

# EXECUTIVE SUMMARY

## AJJANAHALLI BLACK GRANITE QUARRIES

Ajjanahalli Village, Pennagaram Taluk, Dharmapuri District, Tamil Nadu State

**“B1” CATEGORY/ MINOR MINERAL/CLUSTER/ NON-FORESTLAND /GOVERNMENT LAND**

**CLUSTER EXTENT = 8.14.0 ha**

**ToR Obtained vide**

**P1-Lr.No. SEIAA-TN/F.No.8673/SEAC/TOR-1160/2022 Dated: 06.06.2022**

**P2-Lr.No. SEIAA-TN/F.No.8650/SEAC/TOR-1231/2022 Dated: 24.08.2022**

S.No	Name of the Owner	S.F. Nos	Extent
P1	Tvl. Tamilkumaran	830 (Part) West & 835/3	3.14.0 ha
P2	M/s. PVI Trading Corporation	830 (Part) East & 834/1	5.00.0 ha



**Environmental Consultant**



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**Baseline Monitoring Period – December 2022 to February 2023**

**Environmental Lab**

**EHS 360 LABS PRIVATE LIMITED**

(Approved by ISO/IEC 17025:2017)

10/2, Ground Floor, 50th Street,

7th Avenue, Ashok Nagar,

Chennai – 600 083, Tamil Nadu, India

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

## 1.0 INTRODUCTION

Granite is the major requirement for construction and ornamental stone industries. This EIA report is prepared for Tvl. Tamilkumaran Productions Private Limited (P1) Black Granite Quarry in S.F. No 830 (Part) West & 835/3 over an extent of 3.14.0 ha in Ajjanahalli Village, Pennagaram Taluk, Dharmapuri District and M/s. PVI Trading Corporation (P2) Black Granite Quarry in S.F.No. 830 (Part) East & 834/1 over an extent of 5.00.0 ha in Ajjanahalli Village, Pennagaram Taluk, Dharmapuri District.

This EIA report is prepared by considering Cumulative load of proposed & existing quarries within a radius of 500 m from this proposal. Consisting of Two Proposed Quarries with total extent of Cluster of 8.14.0 ha; the cluster area is calculated as per MoEF & CC Notification S.O. 2269(E) Dated 1st July 2016.

Environmental Impact Assessment (EIA) study is a process, used to identify the Environmental, Social and Economic impacts of a project prior to decision-making. EIA systematically examines both beneficial and adverse consequences of the proposed project and ensure that these impacts are taken into account during the project designing.

This EIA Report is prepared in compliance with ToR obtained vide letter No for P1 - Lr.No. SEIAA-TN/F.No.8673/SEAC/TOR-1160/2022 Dated: 06.06.2022 and for P2-Lr.No. SEIAA-TN/F.No.8650/SEAC/ TOR-1231/2022 Dated: 24.08.2022.

The Baseline Monitoring study has been carried out during Pre-Monsoon (December 2022 to February 2023) considering the provisions of MoEF & CC Office Memorandum Dated: 29.08.2017 and MoEF & CC Notification S.O. 996 (E) Dated: 10.04.2015..

### **“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 Proponent	Tvl. Tamilkumaran Productions Private Limited	M/s. PVI Trading Corporation
Address	No. 16/8, Bagavandham Street, Good Will Court, T.Nagar, Chennai.	D.No. 62-A, 1st Pulikuthi Street, Gugai, Salem.
State	Tamil Nadu	Tamil Nadu
Pin code	600 017	636 006
Mobile No	+91 99949 28999	+91 99444 56001

## 1.2 QUARRY DETAILS WITHIN 500 M RADIUS

CODE	Name of the Owner	S.F. Nos	Extent	Status
P1	Tvl. Tamilkumaran Productions Private Limited No. 16/8, Bagavandham Street, Good Will Court, T.Nagar, Chennai, Tamil Nadu – 600 017.	830 (Part) West & 835/3	3.14.0	Lr.No. SEIAA- TN/F.No.8673/SEAC/TOR- 1160/2022 Dated: 06.06.2022.
P2	M/s. PVI Trading Corporation D.No. 62-A, 1st Pulikuthi Street, Gugai, Salem, Tamil Nadu, India, Pin Code – 636 006.	830 (Part) East & 834/1	5.00.0	Lr.No. SEIAA- TN/F.No.8650/SEAC/TOR- 1231/2022 Dated: 24.08.2022.
<b>TOTAL CLUSTER EXTENT</b>			<b>8.14.0Ha</b>	

## 1.3 SALIENT FEATURES OF THE PROPOSAL

P1 - Tvl. Tamilkumaran Productions Private Limited				
Name of the Project	Tvl. Tamilkumaran Productions Private Limited Black Granite Quarry			
Toposheet No	57 H/16			
Latitude between	12°03'10.06"N to 12°03'18.69"N			
Longitude between	77°48'18.20"E to 77°48'30.42" E			
Highest Elevation	Elevated terrain altitude ranges from 412m to 472m AMSL			
Proposed Depth of Mining	23m AGL (1m Topsoil + 2m Weathered Rock + 20 m Black Granite)			
Existing Pit Dimension	Pit 1 – 14m (L) x 13m (W) x 3m (D) Pit 2 – 12m (L) x 12m (W) x 3m (D)			
Resources	ROM (m <sup>3</sup> )	Side burden (m <sup>3</sup> )	Weathered rock (m <sup>3</sup> )	Topsoil (m <sup>3</sup> )
Geological Resources	1,64,400	3,94,120	55,200	27,600
Mineable Resources	73,845	33,290	22,054	12,332
Year wise Production Resources	18,375	14,400	22,054	12,332
Ultimate Pit Dimension	Pit: 316m (L) x 62m (W) x 23m (D) agl			
Water Level measured in the surrounding area	56 - 61m bgl			
Method of Mining	Opencast Mechanized Mining Method involving drilling and blasting			
Topography	The area is an elevated terrain situated in slope of hillock. The gradient is 1 in 6 towards Southeastern side and altitude of the area is ranges from 412 to 472m above from MSL. The area is concealed under reddish gravelly soil having an average thickness 1m, 2m weathered rock and followed by fresh black granite.			
Machinery proposed	Wagon Drill	1		
	Jack Hammer	4		
	Compressor	1		
	Diamond Wire Saw	1		
	Diesel Generator	1		
	Crawler Crane	1		
	Excavator	1		
	Tipper	1		
Blasting method	Controlled blasting using Small dia slurry explosives only for overburden and weathered rock removal			
Proposed Manpower Deployment	25 Nos			
Project Cost	Rs 7,72,01,000/-			
CER Cost	Rs.5,00,000/-			
Nearby Water Bodies	Kaveri River	6km West		
	Moongilmaduvu Dam	2.5km East		
	Mettuankottai Dam	5km South East		
	Mathalapallam Dam	6.5km South		

	Odai	7km South
	Tank	9km North East
Greenbelt Development Plan	Proposed to plant 1500 trees in Safety Zone, approach and Village roads.	
Proposed Water Requirement	5.5 KLD	
Nearest Habitation	460m North	
<b>P2 - M/s. PVI Trading Corporation</b>		
Name of the Project	M/s. PVI Trading Corporation	
Toposheet No	57 H/16	
Latitude between	12°03'06.1265"N to 12°03'17.3265"N	
Longitude between	77°48'28.5887"E to 77°48'39.5422" E	
Highest Elevation	Elevated terrain altitude ranges from 382m to 436m AMSL	
Proposed Depth of Mining	25m agl	
<b>Resources</b>	<b>ROM (m<sup>3</sup>)</b>	<b>Side burden (m<sup>3</sup>)</b>
Geological Resources	3,08,250	11,20,090
Mineable Resources	1,48,525	1,91,505
Year wise Production Resources	37,125	99,440
Ultimate Pit Dimension	Pit: 217m (L) x 117m (W) x 50m (D) (30m agl + 20m bgl)	
Water Level measured in the surrounding area	56 - 61m bgl	
Method of Mining	Opencast Mechanized Mining Method involving drilling and blasting	
Topography	The area is an elevated terrain situated in slope of hillock. The gradient is 1 in 6 towards southeastern side and altitude of the area is ranges from 382m to 436m above from MSL. The area is concealed under 3m weathered rock and followed by fresh black granite.	
Machinery proposed	Jack Hammer	4
	Compressor	2
	Diamond Wire Saw	2
	Line Drilling Machinery	2
	Excavator	1
	Tipper	2
Blasting method	Controlled blasting using Small dia slurry explosives only for overburden and weathered rock removal	
Proposed Manpower Deployment	27 Nos	
Project Cost	Rs 6,09,70,000/-	
CER Cost	Rs.5,00,000/-	
Nearby Water Bodies	Kaveri River	6km West
	Moongilmaduvu Dam	2.5km East
	Mettuankottai Dam	5km South East
	Mathalapallam Dam	6.5km South
	Odai	7km South
	Tank	9km North East
Greenbelt Development Plan	Proposed to plant 2500 trees in Safety Zone, approach and Village roads.	
Proposed Water Requirement	4.5 KLD	
Nearest Habitation	460m North	

