluk, Karur District and Tamil Nadu State. It has been prepared in compliance with ToR issued vide Lr.No. SEIAA-TN/F.No.9511/ToR-1311/2022 dated 07.12.2022 for the proposed project by conducting baseline study during the period of October to December 2021. Details of the project proponent and the list of quarries within the cluster of 500 m radius have been provided in Tables 1.1 and 1.2 respectively.

Table 1.1 Details of Project Proponent

Name	V. Kavitha
Address	W/o P. Vadivel Door No. 8/42, Nochikattur, Kuppam Village, Pugalur Taluk, Karur District.
Status	Proprietor

Table 1.2 Details of Quarries within the cluster area of 500 m radius

Proposed Quarries				
Code	Name of the Owner	S.F.Nos. Village	Extent(ha)	Lease Period/ Remarks
P1	V. Kavitha	75/1A,75/1B& 75/2 Kuppam	1.88.0	Proposed Area
P2	Tvl. NTC Blue Metals LLP	76/1(p) Kuppam	0.63.0	

P3	Thiru. S. Sadhasivam	211/1, 211/2 Kuppam	1.54.0	Proposed Area
P4	K. Nallasamy	226/1(p) Kuppam	2.89.0	
P5	K. Shanmugam	76/2 Kuppam	0.73.5	
P6	Tvl. NTC Blue Metals LLP	362/2(p) Kuppam	2.19.0	
Existing Quarries				
E1	Tvl. venkatachalapathi	213/1,214/2A, 214/2B,214/2C, 220/3P,221/P Kuppam	4.05.0	23.06.2017 To 22.06.2022
Expired Quarries				
EX1	Thiru. P. Marappan	74 75/3B Kuppam	2.11.5	14.10.2016 To 13.10.2021
Total Cluster Extent			16.03.0	

Source:

- i. DD Letter-Rc.No.311/Mines/2021, Dated:16.09.2021
- ii. DD Letter-Rc.No.619/Mines/2020, Dated:22.06.2021
- iii. DD Letter-Rc.No.387/Mines/2021, Dated:28.09.2022
- iv. DD Letter-Rc.No.407/Mines/2021, Dated:20.07.2022
- v. DD Letter-Rc.No.100/Mines/2021, Dated:22.06.2021

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

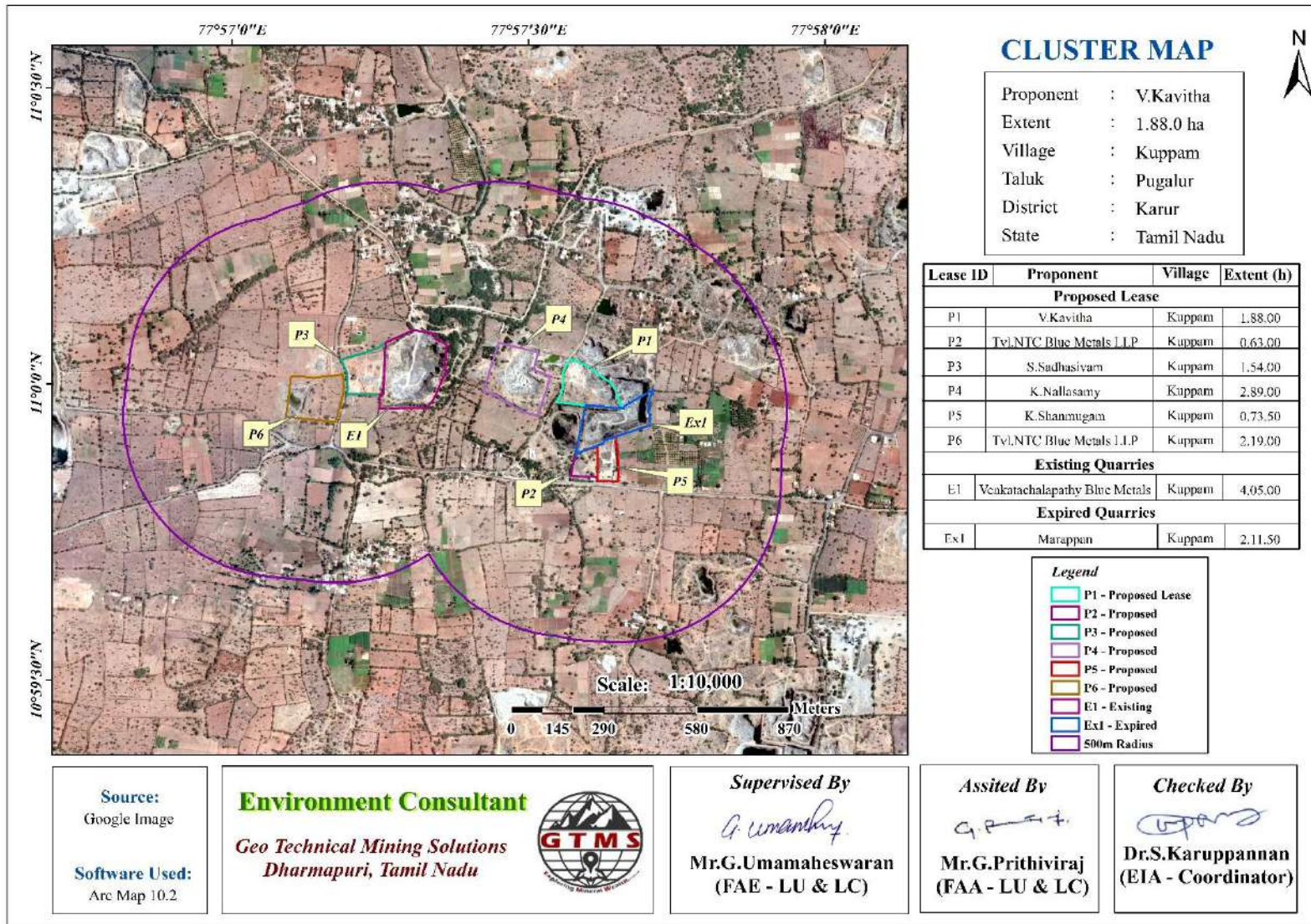


Figure 1.1 Google earth image showing 500m radius buffer and the proposed projects and existing and expired quarries

CHAPTER II

PROJECT DESCRIPTION

The proposed project deals with excavation of rough stone which is primarily used in construction projects. The method adopted for rough stone excavation is an open cast semi-mechanized mining method involving drilling, blasting and formation of benches with 5 m height and 5 m width and secondary blasting. The proposed project area is located between latitudes from 10°59'57.47"N to 11°00'02'56"N and from longitudes from 77°57'32.82"E to 77°57'39.69"E in Kuppam Village, Pugalur Taluk, and Karur District. The project site is a Patta land with the extent of 1.88.0 ha owned by the project proponent. The proponent had applied for quarry lease on 08.09.2021 to extract rough stone and obtained the precise area communication letter issued by Department of Geology and Mining, Karur vide Rc.No.387/mineral/2021, dated 12.08.2022. Based on the precise area communication letter, mining plan was prepared. The mining plan thus prepared was approved by Deputy Director of Geology and Mining, Karur (R.c. No.387/Mines/2021 dated 22.09.2022).

According to the approved mining plan, about 22500 m³ of rough stone will be mined up to the depth of 18 m BGL in the five years. To achieve the estimated production, 3 jack hammers, 1 compressor, and 1 tipper will be deployed. To operate the machineries and to break the rough stone to preferred dimension, about 14 persons will be employed. At the end of the quarry life, the dimension of the ultimate pit will be 117 m*49 m*18 m and about 0.46.50 ha of land would have been quarried; about 0.02.0 ha of land would have been used for establishing infrastructures; about 0.04.0 ha of land would have been used for road development; about 0.20.00 ha of land would have been used for green belt development; about 0.10.00 ha of land would have been used for dump yard; and about 1.05.50 ha of land would have been left unutilized. The mine closure plan shows that about Rs.639200 with the annual recurring cost of Rs.56400 will be spent towards mine closure. Boundary coordinates of corner pillars of the project site and accessibility details to the location of the project site are given in Tables 2.1 & 2.2 respectively. The lease area of the project site overlaid on Google earth image is shown in Figure 2.1.

