

# EXECUTIVE SUMMARY

## **M/s,Sri Bhagavathi Amman Blue Metals, ROUGH STONE AND GRAVEL QUARRY**

S.F. Nos: 216/2B(P),217/1,217/2,217/3A,217/3B - Extent: 4.94.0 ha

Gudalur Melpagam Village, Aravakurichi Taluk, Karur District,  
Tamil Nadu State

**“B1” CATEGORY – MINOR MINERAL – CLUSTER – NON FOREST  
LAND**

**\* CLUSTER EXTENT =7.23.0 HA**

**Complied as per ToR Obtained vide**

**Lr.No.SEIAA-TN/F.No.7676/SEAC/TOR-768/2020 Dated: 06.10.2020**

**Project Proponent**

**M/s, Sri Bhagavathi Amman Blue Metals,**  
Kovilpalyam,Gudalur Melpakkam Village  
Aravakurichi Taulk, Karur District,  
Tamil Nadu State

**Environmental Consultant**



**GEO EXPLORATION AND MINING SOLUTIONS**

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

## 1. INTRODUCTION

Rough stone is the major requirements for construction industries. This EIA report is prepared for M/s. Sri Bhagavathi Amman Blue Metals, the proponent is a Partnership firm Thiru. K. Natrayan & Tmt. N. Kavitha is the partners of the firm Thiru. K. Natrayan is the Managing partner.

The proponent applied for Rough stone and Gravel quarry lease in an extent of 4.94.0 Ha, Patta Land located in S.F.No 126/2B( P), 217/1, 217/2, 217/3A & 217/3B of Gudalur Melpagam Village, Aravakurichi Taluk, Karur District, Tamil Nadu State.

The proponent has obtained necessary statutory clearances from the Department of Geology and Mining, Karur District, Tamil Nadu (Statutory Clearance Documents are enclosed along with Mining plan as Annexure No III). The total Extent of the quarries within the radius of 500m from this proposal is exceed 5Ha, hence it is considered “B1” Category project as per the EIA notification, 2006 (Including its amendments from time to time).

Proponent applied for Environmental Clearance to SEIAA, Tamil Nadu and obtained ToR vide letter No.SEIAA-TN/F.No.7222/SEAC/TOR-718/2020 Dated: 23/06/2020 to carrying out EIA and EMP studies for the Rough stone and Gravel quarry Metals and the Baseline Monitoring study has been carried out during the period of October – December 2020

This EIA report is prepared by considering Cumulative impact in the proposed and Existing Rough stone quarry which is falling in the cluster situation (One Proposed and one existing quarry) total extent of Cluster quarries 7.23.0 ha the cluster area calculated as per MoEF & CC Notification S.O. 2269(E) Dated 1<sup>st</sup> July 2016.

Now, as per Order Dated: 04.09.2018 & 13.09.2018 passed by Hon'ble National Green Tribunal, New Delhi in O.A. No. 173 of 2018 & O.A. No, 186 of 2016 and MoEF & CC Office Memorandum F. No. L-11011/175/2018-IA-II (M) Dated: 12.12.2018 clarified the requirement for EIA, EMP and therefore, Public Consultation for all areas from 5 to 25 ha falling in Category B- 1 and appraised by SEAC/ SEIAA as well as for cluster situation.

The proposed projects is categorized under category “B1” Activity 1(a) (mining lease area in cluster situation) and will be considered at SEIAA – TN after conducting Public Hearing and Submission of EIA/EMP Report for Grant of Environmental Clearance.

**“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 : M/s.Sri Bhagavathi Amman Blue Metals,  
Thiru.K.Natrayan,(Managing Partner)

Address : Kovilpalayam,Gudalur Melpakkam Village,  
Aravakurichi Taulk,  
Karur District,

State : Tamil Nadu

Pin code : 639111

Mobile No : +91 9786700232, 9600247273

M/s. Sri Bhagavathi Amman Blue metals is partnership firm Thiru. K.Natrayan and Tmt N. Kavitha is partners of this firm. Thiru K. Natrayan is the Managingpartner and authorized signatory

**1.2 QUARRY DETAILS WITHIN 500 M RADIUS**

<b>CLUSTER QUARRIES</b>				
<b>CODE</b>	<b>Name of the Quarry</b>	<b>S.F.Nos &amp; Village</b>	<b>Extent</b>	<b>Status</b>
P1	M/s,Sri Bhagavathi Amman Blue Metals, Rough Stone and Gravel Quarry	216/2B(P),217/1,217/2, 217/3A,217/3B	4.94.0 ha	Obtained TOR Lr.No.SEIAA- TN/F.No.7676/SEA C/TOR-768/2020 Dated 06.10.2020
<b>CODE</b>	<b>Name of the Quarry</b>	<b>S.F. Nos &amp; Village</b>	<b>Extent</b>	<b>Status</b>
E1	Thiru.Natrayan, Rough Stone and Gravel Quarry	215/ 2A & 215/ 2B	2.29.0 ha	Lease period 06.05.2015 to 05.05.2020 After lease expired the quarry Not operated.
<b>TOTAL CLUSTER EXTENT</b>			<b>7.23.0 Ha</b>	