Source: Approved Mining Plan

## 1.4 STATUTORY DETAILS

### P1 - Tvl. Tamilkumaran Productions Private Limited

- Dharmapuri District Gazette Extraordinary issue in English and Tamil No. 5 on Dated 03.09.2020.
- Precise area communication letter received for the preparation of Mining plan vide Letter No. 273/MME.2/2021-1, Dated 23.02.2021.
- Mining plan got approved by the Commissioner of Geology and Mining, Chennai vide Rc.No. 6163/MM4/2020, Dated 21.05.2021.
- Proponent applied for ToR to get Environmental Clearance vide online Proposal No. SIA/TN/MIN/65944/2021 Dated: 23.07.2021

### P2 - M/s. PVI Trading Corporation

- Dharmapuri District Gazette Extraordinary issue in English and Tamil No. 5 on Dated 03.09.2020.
- Precise area communication letter received for the preparation of Mining plan vide Letter No. 272/MME.2/2021-1, Dated 22.02.2021.
- Mining plan got approved by the Commissioner of Geology and Mining, Chennai vide Rc.No. 6162/MM4/2020, Dated 21.05.2021.
- Proponent applied for ToR to get Environmental Clearance vide online Proposal No. SIA/TN/MIN/64515/2021 Dated: 07.07.2021.

## 2.0 PROJECT DESCRIPTION

The area is fresh land, no mining activities carried out before, Topography of the area is elevated terrain with gentle gradient towards Southeast side. No major vegetation or trees within the project area, the project is site specific and there is no additional area required for this project. There is no effluent generation/discharge from the proposed quarry.

Black Granite is proposed to quarry by opencast mechanized method involving Eco-friendly Diamond Wire Saw Cutting. Heavy earth moving machineries like Excavators Trucks will be deployed in this quarrying operation for Granite exploitation. Shot hole drilling with controlled blasting using slurry explosives for removal of overburden and Weathered portions during initial stage of quarry operation.

### 2.1 SITE CONNECTIVITY TO THE PROJECT AREA

<b>P1 - Tvl. Tamilkumaran Productions Private Limited</b>	
<b>Nearest Roadway</b>	Village road 270m South West (NH 44) Salem – Bangalore – 28km – South East (SH 60) Hogenakkal - Pennagaram – 8km North
<b>Nearest Village</b>	Sigaralahalli – 1.5km- NW
<b>Nearest Town</b>	Pennagaram - 13.0km-NE
<b>Nearest Railway Station &amp; Railway Line</b>	Mettur Railway Station - 29km - South Mettur to Salem – 29km - South
<b>Nearest Airport</b>	Salem Airport - 57.0Km - SE
<b>Seaport</b>	Chennai 291Km NE
<b>P2 - M/s. PVI Trading Corporation</b>	
<b>Nearest Roadway</b>	Village road 460m North East

	(NH 44) Salem – Bangalore – 28km – South East (SH 60) Hogenakkal - Pennagaram – 8km North
<b>Nearest Village</b>	Ajjanahalli – 1.5km- NE
<b>Nearest Town</b>	Pennagaram - 13.0km-NE
<b>Nearest Railway Station &amp; Railway Line</b>	Mettur Railway Station - 29km - South Mettur to Salem – 29km - South
<b>Nearest Airport</b>	Salem Airport - 57.0Km – SE
<b>Seaport</b>	Chennai 291Km NE

## 2.2 LAND USE PATTERN OF THE LEASE APPLIED AREA

<b>P1 - Tvl. Tamilkumaran Productions Private Limited</b>			
<b>Description</b>	<b>Present Area (Ha)</b>	<b>Area to be required during this Mining Plan period (Ha)</b>	<b>Area at the end of life of quarry (Ha)</b>
Area under quarry	0.03.2	1.20.2	1.20.2
Waste dump	Nil	0.26.0	0.36.0
Infrastructure	Nil	0.01.0	0.01.0
Roads	Nil	0.03.0	0.03.0
Green Belt	Nil	0.14.0	0.50.0
Stocking blocks	3.10.8	1.49.8	1.03.8
<b>TOTAL</b>	<b>3.14.0</b>	<b>3.14.0</b>	<b>3.14.0</b>
<b>P2 - M/s. PVI Trading Corporation</b>			
<b>Description</b>	<b>Present Area (Ha)</b>	<b>Area to be required during this Mining Plan period (Ha)</b>	
Area under quarrying	Nil	0.79.0	
Infrastructure	Nil	0.02.0	
Roads	Nil	0.03.0	
Unutilized	5.00.0	2.74.5	
Waste dump	-	1.16.5	
Green belt	Nil	0.25.0	
<b>TOTAL</b>	<b>5.00.0</b>	<b>5.00.0</b>	

## 2.3 OPERATIONAL DETAILS OF LEASE APPLIED AREA

<b>P1 - Tvl. Tamilkumaran Productions Private Limited</b>						
<b>Description</b>	<b>ROM in m<sup>3</sup></b>	<b>Granite Recovery @ 10 % in m<sup>3</sup></b>	<b>Granite Waste @ 90 % in m<sup>3</sup></b>	<b>Side Burden in m<sup>3</sup></b>	<b>Weathered rock in m<sup>3</sup></b>	<b>Topsoil in m<sup>3</sup></b>
Geological Resources	1,64,400	16,440	1,47,960	3,94,120	55,200	27,600
Mineable Reserves	73,845	7,385	66,460	33,290	22,054	12,332
Mining Plan Period Production	18,375	1,837	16,538	14,400	22,054	12,332
Number of Working Days	300 Days					
Production per day	12	1	11	10	37	21
No of Lorry loads (6m <sup>3</sup> per load)	2	1	2	2	6	6
<b>P2 - M/s. PVI Trading Corporation</b>						
<b>Description</b>	<b>ROM</b>	<b>Granite</b>	<b>Granite</b>	<b>Side</b>	<b>Weathered</b>	

	in m <sup>3</sup>	Recovery @ 10 % in m <sup>3</sup>	Waste @ 90 % in m <sup>3</sup>	Burden in m <sup>3</sup>	rock in m <sup>3</sup>
Geological Resources	3,08,250	30,825	2,77,425	11,20,090	1,43,820
Mineable Reserves	1,48,525	14,853	1,33,673	1,91,505	54,057
Mining Plan Period Production	37,125	3,713	33,413	99,440	18,252
Number of Working Days	300 Days				
Production per day	25	2	22	66	61
No of Lorry loads (6m <sup>3</sup> per load)	6	1	6	11	10