Table 2.1 Corner Geographic Coordinates of Proposed Project

Pillar ID	Latitude	Longitude	Pillar ID	Latitude	Longitude
1	11° 0'2.56"N	77°57'34.25"E	7	10°59'57.47"N	77°57'39.69"E
2	11° 0'1.76"N	77°57'35.98"E	8	10°59'58.12"N	77°57'32.82"E
3	11° 0'0.12"N	77°57'38.28"E	9	10°59'59.06"N	77°57'33.36"E
4	10° 59'59.38"N	77°57'38.80"E	10	11°0'0.30"N	77°57'33.51"E
5	10°59'57.87"N	77°57'39.28"E	11	11°0'0.86"N	77°57'33.47"E
6	10°59'57.73"N	77°57'39.68"E	12	11°0'1.40"N	77°57'33.57"E

Table 2.2 Site Connectivity to the Project Area

Type of Features	Name/Location	Distance (km)	Direction
Nearest Roadways	Erode-Karur (SH-84)	2.2	NE
	Karur-Vellakoil (NH-81)	2.22	W
Nearest Town	Karur	17	NE
Nearest Railway Station	Pugalur	6.7	NE
Nearest Airport	Coimbatore	100	W

2.3 DETAILS OF RESERVES

Reserves were calculated using cross-section method after leaving the safety distance as shown in Figure 2.2. Details of resources and reserves of the project are given in Table 2.3.

Table 2.3 Estimated Resources and Reserves of the Project

Resource Type	Rough Stone in m ³	Top Soil in m ³
Geological Resource in m ³	337160	1697
Mineable Reserves in m ³	15939	---
Proposed production for 5 years m ³	324479	---

Based on the year wise development and production plan and sections, as shown in Figures 2.3 & 2.3a, the year wise production results are given in Table 2.4.

Table 2.4 Year-Wise Production Details

Year	Rough Stone (m ³)	Gravel (m ³)
I	4500	-
II	4500	-
III	4500	-
IV	4500	-
V	4500	-
Total	22500	-

2.3 LAND USE PATTERN

Land use and land cover information for the proposed project site has been given in Table 2.5.

Table 2.5 Land use data at present, during scheme of mining, and at the end of mine life

Description	Present Area (ha)	Area at the end of life of quarry (ha)
Area under quarry	1.33.00	0.46.50
Infrastructure	Nil	0.02.00
Roads	0.03.0	0.04.00
Green Belt	Nil	0.20.00
Dump	0.10.0	0.10.00
Unutilized area	0.42.00	1.05.50
Total	1.88.00	1.88.00

Source: Approved mining plan

2.4 METHOD OF MINING

The quarrying operation is proposed to be carried out by opencast semi mechanized mining method involving drilling, blasting, and formation of benches. Machineries proposed for this project have been given in Table 2.6.

2.5 PROPOSED MACHINERY DEPLOYMENT

List of machineries proposed for the quarrying operation is given in Table 2.6.

Table 2.6 Proposed Machinery Deployments

S. No.	Type	No. of Unit	Capacity	Make	Motive Power
1	Jack Hammers	3	1.2 m to 2 m	---	Compressed Air
2	Compressor	1	400 psi	Atlas Copco	Diesel Drive
Haulage & Transport Equipment					
3	Tipper	1	15 tons	Benz	Diesel Drive