**TABLE 1.3 SALIENT FEATURES OF THE PROPOSAL – P1**

<b>SALIENT FEATURES OF PROPOSAL “P1”</b>	
Name of the Mine	Rough stone quarry and Gravel quarry belongs to M/s. Sri Bhagavathi Amman Blue Metals
Survey Nos	216/2B(P),217/1,217/2, 217/3A,217/3B
Land Type	Patta Land
Extent	4.94.0 Ha
Mining Plan Period / Lease Period	5 years

Existing pit dimension	Pit I	133m(L) x 53m (W) x 34m (D)
	Pit II	132 m(L) x 75m (W) x 18m (D)
Ultimate Pit Dimension	288m(L) x 208m(W) x 42m(D)	
Proposed Depth of Mining	47m BGL	
Depth restricted during the appraisal SEAC meeting	42m BGL	
Latitude between	10°54'10.87" N to 10°54'21.77" N	
Longitude between	77°48'05.32" E to 77°48'13.84" E	
Toposheet No	58 – F/13	
Highest Elevation	202m AMSL	
Water level	58 – 63m BGL	
Machinery Proposed	Jack Hammer	10
	Compressor	3
	Excavator with rock breaker attachment/Bucket	2
	Tippers	4
Proposed Blasting Method	Controlled Blasting Usage of Slurry Explosive with MSD detonators	
Manpower Proposed	39	
Total Cost	Project Cost	Rs 1,03,31,500/-
	EMP Cost	Rs 3, 80,000/-
	Total	Rs. 1,07,11,500/-

#### 1.4 STATUTORY DETAILS

- The project proponent had applied for Rough Stone and Gravel quarry lease over an extent of 4.94.0 ha of Patta Land in SF.Nos - 216/2B(P),217/1,217/2, 217/3A, 217/3B Gudalur Melpagam Village, Aravakurichi Taluk and Karur District. Tamil Nadu State – Dated: 18.03.2019.
- The application was processed and has been recommended for quarrying lease with precise area communication vides Rc.No.220/Mines/2019,Dated:08.01.2020 (Enclosed with Mining plan) issued by the District Collector, Coimbatore for preparation of Mining Plan and Obtaining Prior Environmental Clearance from SEIAA, TN.
- Mining plan got approved by the Director of Geology and Mining,Karurvide Rc.No.220/Mines/2019, dated 02.03.2020
- The proposed project falls under “B1” Category as per Order Dated: 04.09.2018 & 13.09.2018 passed by Hon'ble National Green Tribunal, New Delhi in O.A. No. 173 of 2018 & O.A. No, 186 of 2016 and MoEF & CC Office Memorandum F. No. L-11011/175/2018-IA-II (M) Dated: 12.12.2018.

- Therefore, the project proponent submitted their online application for ToR for EC on 16.03.2020 vide online proposal number – SIA/TN/MIN/52438/2019, Dated 16.03.2020.
- The proposal was placed in 169<sup>th</sup> SEAC meeting held on 07.08.2020 and the committee recommended for issue of ToR.
- The proposal was considered in 399<sup>th</sup> SEIAA meeting held on 24.09.2020 and issued ToR vide Letter No SEIAA-TN/F.No.7676/SEAC/ToR-768/2020 Dated 06.10.2020

## 2. PROJECT DESCRIPTION

The proponent applied for Quarry lease dated 18.03.2019. The precise area communication letter issued by District Collector, vide Lr. No. 220/Kanimam/2019, Dated 08.01.2020, the mining plan has been prepared and got approved by the Deputy Director, Rc.No. 220/Kanimam/2019, Dated 02.03.2020

Previously the same area has been granted for quarry lease to M/s. Sri Bhagavathi Amman Blue Metals vide proceeding of the District collector, Karur in Rc No. 102/G&M/2010 Dated:25.08.2010 (03.09.2010 to 02.09.2015). During this lease period the lessee excavated two pits in the project area the details of the existing pit dimension is

- Pit I - 133m(L) x 153m (W) x 34m (D),  
Pit II - 132m(L) x 75m (W) x 18m (D),

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.