FIGURE 2.2: GOOGLE IMAGE SHOWING PROJECT AREA P1

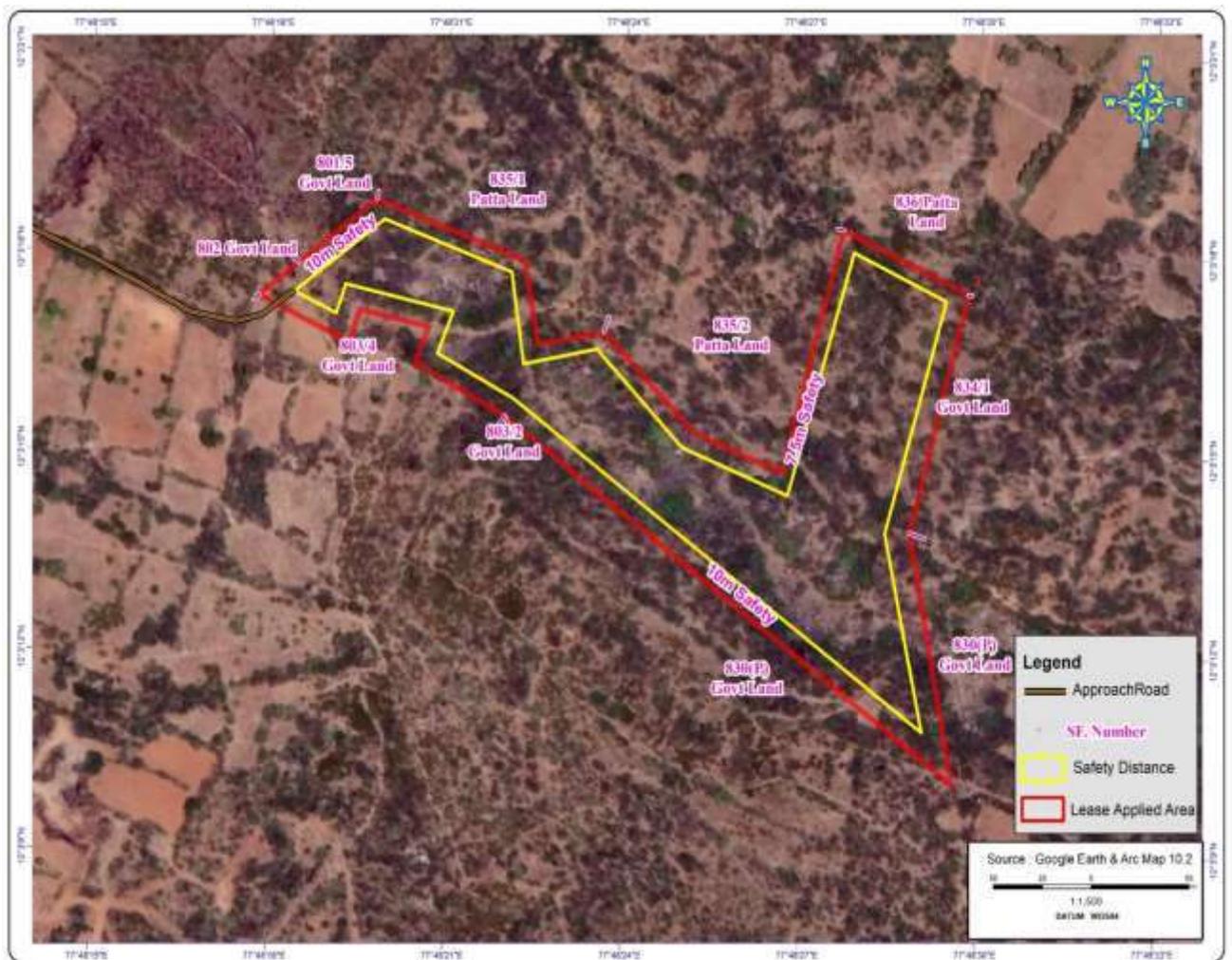
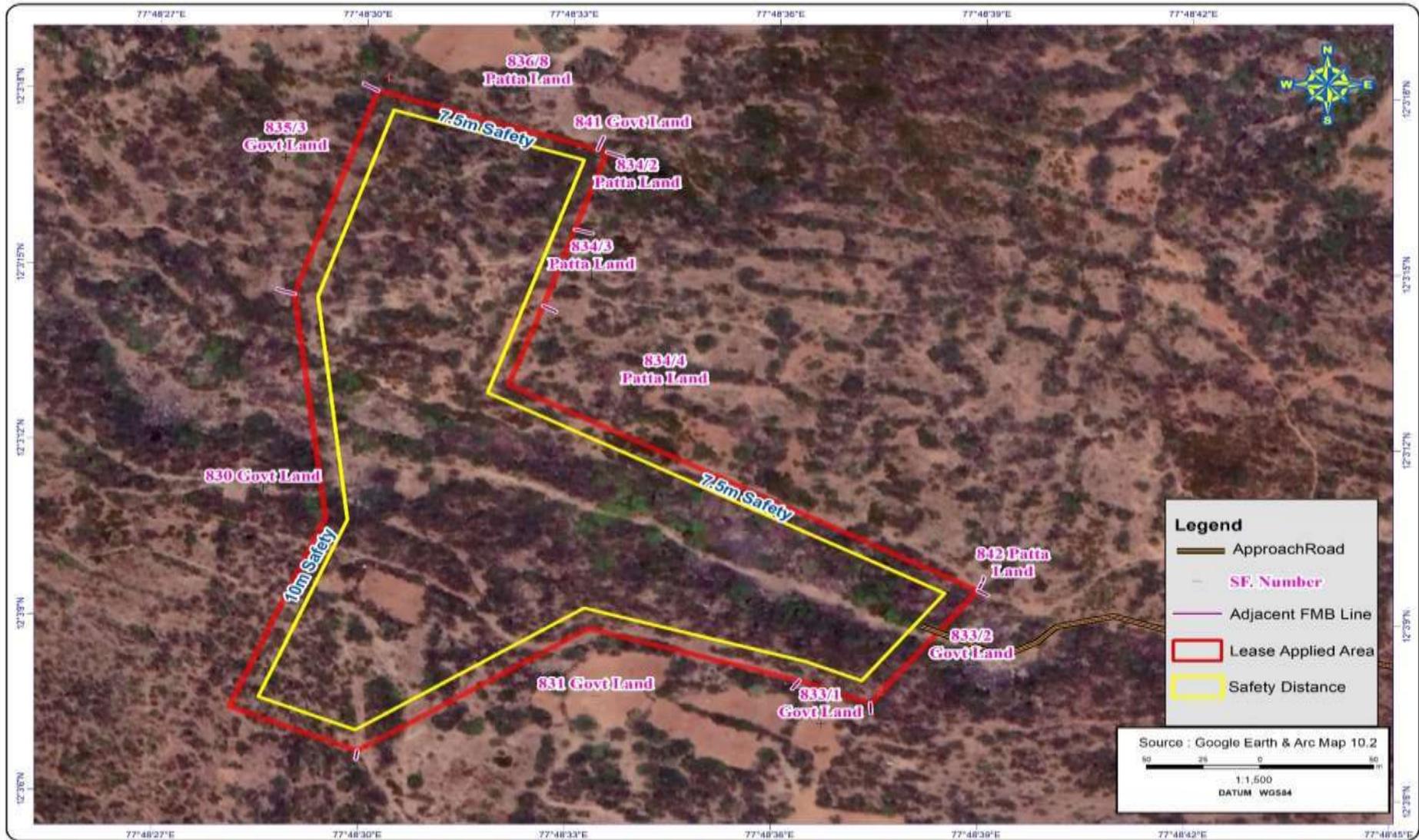
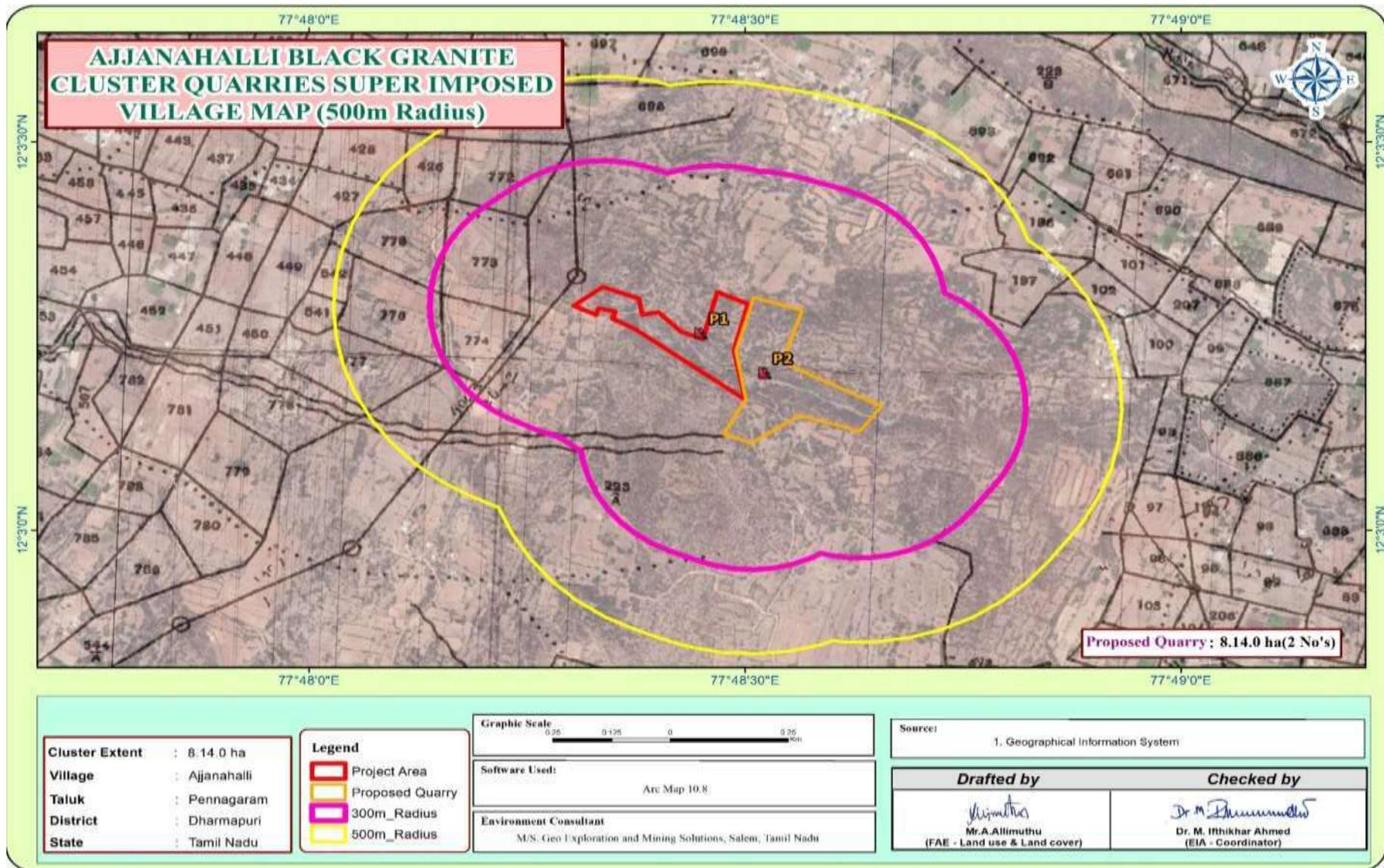