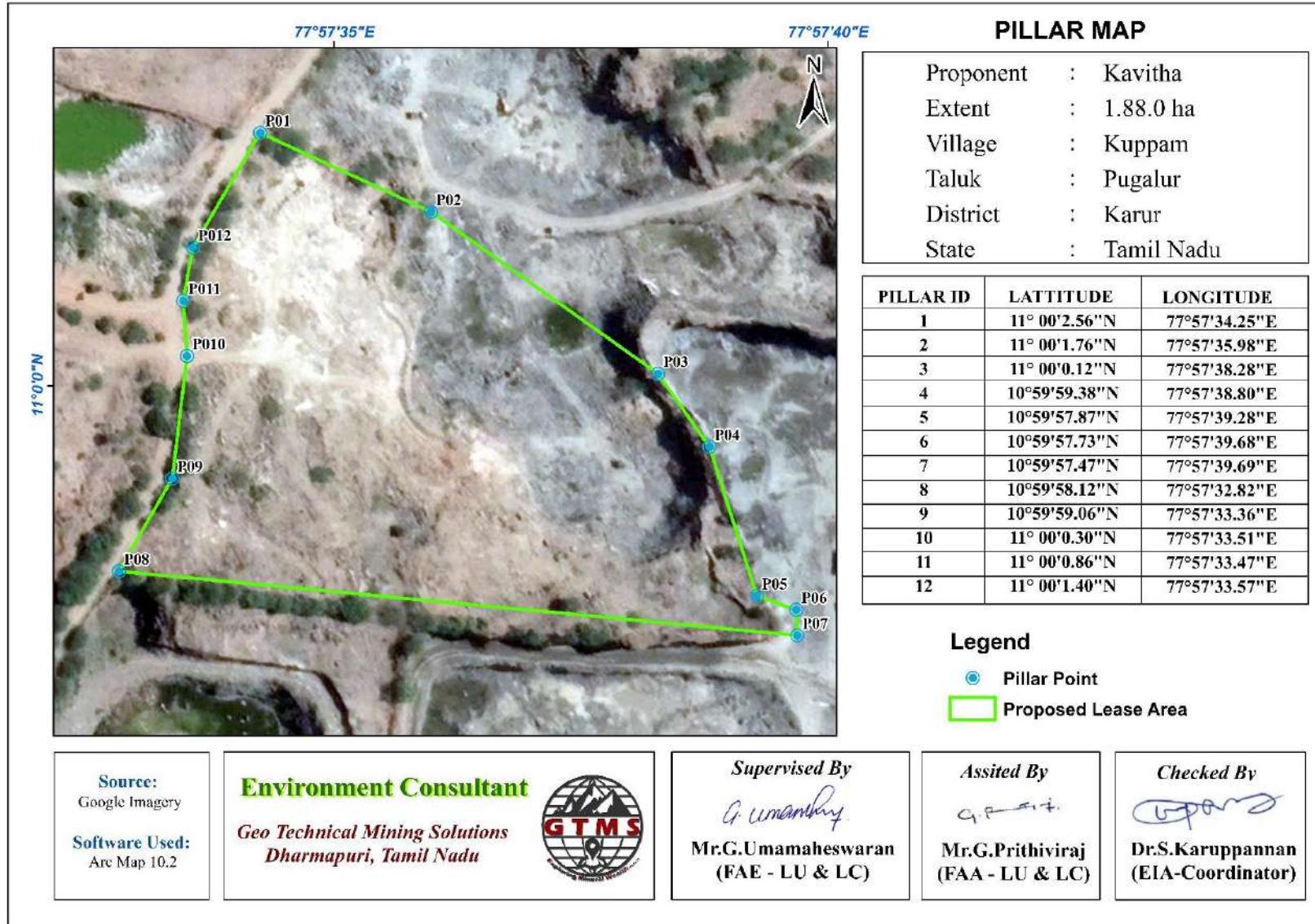


Figure 2.1 Google Earth Image Showing Lease Area with Pillars

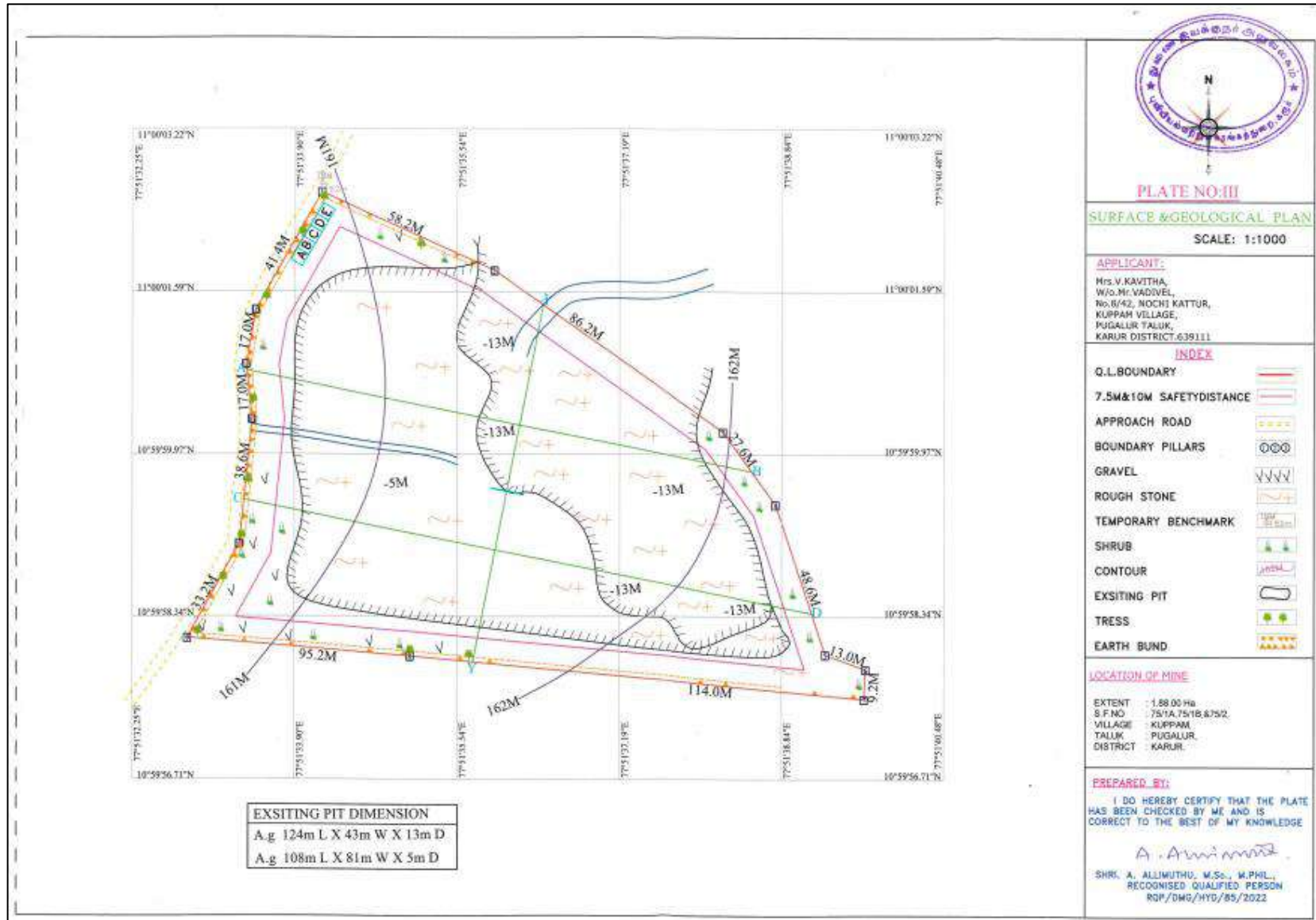


Figure 2.2 Mine Lease Plan

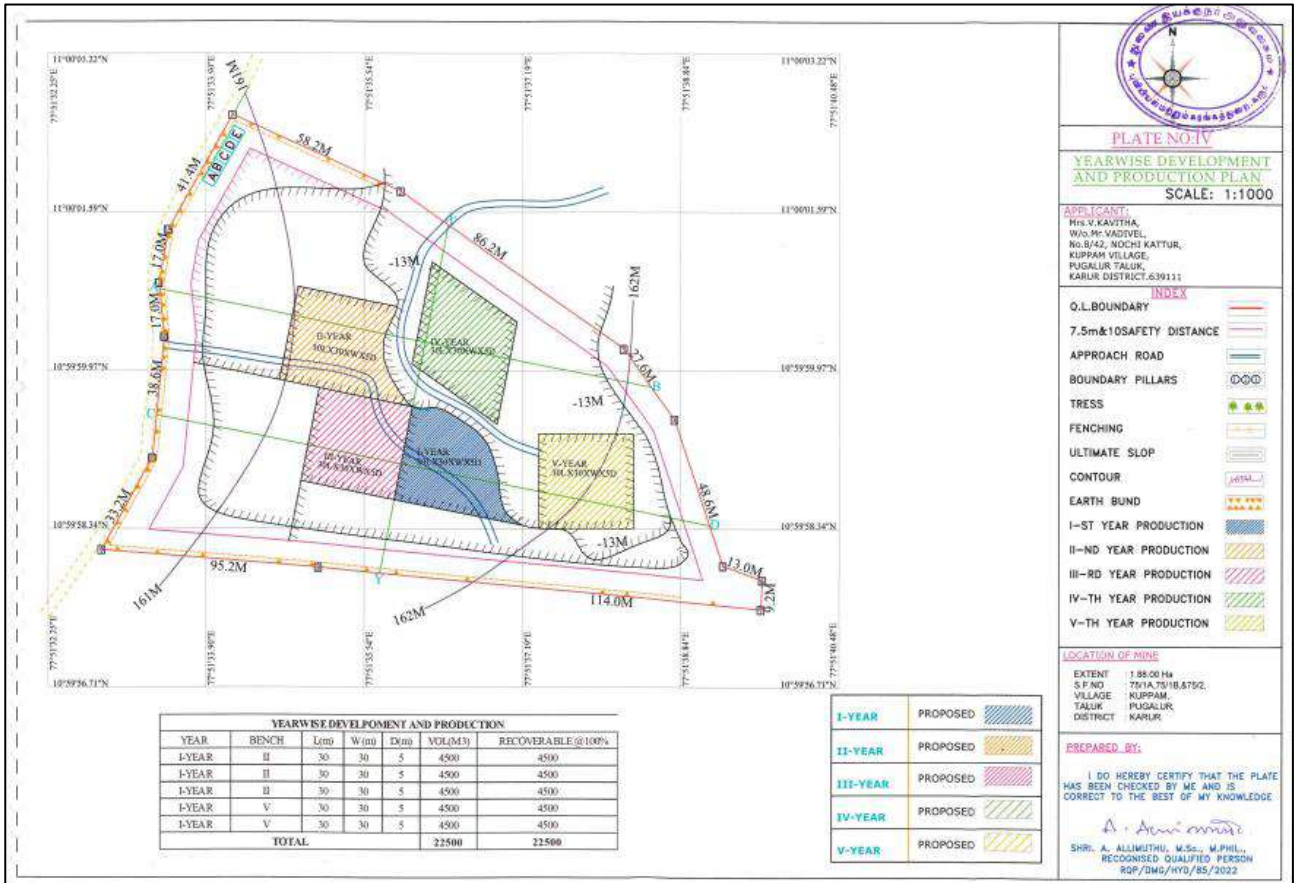


Figure 2.3 Yearwise development and production plan

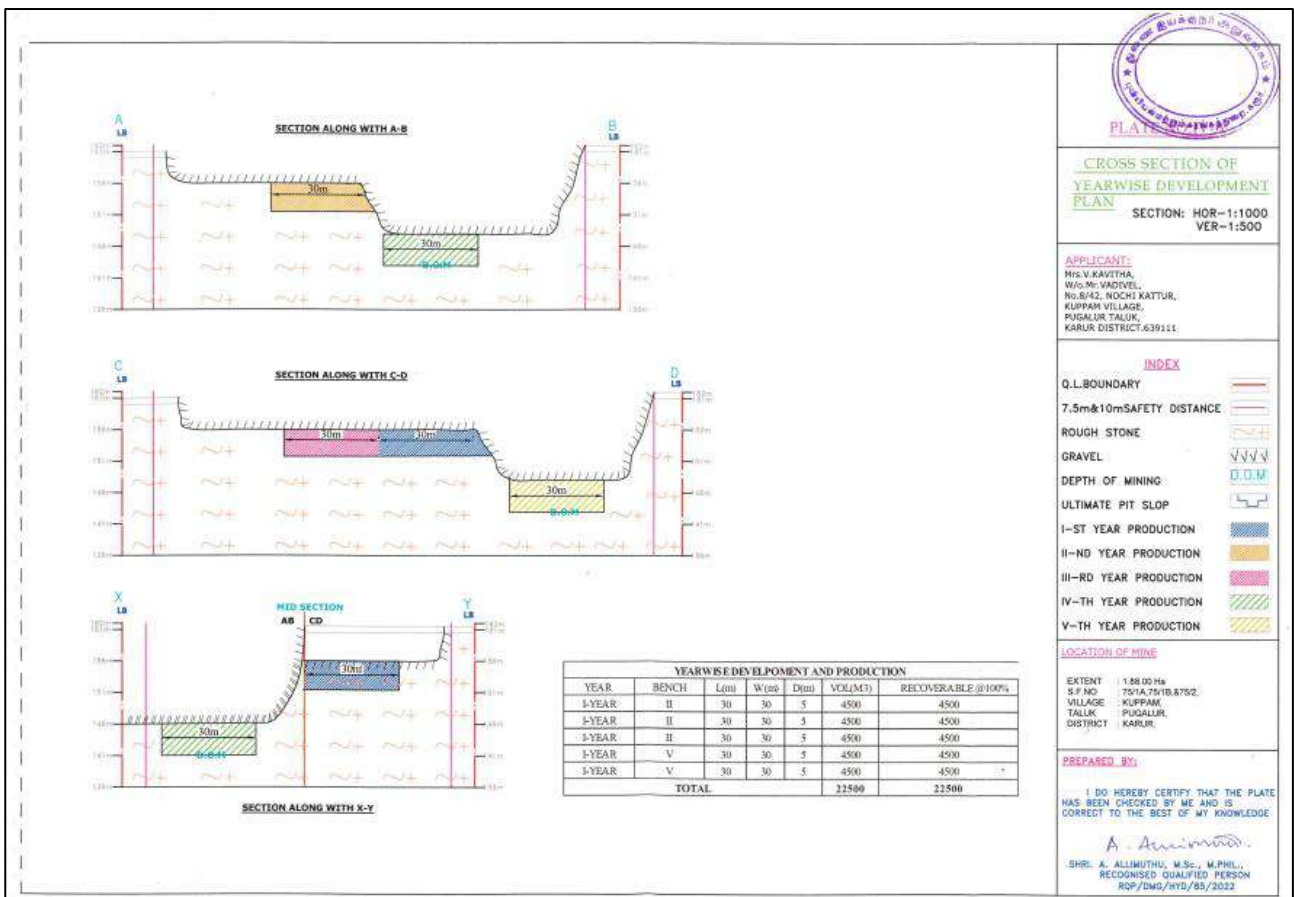


Figure 2.3a Yearwise development and production plan sections

2.5 CONCEPTUAL MINE CLOSURE PLAN

- ❖ Mine closure is a process of returning a disturbed site to its natural state for other productive uses to minimize adverse effects on the environment or threats to humans' health and safety.
- ❖ The objective of the mine closure plan is to transform quarries to be physically safe to humans and animals, geo-technically stable, geo-chemically non-polluting, and non-contaminating.
- ❖ At the end of mining life, the mine pit will act as an artificial reservoir for collecting rain water and will help to meet the water demand during drought season.
- ❖ After mine closure, the greenbelt will be developed along the safety barrier and over top benches. Water from the pit will be used to the greenbelt development and maintenance. Budgetary provision for mine closure is provided in Table 2.7.