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

### 1.2 SITE CONNECTIVITY TO THE PROJECT AREA

<b>Nearest Roadway</b>	(NH – 67 – Trichy – Coimbatore – 4.5 km – NW) (SH -21- Pollachi – Karur – 7.5 Km – SE)
<b>Nearest Village</b>	Kodanthur – 2km - NE
<b>Nearest Town</b>	Chinadharapuram - 7.5Km - SE
<b>Nearest Railway Station &amp; Railway Line</b>	Kodumudi Railway Station -21km – North East & Karur – Erode Railway Line – 21km – North East
<b>Nearest Airport</b>	Coimbatore Airport – 84 km NW
<b>Seaport</b>	Kochi 200 km South West

## 2.2 LAND USE PATTERN OF THE LEASE APPLIED AREA

DESCRIPTION	Area to be required during the present plan period (ha)	Area at the end of life of quarry (ha)
Area under quarry	2.72.4	4.24.5
Infrastructure	Nil	0.02.0
Roads	0.02.0	0.05.0
Green Belt	Nil	0.23.6
Un utilized area	2.19.5	0.39.5
<b>TOTAL</b>	<b>4.94.0</b>	<b>4.94.0</b>

## 2.3 OPERATIONAL DETAILS OF LEASE APPLIED AREA

Description	Rough stone in m <sup>3</sup>	Gravel formation in m <sup>3</sup>
Geological Resources	22,13,235	98,366
Mineable Reserves	640128	12,516
Reserves estimated after restrict the depth upto 42m BGL	5,38,638	12,516
Year wise Production	5,38,638	12,516