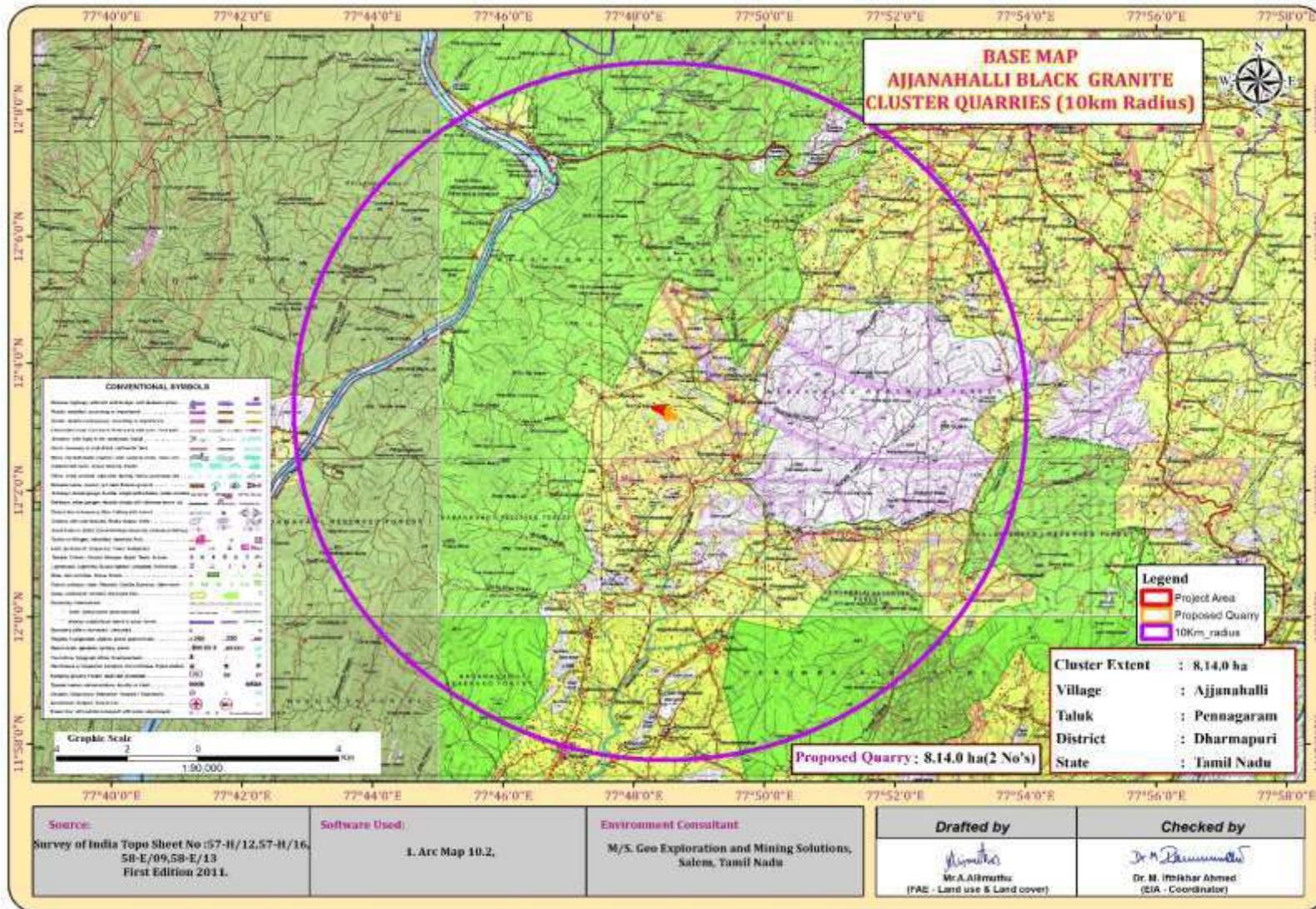
FIGURE 2.2A: GOOGLE IMAGE SHOWING PROJECT AREA P2



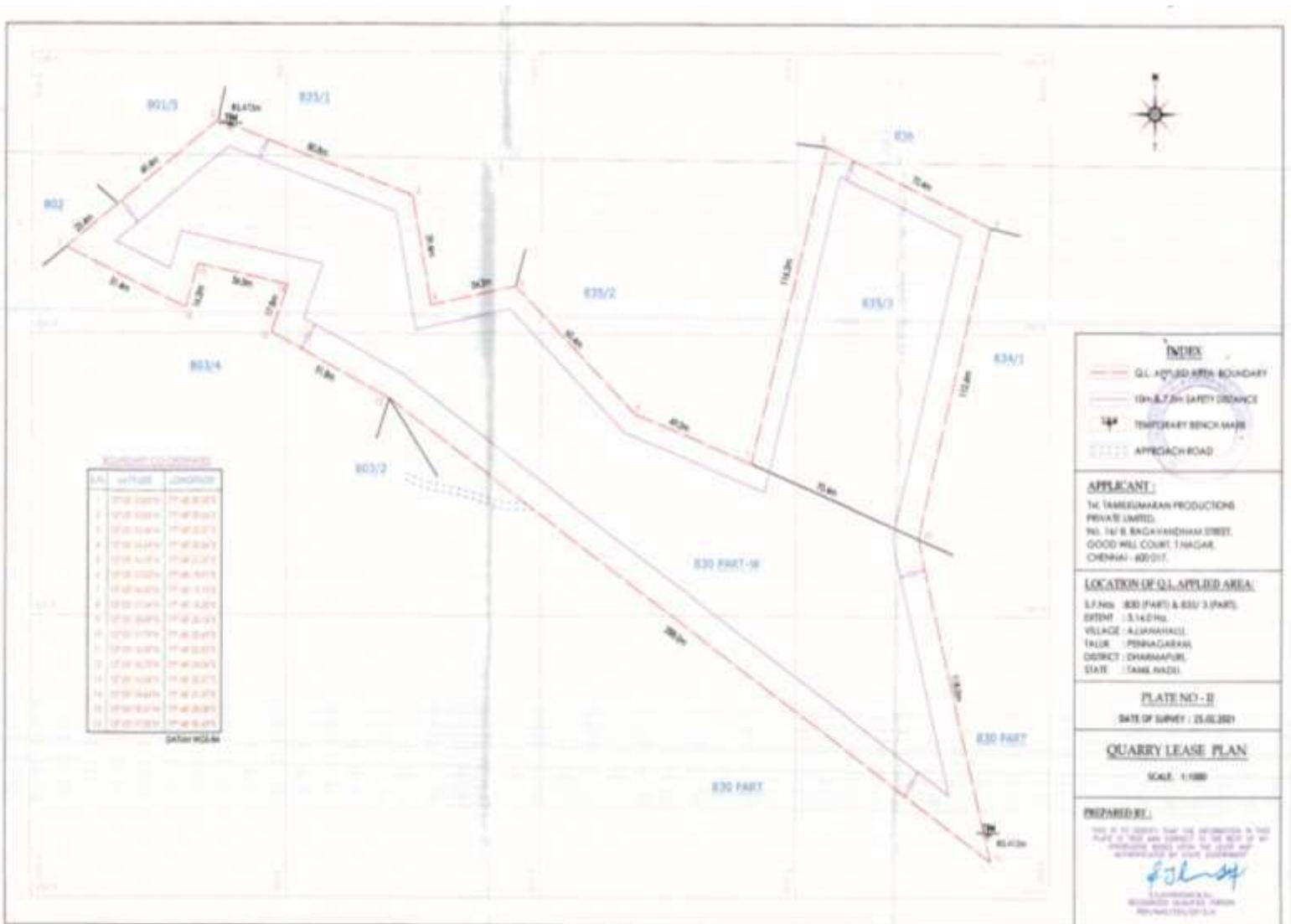
**FIGURE – 2: GOOGLE IMAGE SHOWING CLUSTER (500 m QUARRIES)**