Table 2.7 Mine Closure Budget

Activity	Capital Cost	Recurring Cost/Annum
376 plants inside the lease area	75200	11280
564 plants outside the lease area	169200	16920
Wire Fencing	376000	18800
Renovation of Garland Drain	18800	9400
Total	639200	56400

CHAPTER III

DESCRIPTION OF THE ENVIRONMENT

3.0 INTRODUCTION

Field monitoring studies were carried out to evaluate the existing environmental condition of the project site during October through December, 2022 as per CPCB guidelines. Environmental baseline data were collected by an NABL accredited and MoEF notified Excellence Laboratory for the environmental attributes including soil, water, noise, air and by FAEs for ecology and biodiversity, traffic, and socio-economy.

3.1 LAND ENVIRONMENT

Land use pattern of the area of 5 km radius was studied using Sentinel II imagery. LULC types and their extent are given in Table 3.1.

Table 3.1 Land Use / Land Cover Statistics for the Area of 5 km Radius

S. No.	Classification	Area(ha)	Area in %
1	Crop land	25434	84
2	Dense forest	653	2
3	Fallow land	361	1
4	Mining/Industrial land	371	1
5	Plantations	2146	7
6	Settlement	167	1
7	Water bodies	1049	3
	Total	30181	100

Source: Sentinel II Imagery

3.2 SOIL ENVIRONMENT

Ten locations were selected for soil sampling based on soil types, vegetative cover, and industrial & residential activities including infrastructure facilities. The physical and chemical characteristic results of soil samples are provided below.

Physical Characteristics

- ❖ The soil texture found in the study area is clay loam and sandy loam.
- ❖ pH of the soil varies from 6.09 to 7.26 indicating slightly alkaline nature.
- ❖ Electrical conductivity of the soil varies from 399 to 476 $\mu\text{s}/\text{cm}$ and
- ❖ The water content varies from 2.18 to 3.80 %.

Chemical Characteristics

- ❖ Nitrogen ranges between 76 and 141 mg/kg.
- ❖ Phosphorus ranges between 0.89 and 1.90 mg/kg.
- ❖ Potassium ranges between 240.3 and 334.9 mg/kg.
- ❖ Calcium ranges between 124 and 182 mg/kg.
- ❖ Magnesium ranges between 20.7 and 34.0 mg/kg.
- ❖ Sodium ranges between 322 and 538 mg/kg.
- ❖ Dry matter content ranges between 1.01 and 2.97.

3.3 WATER ENVIRONMENT

Surface Water

There are no surface water bodies present within the study area. Hence, data on surface water bodies are not collected for this project.

Ground Water Resources

Groundwater in the study area occurs in the crystalline rocks of Archaean age and recent alluvium. The movement of the groundwater is controlled by the intensity of weathering and fracturing of crystalline rocks. Dug wells and bore wells are the most common ground water abstraction structures in the area. However, in dry season, people in the study area heavily rely on bore wells for their domestic and agriculture purpose.

Eight groundwater samples were collected from open well and bore well and analyzed for physico-chemical conditions, heavy metals and bacteriological contents in order to assess baseline quality of ground water. Results for ground water samples indicate that the physical, chemical and biological parameters, and heavy metals are within permissible limits in comparison with standards of IS10500:2012.

Groundwater Levels and Flow Direction

Data regarding groundwater elevations were collected from 9 open wells and 9 bore wells at various locations within 2 km radius around the proposed project sites for the period from October through December, 2021 (Post-Monsoon Season) and from March through May, 2022 (Post Monsoon Season). Average depths to the static water table in open wells range from 14.4 to 17.2 m BGL in post monsoon and from 10.6 to 14.1 m BGL in pre monsoon. The average depths to static potentiometric surface in bore wells for the period of October through December, 2021 (Post-Monsoon Season) vary from 63.4 to 70.7 m and from 62.3 to 67.3 m for the period of March through May, 2022 (Pre-Monsoon Season). The groundwater flow studies indicate that in the two monsoon seasons groundwater flows towards the open well number 7 located NW and towards the bore well number 2 located North of the proposed project site.

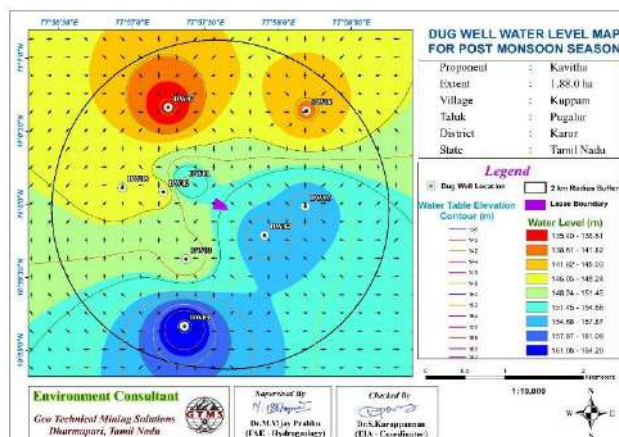


Figure 3.1 Open well static groundwater elevation map showing the direction of groundwater flow during post-monsoon season

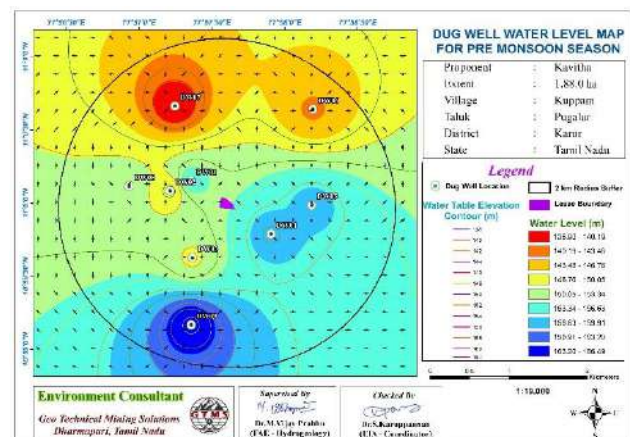


Figure 3.2 Open well static groundwater elevation map showing the direction of groundwater flow during pre-monsoon season

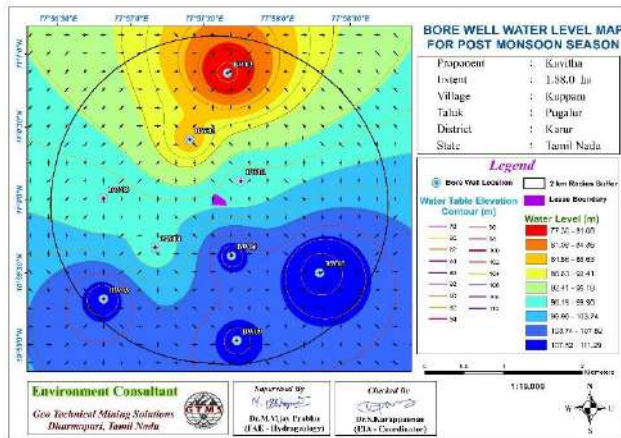


Figure 3.3 Borewell static groundwater elevation map showing the direction of groundwater flow during post-monsoon season

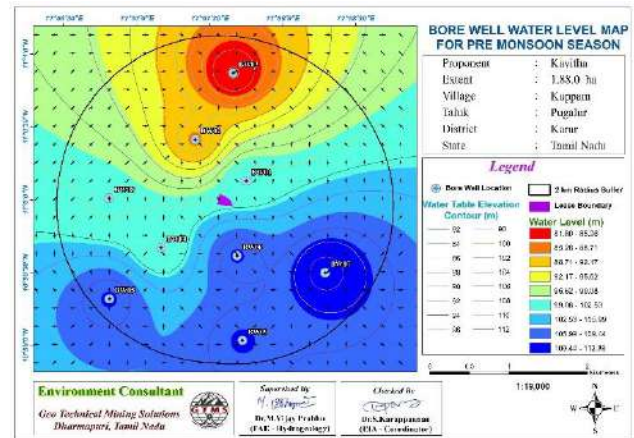


Figure 3.4 Borewell static groundwater elevation map showing the direction of groundwater flow during pre-monsoon season

Geophysical Investigation

The rock formation of low resistivity values indicates occurrence of water at the depth of about 55-60 m below ground level.

3.4 AIR ENVIRONMENT

The existing ambient air quality of the area is important for evaluating the impact of mining activities on the ambient air quality. The baseline studies on air environment include identification of specific air pollutants and their existing levels in ambient air. The ambient air quality in the study area of 5 km radius around the proposed quarry sites provides the baseline ambient air quality information.

Ambient Air Quality

As per the monitoring data, PM_{2.5} ranges from 20.66 µg/m³ to 23.58 µg/m³; PM₁₀ from 41.36 µg/m³ to 44.98 µg/m³; SO₂ from 6.04 µg/m³ to 7.96 µg/m³; NO₂ from 24.11 µg/m³ to 27.14 µg/m³. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

3.5 NOISE ENVIRONMENT

Noise level in core zone was 46.0 dB (A) Leq. during day time and 39.1 dB (A) Leq. during night time and noise levels in buffer zone varied from 40.1 to 47.2 dB (A) Leq. during day time and from 36.5 to 39.3 dB (A) Leq. during night time. Thus, the noise level for industrial and residential area meets the requirements of CPCB.

3.6 BIOLOGICAL ENVIRONMENT

The main objective of biological study is to collect the baseline data regarding flora and fauna in the study area and identify ecologically sensitive areas and whether there are any rare,

endangered, endemic or threatened (REET) species of flora and fauna in the core zone as well as buffer zone. From the study of biological environment, it is concluded that there was no schedule I species of animals observed within study area as per Wildlife Protection Act, 1972 and no species were found in vulnerable, endangered or threatened category as per IUCN and that there is no endangered red list species found in the study area.

3.7 SOCIO ECONOMIC ENVIRONMENT

Socio-economic study is an essential part of environmental study. It is a measure of an individual's or family's or group of people's economic and social position based on education, income, health, and occupation. Socio-economic most important determinant of livelihoods as levels of knowledge, skill and income conditions which mean for their living. The study 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 project will aim to provide preferential employment to the local people there by improving the employment opportunity in the area, which will in turn improve the social standards.

CHAPTER IV

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.0 INTRODUCTION

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 for sustainable resource extraction.

4.1 LAND ENVIRONMENT

Anticipated Impact

- Permanent impact on mineral resources due to removal of 22500 m³ of rough stone.
- Permanent or temporary change on land use and land cover.
- Change in topography of the mine lease area
- Problems to agricultural land and human habitations due to dust, and noise caused by movement of heavy vehicles
- Soil erosion and sediment deposition in the nearby water bodies due to earthworks during the rainy season.

Mitigation Measures

The mining activity will be progressively implemented along with other mitigative measures as discussed below:

- Garland drains will be constructed all around the quarry pit and a check dam will be constructed at the suitable location in lower elevations to prevent erosion due to surface runoff during heavy rainfall and to collect the storm water for various uses.
- Green belt will be developed in safety zone. The water stored in the quarry will be used for greenbelt.
- Thick plantation will be done on unutilized area, top benches, safety barrier, etc.,
- At conceptual stage, the land use pattern of the quarry will be changed into greenbelt area and temporary reservoir.
- Natural vegetation surrounding the quarry will be retained to minimize dust emissions.
- Proper fencing will be established at the conceptual stage and security will be posted round the clock to prevent inherent entry of the public and cattle.

4.2 SOIL ENVIRONMENT

Anticipated Impact

This project does not result in any impact on the soil of the project site, as topsoil is neither removed from the project site nor preserved in the safety margin area. However, some of the common mitigation measures have been discussed in the following sections to protect the immediate soil environment surrounding the lease area.

Mitigation Measures

- *Run-off diversion* – Garland drains will be constructed all around the project boundary to prevent surface flows from entering the quarry area. The water from garland drainage system will be discharged into vegetated natural drainage lines, or as distributed flow across an area stabilised against erosion.
- *Sedimentation ponds* - Run-off from working areas will be routed towards sedimentation ponds. These ponds trap sediments and reduce suspended sediment loads before runoff is discharged from the quarry sites. Sedimentation ponds will be designed based on runoff, retention times, and soil characteristics. There may be a need to provide a series of sedimentation ponds to achieve the desired outcome.
- *Retention of vegetation* – Retain existing vegetation or replant the vegetation at the site wherever possible.

- *Monitoring and maintenance* –Erosion control systems will be maintained to make sure seamless performance of the systems during rainy season.

4.3 WATER ENVIRONMENT

Anticipated Impact

- No water bearing structure is established in the lease area as the water required for the mining operations is obtained from the approved water supply company as given in Table 2.10. Instead, underground water storage systems are planned to be built around the quarries. Therefore, no impact responsible for the water table declination is anticipated.
- Surface and ground water resources may be contaminated due to mine pit water discharge, domestic sewage, waste water from vehicle washing, washouts from surface exposure or working areas, discharge of oil & grease, and suspended solids due to waste from washing of machineries. To address this impact, some of the important mitigation measures is provided as below.

Mitigation Measures

- Rainwater will be collected in the mine pit and settling tank of the dimension of 15m x 10m x 3m. The contaminated solids, if any, are removed from this water. The clear water is then stored in an overhead reservoir tank. Treated water will be used for dust suppression, green zone development and rainwater harvesting.
- A drainage network will be established which will be constructed around the leased area known as Garland drainage. This structure is used to divert surface water runoff to the green area.
- The quality of water in the quarry will be analysed periodically.
- Domestic sewage from site office and latrines in the mining site will be discharged to septic tanks followed by soak pits.
- Wastewater from the mining site will be treated in settling tanks before using it for dust suppression and tree plantation purposes.
- Desilting will be carried out before and immediately after the monsoon season.
- The quality of water in open and bore wells, and surface water bodies will be monitored regularly.

4.4 AIR ENVIRONMENT

Anticipated Impact

Emission of air pollutants such as particular matter (PM), gases such as sulphur dioxide, oxides of nitrogen at various stages of activities such as excavation, drilling, blasting and transportation of materials. The incremental concentration of pollutants is estimated in the following sections before providing mitigation measures.

Table 4.1 Incremental and Resultant PM_{2.5}

Station ID	Distance to core area (km)	Direction	PM _{2.5} concentrations (µg/m ³)			Comparison against air quality standard (60 µg/m ³)	Magnitude of change (%)	Significance
			Base line	Predicted	Total			
AAQ1	0.1	---	23.95	5.32	29.27	Below standard	22.21	Not significant
AAQ2	4.0	NW	20.02	0.5	20.52		2.50	
AAQ3	2.65	NE	25.25	1	26.25		3.96	
AAQ4	0.79	SW	20.96	1	21.96		4.77	
AAQ5	2.40	SW	22.14	0.5	22.64		2.26	
AAQ6	3.95	SW	19.34	0	19.34		0.00	
AAQ7	4.15	S	23.07	0	23.07		0.00	
AAQ8	3.80	E	20.67	0.5	21.17		2.42	

Table 4.2 Incremental and Resultant PM₁₀

Station ID	Distance to core area (km)	Direction	PM ₁₀ concentrations (µg/m ³)			Comparison against air quality standard (100 µg/m ³)	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	0.1	---	45.19	3.81	49	Below standard	8.43	Not significant
AAQ2	4.0	NW	40.00	0.5	40.5		1.25	
AAQ3	2.65	NE	46.74	1	47.74		2.14	
AAQ4	0.79	SW	41.98	1	42.98		2.38	
AAQ5	2.40	SW	43.74	0.5	44.24		1.14	
AAQ6	3.95	SW	41.02	0	41.02		0.00	
AAQ7	4.15	S	44.98	0.1	45.08		0.22	
AAQ8	3.80	E	41.50	0.1	41.6		0.24	

Table 4.3 Incremental & Resultant SO₂

Station ID	Distance to core area (km)	Direction	SO ₂ concentrations (µg/m ³)			Comparison against air quality standard (80 µg/m ³)	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	0.1	---	8.57	2.52	11.09	Below standard	29.40	Not significant
AAQ2	4.0	NW	8.40	0.8	9.20		9.52	
AAQ3	2.65	NE	9.07	0.5	9.57		5.51	
AAQ4	0.79	SW	6.97	0.5	7.47		7.17	
AAQ5	2.40	SW	5.69	0	5.69		0.00	
AAQ6	3.95	SW	5.74	0	5.74		0.00	
AAQ7	4.15	S	5.73	0	5.73		0.00	
AAQ8	3.80	E	5.49	0.05	5.54		0.91	

Table 4.4 Incremental & Resultant NO₂

Station ID	Distance to core area (km)	Direction	NO _x concentrations (µg/m ³)			Comparison against air quality standard (80 µg/m ³)	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	0.1	---	25.88	2.72	28.6	Below standard	10.51	Not significant
AAQ2	4.0	NW	25.86	0.1	25.96		0.39	
AAQ3	2.65	NE	26.58	0.5	27.08		1.88	
AAQ4	0.79	SW	25.61	0.5	26.11		1.95	
AAQ5	2.40	SW	26.43	0.1	26.53		0.38	
AAQ6	3.95	SW	25.76	0.02	25.78		0.08	
AAQ7	4.15	S	24.72	0.02	24.74		0.08	
AAQ8	3.80	E	25.10	0.1	25.2		0.40	

The values of cumulative concentration i.e., background + incremental concentration of pollutant in all the receptor locations are still within the prescribed NAAQ limits without effective mitigation measures. By adopting suitable mitigation measures, the pollutant levels in the atmosphere can be controlled further.