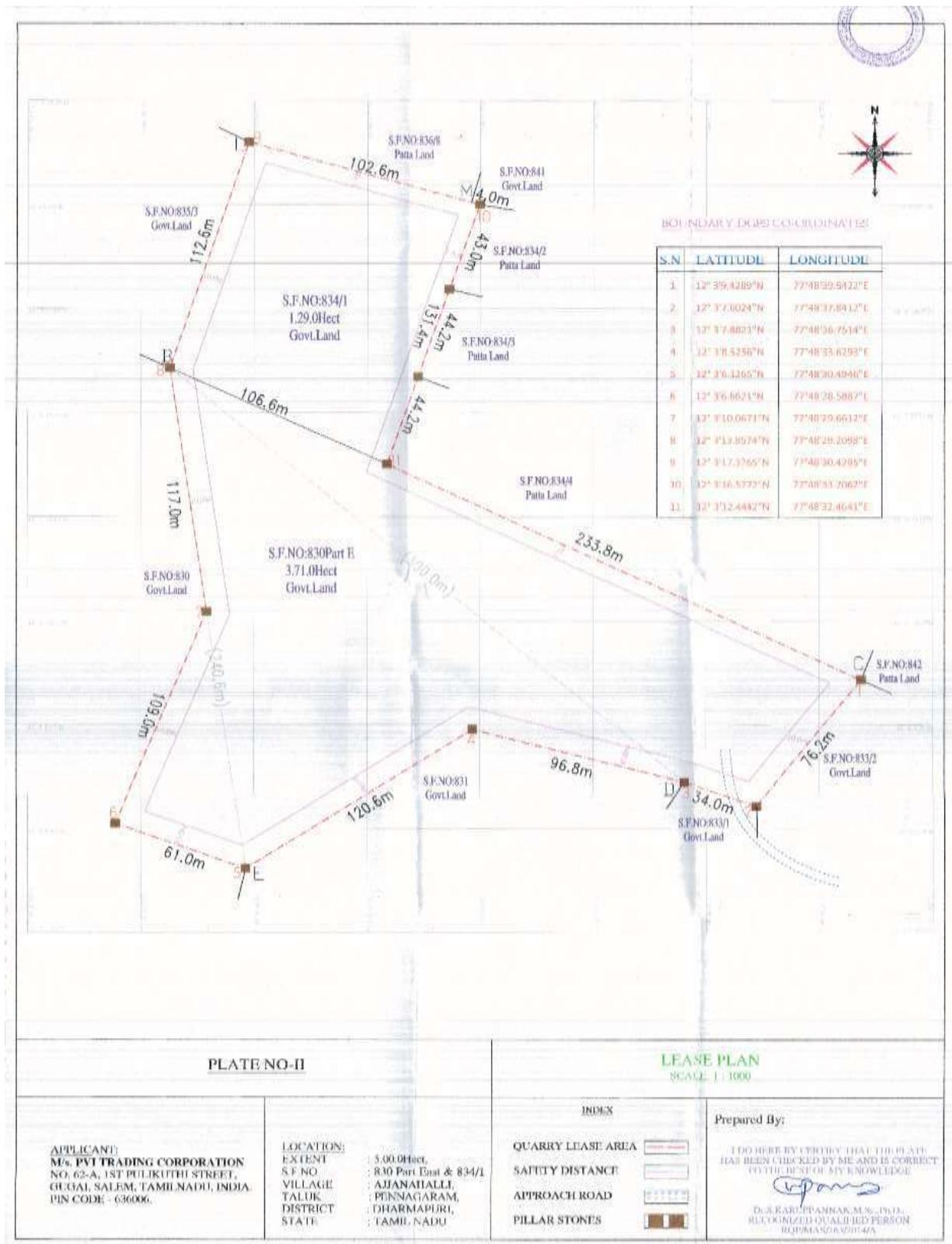
**FIGURE – 3: TOPOSHEET MAP COVERING 10 KM RADIUS**



**FIGURE – 4: QUARRY LEASE PLAN & SURFACE PLAN- P1**



**FIGURE – 4.1: QUARRY LEASE PLAN & SURFACE PLAN - P2**



**FIGURE – 5: PHOTOGRAPHS OF THE PROJECT AREA P1**



**FIGURE – 5.1 PHOTOGRAPHS OF THE PROJECT AREA P2**



## 2.4 METHOD OF MINING

- ❖ The method of mining is Opencast mechanized method
- ❖ Eco-friendly dimensional wire saw cutting for liberation and splitting up of blocks from parent sheet rocks
- ❖ Splitting of rock body of considerable volume from the parent rock formation by carefully avoiding visibly seen defects such as patches veins, etc., is done by adopting the method of “Diamond wire cutting” along the horizontal as well as two vertical sides on the front face of the formation.
- ❖ Jackhammer drilling with 32mm dia, this huge portion is further split into several blocks of required dimensions, only slurry explosives are used for secondary fragmentation and handling of waste.
- ❖ Hydraulic Excavator coupled with tippers is deployed for the formation of benches and loading
- ❖ There is no mineral processing or ore beneficiation proposed
- ❖ Proposed bench height is 5m and 5m width with 90° slope
- ❖ The waste material generated during quarrying activity includes rock fragments of different sizes, and waste chips during dressing of the blocks. The waste materials are taken in tippers and proposed to be dumped in the respective approved places earmarked for the purpose and the same will be utilized for backfilling in the northern side of the lease area during conceptual stage..