Mitigation Measures

- Water will be sprinkled on haul roads twice a day to avoid dust generation during transportation.
- 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.
- Rough stone will be properly covered with tarpaulin and transported during the day time.
- The speed of tippers plying on the haul road will be limited to below 20 km/hr to avoid generation of dust.
- Main source of gaseous pollution will be from vehicle used for transportation of mineral; therefore, weekly maintenance of vehicles and other machines will be done to improve combustion process and reduce the emission of pollutants.
- The 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 (Pollution Under Control) certificate.
- Trees will be planted all along the main haul roads and haul roads will often be levelled to prevent the generation of dust due to movement of tippers.
- Green belt of adequate width will be developed around the project areas.
- Dust masks will be provided to the workers and their use will be strictly monitored.
- Annual medical check-ups, trainings and campaigns will be arranged to create awareness about the importance of wearing dust masks among all mine workers and tipper drivers.
- Ambient air quality monitoring will be conducted six months once to assess the effectiveness of mitigation measures proposed for the projects.

4.5 NOISE ENVIRONMENT

Anticipated Impact

Table 4.5 Predicted Noise Incremental Values

Noise Monitoring Location	Distance From Project Site(m)	Baseline Noise Level (dBA)m During Day Time	Predicted Noise Level(dBA)	Total(dBA)
Core Zone	100	46.0	39.38	46.86
Nochikattur	310	40.2	29.55	40.56
Punnam Chatram	2550	46.8	11.25	46.80
Thalaiyeethupatti	850	47.0	20.79	47.01
Salipalaiyam	2450	46.8	11.60	46.80
Velayudampalaiyam	4000	47.2	7.34	47.20
Karudaiyampalaiyam	4150	40.1	7.02	40.10
Pavitrarn	4600	46.3	6.12	46.30
NAAQ Standards	Industrial Day Time - 75 dB (A) & Night Time- 70 dB (A) Residential Day Time -55 dB (A) & Night Time- 45 dB (A)			

Total noise level in all the sampling areas is well below the CPCB standards for industrial and residential areas. By adopting suitable mitigation measures, the noise levels due to the project can be controlled further.

Mitigation Measures

- ❖ Proper maintenance, oiling and greasing of machines will be done every week to reduce generation of noise.
- ❖ Silencers / mufflers will be installed in all machineries.
- ❖ Green belt will be developed around the project area and along the haul roads to minimize propagation of noise.
- ❖ Personal Protective Equipment (PPE) like ear muffs/ear plugs will be provided to the operators of heavy machines and persons working near the heavy machines and their use will be ensured through training and awareness.
- ❖ Regular medical check-up and proper training will be provided to personnel to create awareness about adverse noise level effects.

4.6 BIOLOGICAL ENVIRONMENT

Anticipated Impact

- ❖ None of the plants will be cut during operational phase of the projects.
- ❖ There shall be negligible air emissions or effluents from the project sites. Dust generation during loading will be a temporary effect and is not anticipated to affect the surrounding vegetation significantly.
- ❖ Most of the land in the buffer area consists of crop lands, grass patches and small shrubs. Hence, there will be no effect on the flora.
- ❖ Wildlife except few domestic animals, reptiles, hares and some common birds is not found in the cluster and its immediate surrounds because of lack of vegetal cover and surface water.

Mitigation Measures

The proposed projects will develop the green belt within the lease area, along roads and other vacant areas to provide a barrier between the source of pollution and the surrounding areas. Although the project will not lead to any tree cutting, it is proposed to improve the greenery of the locality by plantation. During green belt development, about 2420 saplings will be planted by the project proponent both inside and outside the lease area in about three months. For this program, Rs.629200 will be invested as capital and Rs.72600 excluding 5% inflation will be spent annually for green belt maintenance.

4.7 SOCIO ECONOMIC ENVIRONMENT

Anticipated Impact

- ❖ The project will generate employment for about 33 persons
- ❖ Dust generation from mining activity can have negative impact on the health of the workers and people in the nearby area.
- ❖ Approach roads can be damaged by the movement of tippers

Mitigation Measures

- ❖ Good maintenance practices will be adopted for plant machinery and equipment to avert potential noise problems.
- ❖ Green belt will be developed in and around the project sites as per Central Pollution Control Board (CPCB) guidelines.
- ❖ Appropriate air pollution control measure will be provided 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 the mines act and rules.
- ❖ Both the State and the Central governments will be benefited through financial revenues by way of royalty, tax, DMF, NMET etc. from the projects directly and indirectly.

4.8 OCCUPATIONAL HEALTH MEASURES

All the persons will undergo pre-employment and periodic medical examination.

Employees will be monitored for occupational diseases by conducting the following tests

- ❖ General physical tests
- ❖ Audiometric tests
- ❖ Full chest, X-ray, Lung function tests, Spiro metric tests
- ❖ Periodic medical examination – yearly
- ❖ Lung function test – yearly, those who are exposed to dust
- ❖ Eye test

Essential medicines will be provided at the site. The medicines and other test facilities will be provided at free of cost. The first aid box will be made available at the mine for immediate treatment. First aid training will be imparted to the selected employees regularly. The lists of first aid trained members shall be displayed at strategic places.

CHAPTER V

ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

The mineral deposits are site specific in nature; hence question of seeking alternate sites do not arise for the projects.

CHAPTER VI

ENVIRONMENT MONITORING PROGRAM

Regular monitoring program of environmental components is essential to take into account the changes in the environmental components as shown in Table 6.1. The Objectives of monitoring is:

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

Table 6.1 Post Environmental Clearance Monitoring Schedule

S. No.	Environment Attributes	Location	Monitoring		Parameters
			Duration	Frequency	
1	Air Quality	2 locations (1 core & 1buffer)	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 (1Core & 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 6 months	Physical and Chemical Characteristics
8	Greenbelt	Within the Project Area	Daily	Monthly	Maintenance

Source: Guidance of manual for mining of minerals, February 2010

6.2 BUDGETARY PROVISION FOR EMP

The cost in respect of monitoring of environmental components has been shown in Table 6.2.

Table 6.2 Environment Monitoring Budget

S. No.	Parameter	Capital Cost	Recurring Cost per annum
1	Air Quality	-	Rs. 60,000/-
2	Meteorology	-	Rs. 15,000/-
3	Water Quality	-	Rs. 20,000/-
4	Water Level Monitoring	-	Rs. 10,000/-
5	Soil Quality	-	Rs.20,000/-
6	Noise Quality	-	Rs.10,000/-
7	Vibration Study	-	Rs.1,50,000/-
8	Greenbelt	-	Rs.10,000/-
Total		-	Rs.2,95,000 /-

Source: Field Data

CHAPTER VII

ADDITIONAL STUDIES

7.1 RISK ASSESSMENT

Risk assessment is all about prevention of accidents and to take necessary steps to prevent it from happening. The methodology for the risk assessment is 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 assess the risk levels of those hazards in order to prioritize those that need an immediate attention. Further, mechanisms responsible for these hazards are identified and control measures are recorded along with pinpointed responsibilities. The whole quarry operation will be carried out under the direction of a qualified competent mine manager certified by the DGMS, Dhanbad.

7.2 DISASTER MANAGEMENT PLAN

The objective of the disaster management plan is to make use of the combined resources of the mine and the outside services to:

- ❖ Rescue and treat 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

- The results on the cumulative impact of the two proposed projects on air environment of the cluster do not exceed the permissible limits set by CPCB for air pollutants.
- The cumulative results of noise for the habitation in consideration do not exceed the limit set by CPCB for residential areas for day time.
- PPV resulting from two proposed projects involving controlled blasting is well below the permissible limit of Peak Particle Velocity of 8 mm/s.
- The six proposed projects will allocate Rs.30,00,000/- towards CER as recommended by SEAC.
- The six proposed projects will directly provide jobs to about 130 local people.
- The proposed projects will plant about 4933 saplings in and around the lease area.

- The proposed projects will add 186 PCU per day to the nearby roads for the first three years and 129 PCU per day for the next two years.

7.4 PLASTIC WASTE MANAGEMENT PLAN

The Project Proponent shall comply with Tamil Nadu Government Order (Ms) No. 84 Environment and Forest (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.

Objective

- To investigate the actual supply chain network of plastic waste.
- To identify and propose a sustainable plastic waste management by installing bins for collection of recyclables with all the plastic waste
- Preparation of a system design layout, and necessary modalities for implementation and monitoring.

Table 7.1 Action Plan to Manage Plastic Waste

S. No.	Activity	Responsibility
1	Framing of Layout Design by incorporating provision of the Rules, user fee to be charged from waste generators for plastic waste management, penalties/fines for littering, burning plastic waste or committing any other acts of public nuisance	Mines Manager
2	Enforcing waste generators to practice segregation of bio-degradable, recyclable and domestic hazardous waste	Mines Manager
3	Collection of plastic waste	Mines Foreman
4	Setting up of Material Recovery Facilities	Mines Manager
5	Segregation of Recyclable and Non-Recyclable plastic waste at Material Recovery Facilities	Mines Foreman
6	Channelization of Recyclable Plastic Waste to registered recyclers	Mines Foreman
7	Channelization of Non-Recyclable Plastic Waste for use either in Cement kilns, in Road Construction	Mines Foreman
8	Creating awareness among all the stakeholders about their responsibility	Mines Manager
9	Surprise checking's of littering, open burning of plastic waste or committing any other acts of public nuisance	Mine Owner

CHAPTER VIII

PROJECT BENEFITS

Various benefits are envisaged due to the proposed mine and benefits anticipated from the proposed project to the locality, neighbourhood, region and nation as a whole are:

- ❖ Direct employment to 14 local people
- ❖ Rain water harvesting structures to augment the water availability for irrigation and plantation and ground water recharge
- ❖ Creation of community assets (infrastructure) like school buildings, village roads/ linked roads, dispensary & health Centre, community Centre, market place etc.,
- ❖ Strengthening of existing community facilities through the Community Development Program
- ❖ Skill development & capacity building like vocational training
- ❖ Awareness program and community activities, like health camps, medical aids, sports & cultural activities, plantation etc.,
- ❖ CSR activities mainly contributing to education, health, training of women self-help groups and infrastructure etc., will be taken up in the Kuppam Village. CSR budget is allocated as 2.5% of the profit.
- ❖ Rs. 5,00,000 will be allocated for CER.

CHAPTER IX

ENVIRONMENT MANAGEMENT PLAN

In order to implement the environmental protection measures, an amount of Rs.18,68,000 as capital cost and recurring cost as Rs.11,10,270 as recurring cost/annum is proposed considering present market price considering present market scenario for the proposed project. After the adjustment of 5% inflation per year, the overall EMP cost for 5 years will be Rs. 80,02,943.