## 2.5 PROPOSED MACHINERY DEPLOYMENT

### Drilling Equipment's

P1 - Tvl. Tamilkumaran Productions Private Limited					
Drilling Equipment's					
Type	No of Unit	Dia of Hole mm	Size capacity	Make	Motive Power
Wagon Drill	1	32	60HP	TAM Rock	Diesel
Jack Hammer	4	32	1.2m to 6m	Atlas Copco	Compressed air
Compressor	1	-	140cfm/400psi	Atlas Copco	Diesel drive
Diamond wire saw	1	-	20m <sup>3</sup> /day	Optima	Diesel Generator
Diesel generator	1	-	125kva	Powerica	Diesel
Loading Equipment					
Type	No of Unit	Capacity	Make	Motive Power	
Crawler Crane	1	855	Tata P & H	Diesel Drive	
Excavator	1	300	Tata Hitachi	Diesel Drive	
Haulage within the Mine & Transport Equipment					
Type	No of Unit	Capacity	Make	Motive Power	
Tipper	1	20 tonnes	Tata	Diesel Drive	

<b>P2 - M/s. PVI Trading Corporation</b>					
<b>Drilling Equipment's</b>					
Type	No of Unit	Dia of Hole mm	Size capacity	Make	Motive Power
Jack Hammer	4	32	110cfm	Atlas Copco	Compressed air
Compressor	2	-	600cpm	-	Diesel Drive
<b>Loading Equipment</b>					
Type	No of Unit	Capacity	Make	Motive Power	
Excavator	1	180	Tata Hitachi	Diesel Drive	
<b>Haulage within the Mine &amp; Transport Equipment</b>					
Type	No of Unit	Capacity	Make	Motive Power	
Tipper	2	15 tonnes	BMW	Diesel Drive	

## 2.6 CONCEPTUAL MINING PLAN/ FINAL MINE CLOSURE PLAN

Conceptual mining plan is prepared with an object of long-term systematic development of benches, lay outs, selection of permanent ultimate pit limit, depth of quarrying and ultimate pit, selection of sites for construction of infrastructure etc. The ultimate pit size is designed based on certain practical parameters such as economical depth of quarrying, safety zones, permissible area etc.,

## 2.7 ULTIMATE PIT DIMENSION

P1	<b>Length in m</b>	<b>Width in m</b>	<b>Depth in m</b>
	316	62	23m agl
P2	<b>Length in m</b>	<b>Width in m</b>	<b>Depth in m</b>
	217	117	50m (30m agl + 20m bgl)

## 3.0 DESCRIPTION OF THE ENVIRONMENT

This chapter presents a regional background to the baseline data at the very onset, which will help in better appreciation of micro-level field data, generated on several environmental and ecological attributes of the study area. The baseline environment quality represents the background environmental scenario of various environmental components such as Land, Water, Air, Noise, Biological and Socio-economic status of the study area. Field monitoring studies to evaluate the base line status of the project site were carried out covering October, November, December 2022 with CPCB guidelines. Environmental data has been collected with reference to cluster quarries by EHS 360 Labs Pvt Ltd Approved by AAI, AGMARK, APEDA, BIS, EIC, FSSAI, GAFTA, IOPEPC, MOEF a TEA BOARD Notified Laboratory, for the below attributes

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### 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 (2 core & 4 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 (1 surface water & 5 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	PM10 PM2.5 SO2 NOX Fugitive Dust	24 hourly twice a week (December to February 2023)	8 (2 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	8 (2 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 Quadrant & 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: Onsite Monitoring Data/Sampling by EHS 360 Labs Pvt Ltd

The data has been collected as per the requirement of the ToR issued by SEIAA – TN and Standard ToR Published by MoEF & CC.

### 3.2 LAND ENVIRONMENT

Land use pattern of the area was studied through LISS III imagery of Bhuvan (ISRO). The 10 km radius map of study area was taken for analysis of Land use cover. The main objective of this section is to provide a baseline status of the study area covering 10 km radius around the mine site so that temporal changes due to the mining activities on the surroundings can be assessed in future

From the above table and bar diagram, it is inferred that the majority of the land in the study area is Crop and fallow land 25.61 % followed by Built-Up land 0.38%, Scrub land 4.72%. The total mining area within the study area is 17.78 ha i.e., 0.06 %. The cluster area of 8.14.0 ha contributes about 45.78 % of the total mining area within the study area. This percentage of Mining Activities shall not have any significant impact on the environment.

Developed surface drainage channels in the study area. The drainage pattern of the area is dendritic it is inferred the rock-hard rock terrain.

The area is studded with few tanks that serve as the source of drinking water and also their surplus feeds adjoining tanks. The area is mostly dry in all seasons except rainy seasons. During rainy season the surface runoff flows in NE to SW direction. The drainage pattern of the study area is given in Fig. 3.5. The quarrying activity will not hinder the natural flow of rainwater.

### 3.3 SOIL ENVIRONMENT

- ✚ The nature of soil is slightly alkaline to strongly alkaline with pH range 7.97 – 8.88
- ✚ The available Nitrogen content range between 288 – 480.4 kg/ha
- ✚ The available Phosphorus content range between 1.10 – 2.10 kg/ha
- ✚ The available Potassium range between 23.5 – 42.3 mg/kg
- ✚ Whereas, the micronutrient as zinc (Zn) and iron (Fe) were found in the range of 1.08 – 4.1 mg/kg; 1.70 – 2.03 mg/kg.

### 3.4 WATER ENVIRONMENT

#### Surface Water

The pH varied from 7.67 while turbidity found within the standards (Optimal pH range for sustainable aquatic life is 6.5 to 8.5 pH).

Total Dissolved Solids varied from 714 mg/l, the TDS mainly composed of carbonates, bicarbonates, Chlorides, phosphates and nitrates of calcium, magnesium, sodium and other organic matter.

. Chloride varied between 184.3 mg/l. Nitrates varied from 8.4 mg/l, while sulphates varied from 75.5 mg/l.

## Ground Water

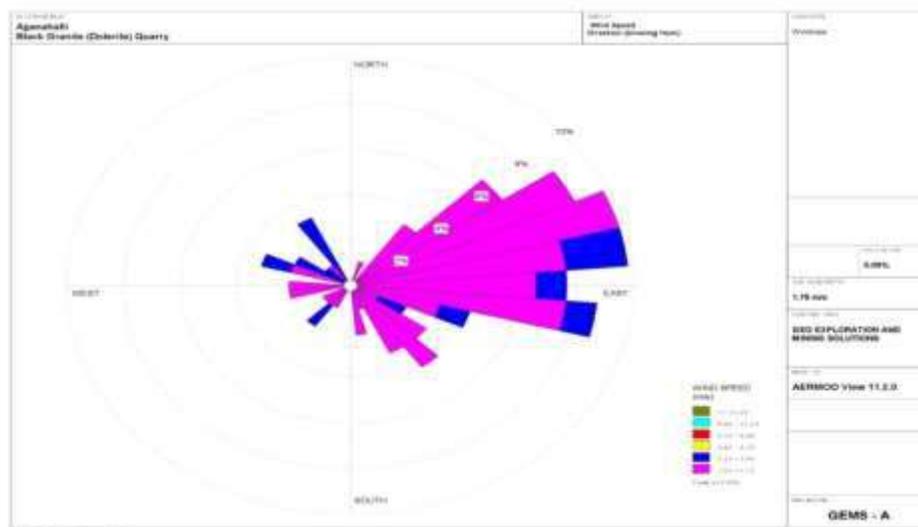
The pH of the water samples collected ranged from 6.76 – 7.61 and within the acceptable limit of 6.5 to 8.5. pH, Sulphates and Chlorides of water samples from all the sources are within the limits as per the Standard. On Turbidity, the water samples meet the requirement. The Total Dissolved Solids were found in the range of 565 - 735 mg/l in all samples. The Total hardness varied between 186.68 – 219.95 mg/l. 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 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 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 cluster forms the baseline information. The sources of air pollution in the region are mostly due to vehicular traffic, dust arising from unpaved village road and domestic & agricultural activities. The prime objective of the baseline air quality study was to establish the existing ambient air quality of the study area. These will also be useful for assessing the conformity to standards of the ambient air quality during the operation of proposed projects in cluster.

This section describes the identification of sampling locations, methodology adopted during the monitoring period and sampling frequency.

**FIGURE – 6: WIND ROSE DIAGRAM**



As per monitoring data, PM10 ranges from 53.6  $\mu\text{g}/\text{m}^3$  to 68.2/m<sup>3</sup>, PM2.5 data ranges from 25.2 $\mu\text{g}/\text{m}^3$  to 33.8  $\mu\text{g}/\text{m}^3$ , SO<sub>2</sub> ranges from 6.5  $\mu\text{g}/\text{m}^3$  to 10.3  $\mu\text{g}/\text{m}^3$  and NO<sub>2</sub> data ranges from

19.0 µg/m<sup>3</sup> to 23.7 µg/m<sup>3</sup>. 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

The main objective of noise monitoring in the study area is to establish the baseline noise level and assess the impact of the total noise expected to be generated during the project operations around the project site.

Ambient noise levels were measured at 8 (Eight) locations around the proposed project area. Noise levels recorded in core zone during day time were from 42.5 – 45.0 dB (A) Leq and during night time were from 36.8 – 37.9 dB (A) Leq. Noise levels recorded in buffer zone during day time were from 38.4 – 42.6 dB (A) Leq and during night time were from 35.2 – 37.7 dB (A) Leq..