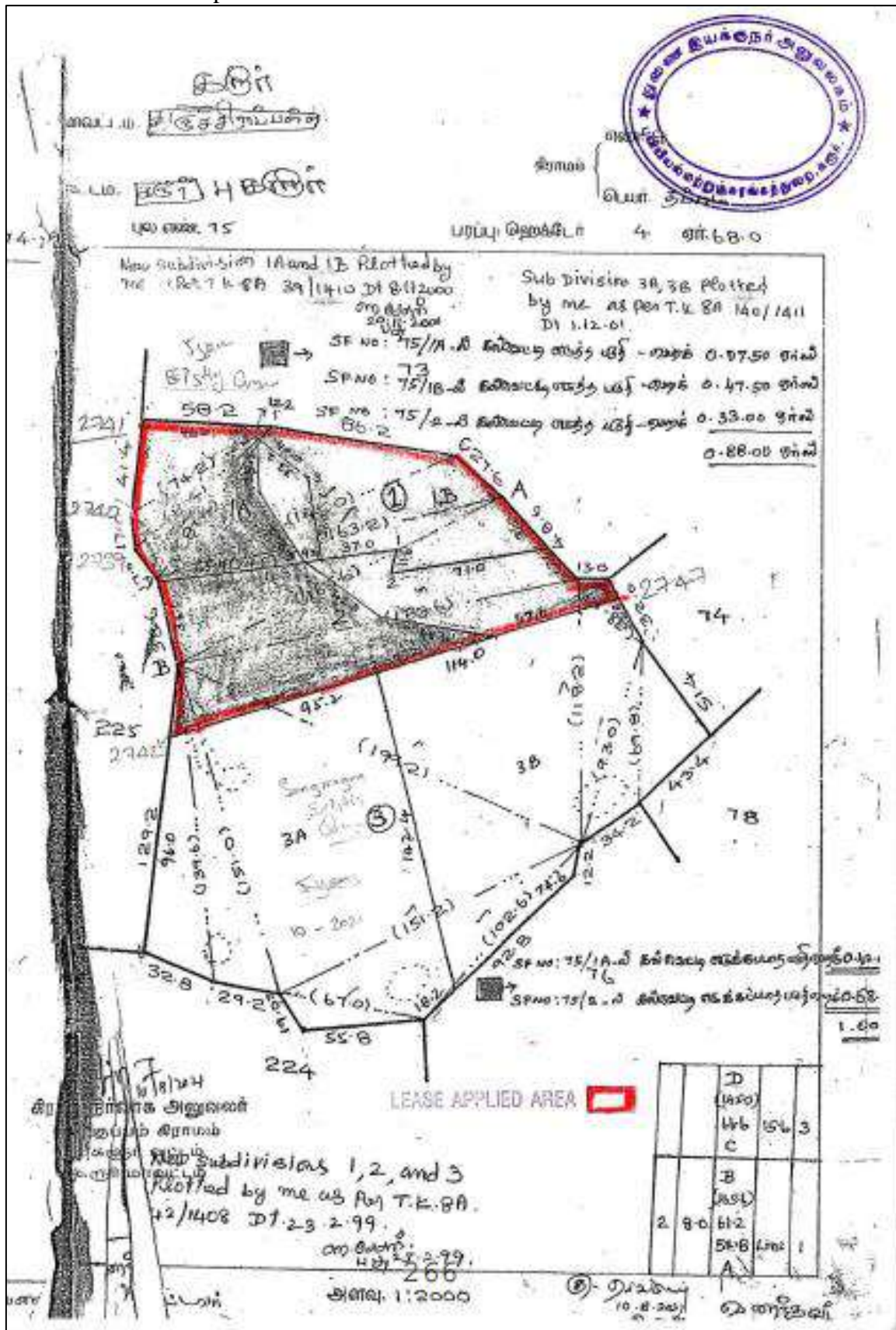
CHAPTER X

CONCLUSION

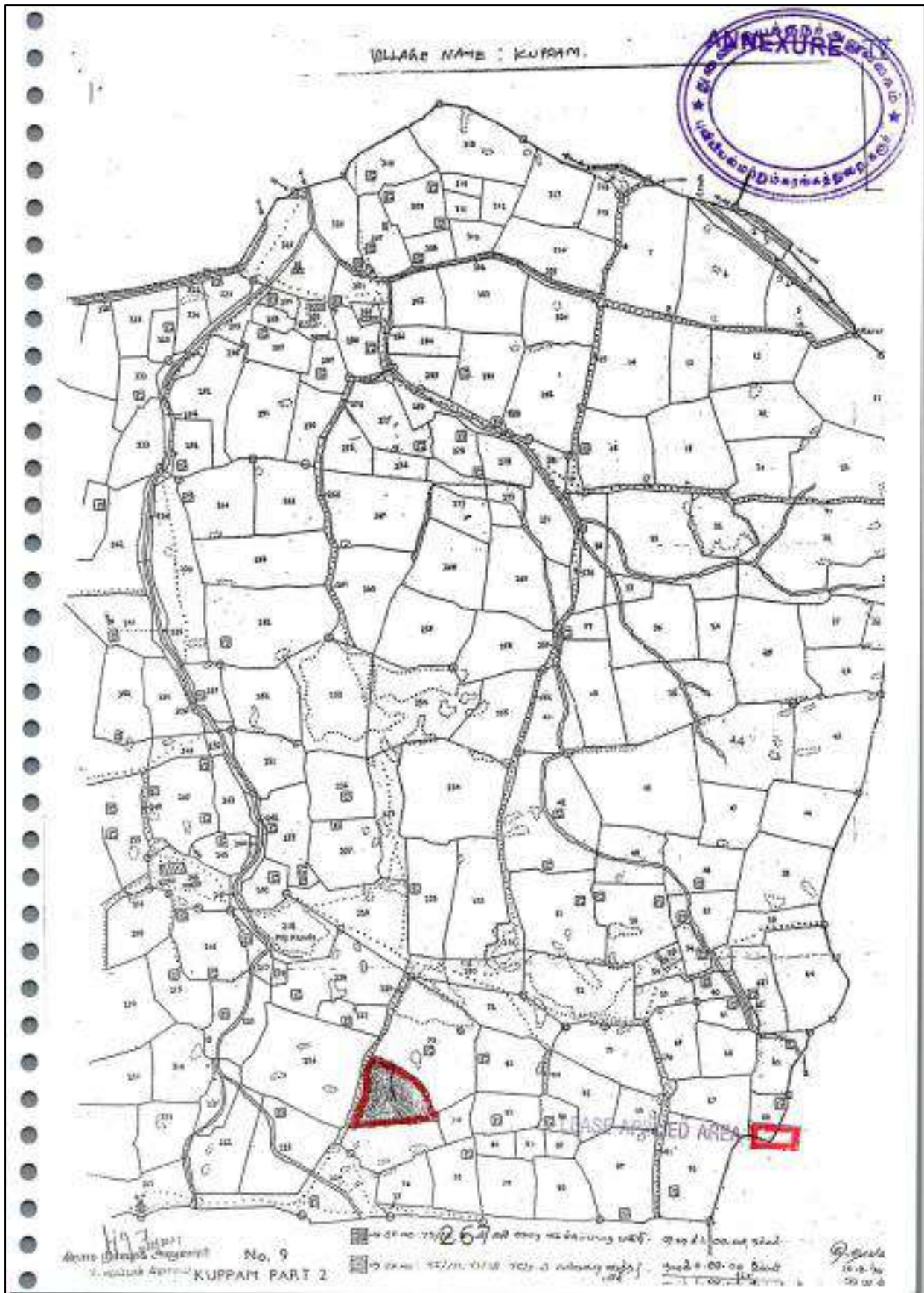
Various aspects of mining activities were considered and related impacts were evaluated. Considering all the possible ways to mitigate the environmental issues, environmental management plan (EMP) was prepared and fund has been allocated for the same. The EMP is dynamic, flexible and subjected to periodic review. For project where the major environmental impacts are associated, EMP will be under regular review. Senior management responsible for the project will conduct a review of EMP and its implementation to ensure that the EMP remains effective and appropriate. Thus, the proper steps will be taken to accomplish all the goals mentioned in the EMP and the project will bring the positive impact in the study area.

LAND DOCUMENTS

Some of the important land related documents are shown in below.



An FMP sketch showing proposed lease area in red colour



An Village map showing proposed lease area in red colour

13
A. Annexure 3, 2008.

ANEXURE

1	2	3	4	5	6	7	8	9	10	
69	69	...	...	...	...	...	...	...	...	93
70	70	...	...	...	...	...	...	...	...	...
71	71-A	...	...	...	...	...	...	...	...	214
	B	...	...	...	...	...	...	...	...	226
72	72	...	...	...	...	...	...	...	...	...
73	73-A	...	...	...	...	...	...	...	...	615
	B	...	...	...	...	...	...	...	...	615
74	74	...	...	...	...	...	...	...	...	615
75	75	...	...	...	...	...	...	...	...	615
76	76	...	...	...	...	...	...	...	...	616
77	77	...	...	...	...	...	...	...	...	617
	78	...	...	...	...	...	...	...	...	617

268

ANEXURE

73-A	73-A	...	...	...	...	...	...	...	...	615
A2	73-A	...	...	...	...	...	...	...	...	...
75-1	75-1	...	...	...	...	...	...	...	...	...
2	75-1	...	...	...	...	...	...	...	...	...
3	75-1	...	...	...	...	...	...	...	...	...
71	71	...	...	...	...	...	...	...	...	...
75-1A	75-1A	...	...	...	...	...	...	...	...	...
1B	75-1A	...	...	...	...	...	...	...	...	...
75-3B	75-3B	...	...	...	...	...	...	...	...	...
76-1	76-1	...	...	...	...	...	...	...	...	...
77	77	...	...	...	...	...	...	...	...	...
A1B	A1B	...	...	...	...	...	...	...	...	...

A Register Document



அ-பதிவேடு விவரங்கள்

மாவட்டம் : கரூர்
வட்டம் : புகளூர்
கிராமம் : குப்பம்

1. புல எண்	75	9. மண் வயனமும் ரகமும்	8 - 2
2. உட்பிரிவு எண்	1A	10. மண் தரம்	4
3. பழைய புல உட்பிரிவு எண்	75-1	11. தீர்வை (ரூ - ரெடி)	2,77
4. பகுதி	P	12. பரப்பு (ஹெக்டேர் - சது)	0 - 49.50
5. அரசு / ரயத்துவாரி ரயத்துவாரி		13. மொத்த தீர்வை (ரூ - ரெடி)	1,40
6. நிலத்தின் வகை	புஞ்சை	14. பட்டா எண்	1389
7. பாசன ஆதாரம்	-	15. குறிப்பு	-
8. இடு பொருள்	1	16. பெயர்	1.கவிதா

குறிப்பு 1:



நெடுகண்ட, தகவல் / சான்றிதழ் தகவல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டன. இவற்றை தாங்கள் <http://eservices.tn.gov.in> என்ற இணைய தளத்தில் 70861 என்ற குறிப்பு எண்ணை உள்ளிடு செய்து உறுதி செய்துகொள்ளவும்.



அ-பதிவேடு விவரங்கள்

மாவட்டம் : கரூர்
வட்டம் : புகளூர்
கிராமம் : குப்பம்

1. புல எண்	75	9. மண் வயனமும் ரகமும்	8 - 2
2. உட்பிரிவு எண்	1B	10. மண் தரம்	4
3. பழைய புல உட்பிரிவு எண்	75	11. தீர்வை (ரூ - ரெடி)	2,77
4. பகுதி	P	12. பரப்பு (ஹெக்டேர் - சது)	0 - 47.50
5. அரசு / ரயத்துவாரி ரயத்துவாரி		13. மொத்த தீர்வை (ரூ - ரெடி)	1,30
6. நிலத்தின் வகை	புஞ்சை	14. பட்டா எண்	1375
7. பாசன ஆதாரம்	-	15. குறிப்பு	-
8. இடு பொருள்	-	16. பெயர்	1.வடிவேல்

குறிப்பு 1:



நெடுகண்ட, தகவல் / சான்றிதழ் தகவல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டன. இவற்றை தாங்கள் <http://eservices.tn.gov.in> என்ற இணைய தளத்தில் 70826 என்ற குறிப்பு எண்ணை உள்ளிடு செய்து உறுதி செய்துகொள்ளவும்.



அ-பதிவேடு விவரங்கள்

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வட்டம் : புகளூர்
கிராமம் : குப்பம்

1. புல எண்	75	9. மண் வயனமும் ரகமும்	8 - 2
2. உட்பிரிவு எண்	2	10. மண் தரம்	4
3. பழைய புல உட்பிரிவு எண்		11. தீர்வை (ரூ - ரெடி)	2,77
4. பகுதி	P	12. பரப்பு (ஹெக்டேர் - சது)	0 - 91.00
5. அரசு / ரயத்துவாரி ரயத்துவாரி		13. மொத்த தீர்வை (ரூ - ரெடி)	2,52
6. நிலத்தின் வகை	புஞ்சை	14. பட்டா எண்	1389
7. பாசன ஆதாரம்	-	15. குறிப்பு	-
8. இடு பொருள்	-	16. பெயர்	1.கவிதா

குறிப்பு 1:



நெடுகண்ட, தகவல் / சான்றிதழ் தகவல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டன. இவற்றை தாங்கள் <http://eservices.tn.gov.in> என்ற இணைய தளத்தில் 70861 என்ற குறிப்பு எண்ணை உள்ளிடு செய்து உறுதி செய்துகொள்ளவும்.

30 - ஆம் பரவலில் கீழ்க்கண்ட 148-ஆம் கட்டிட திட்டம்

1	2	3	4	5	6	குறுகிய சாலைகள்			
						7	8	9	10
75	14	149	289	கந்தியா	சாலை				
	15	150	300	வினாயகம்	சாலை				
	2	151	300	கந்தியா	சாலை				

Handwritten signature and official stamp of the local authority.

S.P. 11-8-10-20,00,000 Cap.-587-A/66-7-2014

நகர் 2 இயக்குகிற தலைவர் துறை அமைப்பு பற்றிய தகவல் தரப்படும் திட்டம்

சாலைகள் குறிப்பு					7	8
1	2	3	4	5		
சாலை அமைப்பின் விவரம்	சாலை அமைப்பின் பரப்பளவு	சாலை அமைப்பின் கட்டிடப்பணியின் நிலை	சாலை அமைப்பின் நிர்வாகி	சாலை அமைப்பின் மதிப்பு	சாலை அமைப்பின் நிலம்	சாலை அமைப்பின் நிலம்