### 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.

The result of core & Buffer zone of fauna studies shows. There is no schedule I & II Species in study area. A detail of fauna diversity of family's pattern is given in Fig No.3.27. There are no critically endangered, endangered, vulnerable and endemic species were observed. Details of faunal diversity in buffer zone are given in Table No.3.33.

### 3.8 SOCIO ECONOMIC ENVIRONMENT

- ✚ Based on the data, following inferences could be drawn:
- ✚ Total literacy rate in the study area is 61.88%.
- ✚ The study area had average educational facilities. The overall status depicts that the education is limited to primary and middle level.
- ✚ The schedule tribe community forms 2.09% and Scheduled Caste forms 12.49% of the total population of study area.
- ✚ The Other Population forms 85.43% of the total population of study area.
- ✚ The study area is well connected by Village Road.
- ✚ The study area not well health facilities of primary level.
- ✚ Considering the above facts, the proposed project will boost the socio-economic development activities in the area and hence will leave positive impact.

- ✚ The study area has mobile connectivity not well.



## **4.0 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**

The main anticipated impact on the Land Environment due to quarrying operation is change in Landscape, change in Land – use Pattern. The total area applied for quarry lease is 8.14.0 Ha, the total extent of the cluster is 8.14.0 Ha including existing and proposed quarries. No forest land involved in this lease applied area. The ultimate depth of the proposed project is 50m (30m agl + 20m bgl) below the ground level and will not intersect the ground water table. The project is site specific

#### **MITIGATION MEASURES**

- Due to the quarrying activities, the land use pattern will be altered. In order to minimize the adverse effects, the following control measures will be implemented:
- In the Opencast Method of Mining the degradation of land is insignificant, after completion of the quarrying operation the land, the land will be partially backfilled with dumped material and part of the area will be allowed to collect rainwater which will act as temporary reservoir, this Granite waste, overburden not produce any toxic effluents in the form of solid, liquid or gas.
- Top Soil will be removed and utilized for greenbelt development in the safety barrier.
- The periphery of the mining lease area will be converted to a greenbelt to prevent Noise and sound propagation to the nearby lands.
- Construction of garland drains all around the quarry pit 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.
- Barbed wire fencing will be re constructed 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 impact due to mining on the water quality is expected to be insignificant because of no use of chemicals or hazardous substances during quarrying process. For the quarrying activity water will be utilized for wire saw cutting (which will be recycled), water sprinkling on haul roads and greenbelt development. The quarrying activity will not intersect ground water table as

ultimate depth of the quarry is 50m (30m agl + 20m bgl) and water table is found at a depth of 59m BGL

## MITIGATION MEASURES

The following mitigation measures are suggested for water management

- The quarrying operation will be carried out well above the water table. There is no intersection of surface water bodies (Streams, Canal, Odai etc.,) in the proposed project area. During rainy season rain water will be collected in the quarry pit and later used for greenbelt development and for the water sprinkling in the haul roads. There is no proposal for discharging of quarry pit water outside the project area.
- There is no proposal Granite processing or workshop within the project area thus there is no effluent anticipated in the mine

## 4.3 AIR ENVIRONMENT

### ANTICIPATED IMPACT

- The air borne particulate matter generated by quarrying operation, and transportation. The emissions of Sulphur dioxide (SO<sub>2</sub>), Oxides of Nitrogen (NO<sub>x</sub>) due to excavation/loading equipment and vehicles plying on haul roads are marginal. Loading - unloading and transportation of Granite and overburden, wind erosion of the exposed area and movement of light vehicles will be the main polluting source in the mining activities releasing Particulate Matter (PM<sub>10</sub>) affecting Ambient Air of the area. Prediction of impacts on air environment has been carried out taking into consideration proposed production of 55,500 cbm (ROM) on air environment and net increase in emissions by Open pit source modelling in AERMOD Software..

## MITIGATION MEASURES

### . Advantages of Wet

**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 –**

- Blasting will be carried out only to remove the overburden and weathered portion
- Establish time of blasting to suit the local conditions and water sprinkling on blasting face
- Controlled blasting include 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

**Haul Road & Transportation –**

- Water will be sprinkled on haul roads, Loading Points 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.
- 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 road 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 area.

**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 month once to assess effectiveness of mitigation measures proposed.

#### **4.4 NOISE ENVIRONMENT ANTICIPATED IMPACT**

Attenuation due to Green Belt has been taken to be 4.9 dB (A). The inputs required for the model are:

- Source data
- Receptor data
- Attenuation factor

Source data has been computed considering of all the machinery and activities used in the mining process. Same has been listed in Table 4-10.

The total noise to be produced by mining activity is calculated to be 95.8 dB (A). Generally, most mining operations produce noise between 100-109 dB (A). We have considered equipment and operation noise levels (max) to be approx. 109 dB (A) for noise prediction modelling.

#### **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 are utilized for breaking boulders;
- Controlled blasting with proper spacing, burden, stemming and optimum charge/delay will reduce noise;
- 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 will be developed around the project areas 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

- None of the plants will be cut during operational phase of the mine.
- There shall be negligible air emissions or effluents from the project site. During loading the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly.

Most of the land in the buffer area is undulating terrain with crop lands, grass patches and small shrubs. Hence, there will be no effect on flora of the region

### MITIGATION MEASURES

The project site has a land to develop greenbelt within the lease area, along roads and other vacant areas. The main objective of the green belt is 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 services. To avoid dust emissions, the mined materials will be covered with tarpaulin during transportation.

- Plants that grow fast will be preferred.
- Preference for high canopy covers plants with local varieties.
- Perennial and evergreen plants will be preferred.
- The development of Green Belt is an important aspect for any plant because:
  - It helps in noise abatement for the surrounding area.
  - It maintains the ecological balance.
  - It increases the aesthetic value of site.

### GREENBELT DEVELOPMENT PLAN

<b>P1 - Tvl. Tamilkumaran Productions Private Limited</b>					
<i>Year</i>	<i>No.of trees proposed to be</i>	<i>Survival %</i>	<i>Area to be covered sq.m</i>	<i>Name of the species</i>	<i>No. of trees expected to be</i>
I	300	80%	2700	Neem, Pongamia Pinnata, Mango Casuarina etc.,	240
II	300	80%	2700		240
III	300	80%	2700		240
IV	300	80%	2700		240
V	300	80%	2700		240
<b>P2 - M/s. PVI Trading Corporation</b>					
<i>Year</i>	<i>No.of trees proposed to be</i>	<i>Survival %</i>	<i>Area to be covered sq.m</i>	<i>Name of the species</i>	<i>No. of trees expected to be</i>
I	500	80%	4500	Neem, Pongamia Pinnata, Mango Casuarina etc.,	400
II	500	80%	4500		400
III	500	80%	4500		400
IV	500	80%	4500		400
V	500	80%	4500		400

**TABLE NO: 4.11. PREPARATION OF GREEN BELT DETAILS**

<b>P1 - Tvl. Tamilkumaran Productions Private Limited</b>									
<i>S.No</i>	<i>Details of work</i>	<i>Year wise details plantation for each area</i>						<i>Total No. Plants (5years)</i>	<i>Total Cost (Rs.)</i>
		<i>1<sup>st</sup> year</i>	<i>2<sup>nd</sup> year</i>	<i>3<sup>rd</sup> years</i>	<i>4<sup>th</sup> years</i>	<i>5<sup>th</sup> years</i>			
1	Sapling of plant (Approximately cost @ INR 100 per sapling/ plant).	300	300	300	300	300	1500	<b>1,50,000</b>	
2	Maintenance (Rs.) (Manuring, Fertilizer, Insecticide application, watchman etc.,)	Cost (Rs. 10000/-) per year for five-year period						<b>50,000</b>	
<b>Total Rupees Two lakhs only</b>								<b>2,00,000</b>	
<b>P2 - M/s. PVI Trading Corporation</b>									
<i>S.No</i>	<i>Details of work</i>	<i>Year wise details plantation for each area</i>						<i>Total No. Plants (5years)</i>	<i>Total Cost (Rs.)</i>
		<i>1<sup>st</sup> year</i>	<i>2<sup>nd</sup> year</i>	<i>3<sup>rd</sup> years</i>	<i>4<sup>th</sup> years</i>	<i>5<sup>th</sup> years</i>			
1	Sapling of plant (Approximately cost @ INR 100 per sapling/ plant).	500	500	500	500	500	2500	<b>2,50,000</b>	
2	Maintenance (Rs.) (Manuring, Fertilizer, Insecticide application, watchman etc.,)	Cost (Rs. 10000/-) per year for five-year period						<b>50,000</b>	
<b>Total Rupees Three lakhs only</b>								<b>3,00,000</b>	

## 4.6 SOCIO ECONOMIC ENVIRONMENT

### ANTICIPATED IMPACT

From the primary Socio-economic survey & through secondary data available from established literature and census data 2011, it is found that there would be positive impact on Socio-economic condition of the nearby area. There is no habitation within 300 m of the proposed mining lease area. Therefore, no major impact is anticipated on the nearby habitation during the entire life of the mine.

### 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.
- 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, duties, etc., from this project directly and indirectly.
- From above details, the quarry operations will have highly beneficial positive impact in the area

## **5.0 ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)**

The quarrying operation like drilling, blasting, excavation, loading & transportation are being carried out. The site has been selected based on geological investigation and exploration as below:

- Transportation facility for materials & manpower
- Overall impact on environment and mitigation feasibility
- Socio – economic background.

Enough infrastructure exists and lesser resources are required to be deployed. Since, any further construction for infrastructure is not required and hence does not affect the environment considerably. The mineral deposits are site specific in nature; hence question of seeking alternate site does not arise for this project.

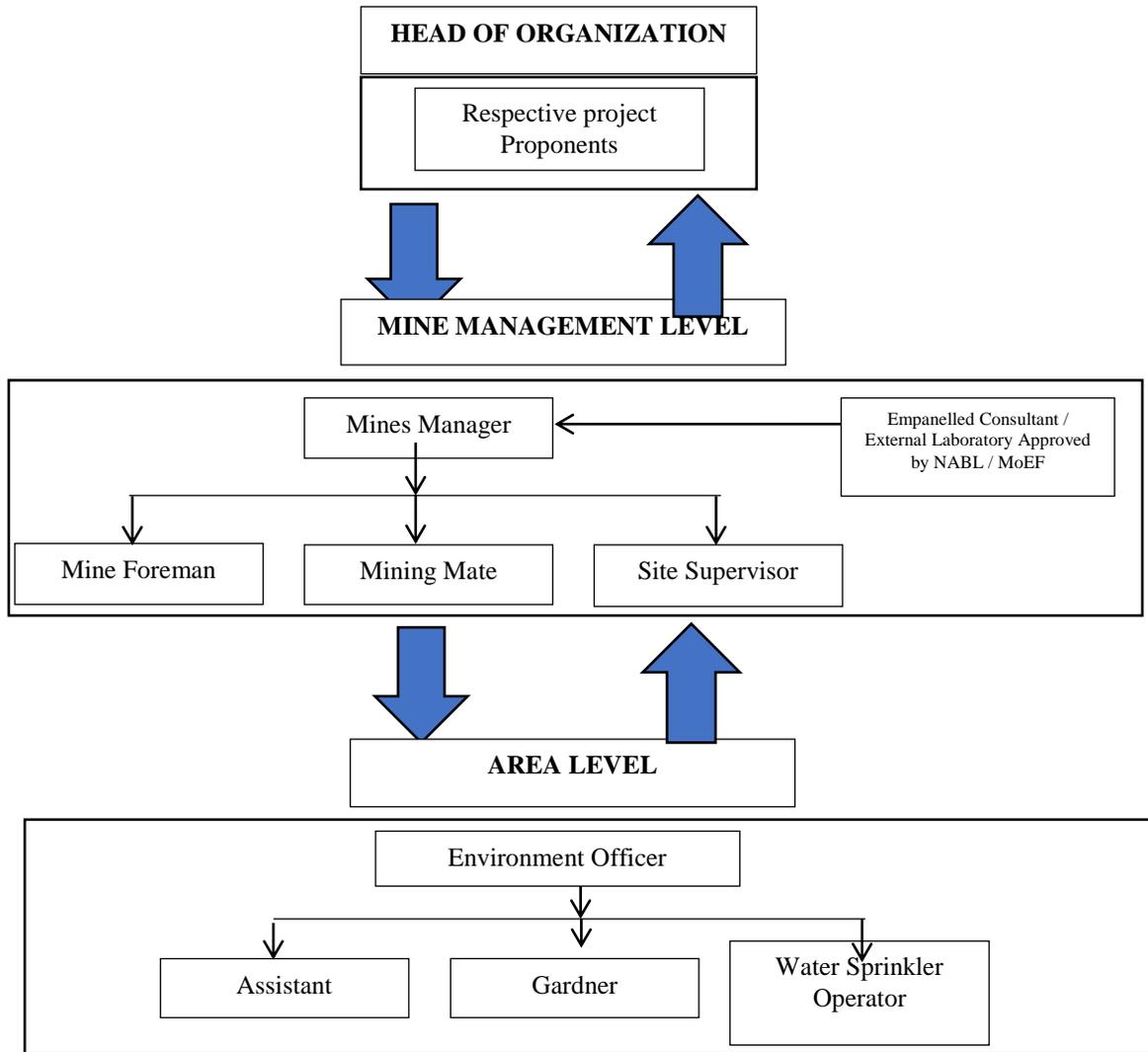
## **6.0 ENVIRONMENT MONITORING PROGRAM**

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

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 <sub>2.5</sub> , PM <sub>10</sub> , SO <sub>2</sub> and NO <sub>x</sub> .
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

## 7.0 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 31<sup>st</sup> 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 MULTI COLOUR GRANITE

Quarry	Mineable Reserves ROM In m <sup>3</sup>	Mineable Reserves of Granite	Proposed production for five-year period	Production of ROM Per Day	Production of Granite Per day in m <sup>3</sup>	Number of Lorry loads per Week
P1	73,845	7,385	18,375	12	1	1
P2	1,48,525	14,853	37,125	25	2	2
<b>Total</b>	<b>2,22,370</b>	<b>22,238</b>	<b>55,500</b>	<b>37</b>	<b>3</b>	<b>3</b>

#### PREDICTED NOISE INCREMENTAL VALUES IN 500 M RADIUS QUARRIES

Emission Estimation for quarry P1				
Estimated Emission Rate for PM <sub>10</sub>	Activity	Source type	Value	Unit
	Drilling	Point Source	0.042810432	g/s
	Blasting	Point Source	0.000026071	g/s
	Mineral Loading	Point Source	0.041165276	g/s
	Haul Road	Line Source	0.002631934	g/s
	Overall Mine	Area Source	0.107858486	g/s
Estimated Emission rate for SO <sub>2</sub>	Overall Mine	Area Source	0.000214448	g/s
Estimated Emission rate for NO <sub>x</sub>	Overall Mine	Area Source	0.000017563	g/s
Emission Estimation for quarry P2				
Estimated Emission Rate for PM <sub>10</sub>	Activity	Source type	Value	Unit
	Drilling	Point Source	0.050070831	g/s
	Blasting	Point Source	0.000057060	g/s
	Mineral Loading	Point Source	0.041929128	g/s
	Haul Road	Line Source	0.002632427	g/s
	Overall Mine	Area Source	0.130160008	g/s
Estimated Emission rate for SO <sub>2</sub>	Overall Mine	Area Source	0.000277123	g/s
Estimated Emission rate for NO <sub>x</sub>	Overall Mine	Area Source	0.000034539	g/s

#### SOCIO ECONOMIC BENEFITS FROM 2 MINES

Location code	Employment	Project Cost	CER
P1	25	7,72,01,000	5,00,000
P2	27	6,09,70,000	5,00,000
<b>Total</b>	<b>52</b>	<b>13,81,71,000</b>	<b>10,00,000</b>

## 8.0 PROJECT BENEFITS

Black Granite Quarry of Ajjanahalli Black Granite Quarries 5,550m<sup>3</sup> of Granite @ 10% recovery (ROM 55,500m<sup>3</sup> for the entire period- Life of the mine) for Life of Mine of 20 Years. 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
- ✦ To meet out the demand supply gap of Granite and enhance the foreign exports

## 9.0 ENVIRONMENT MANAGEMENT PLAN

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.

## 10.0 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