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

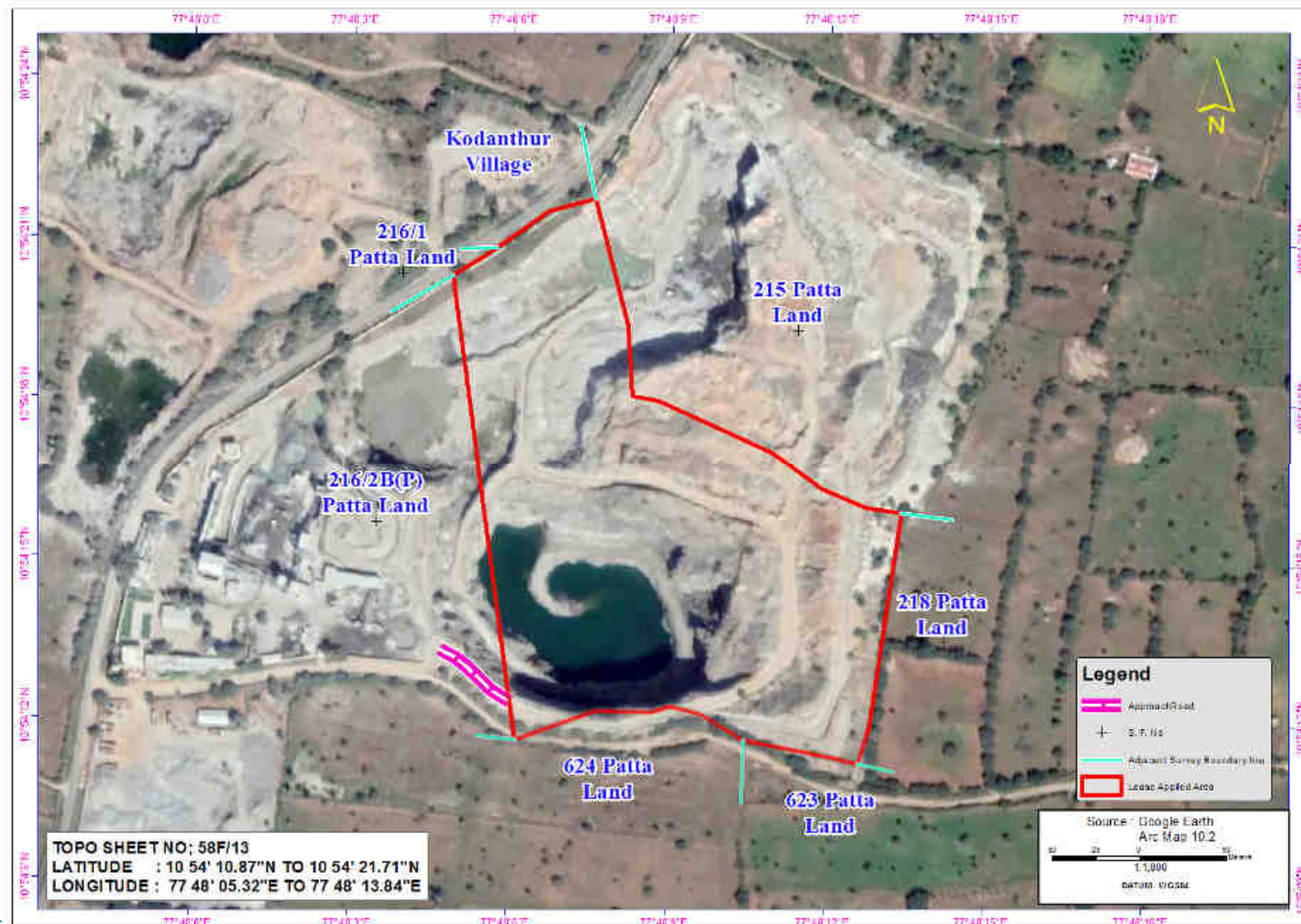
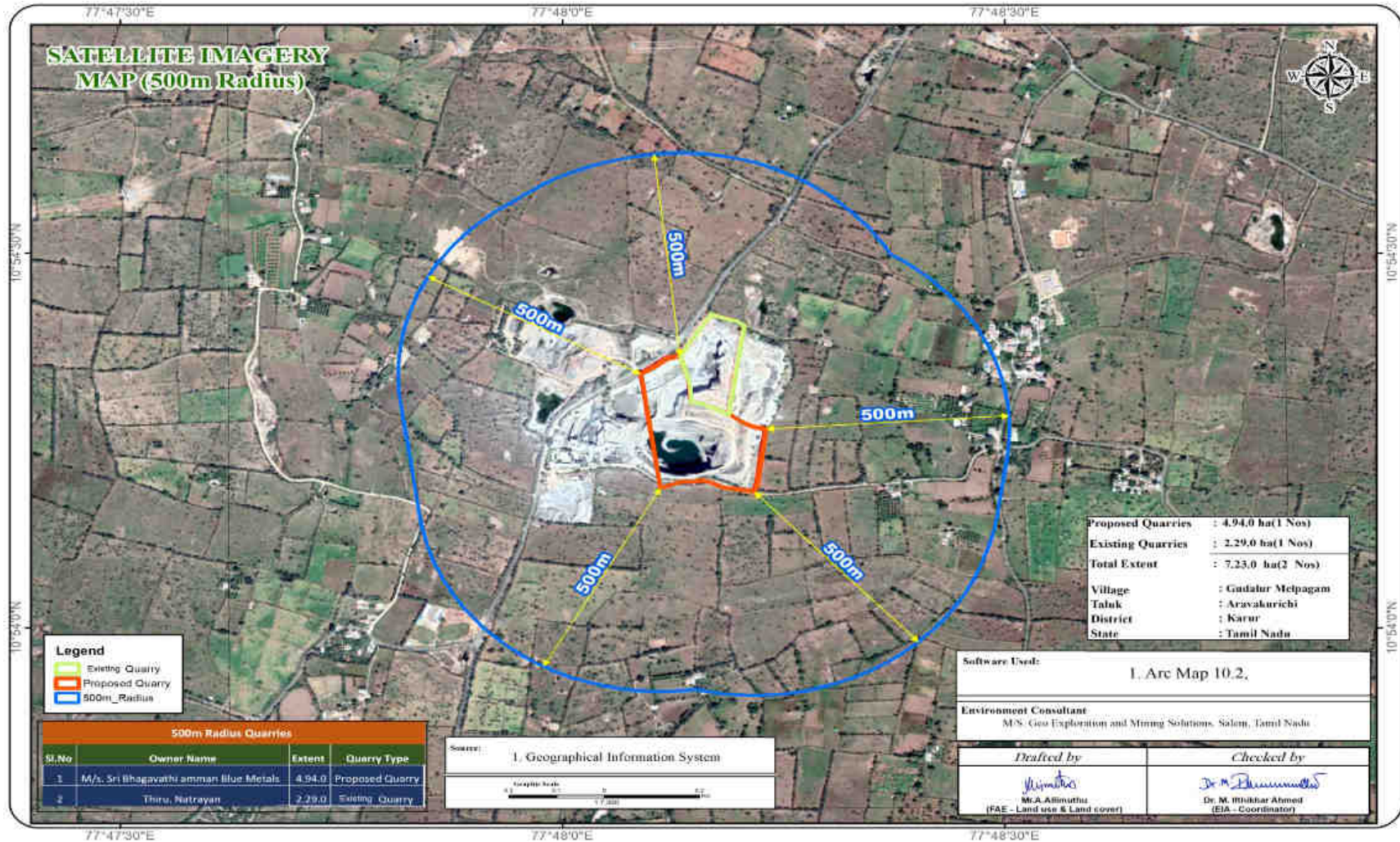
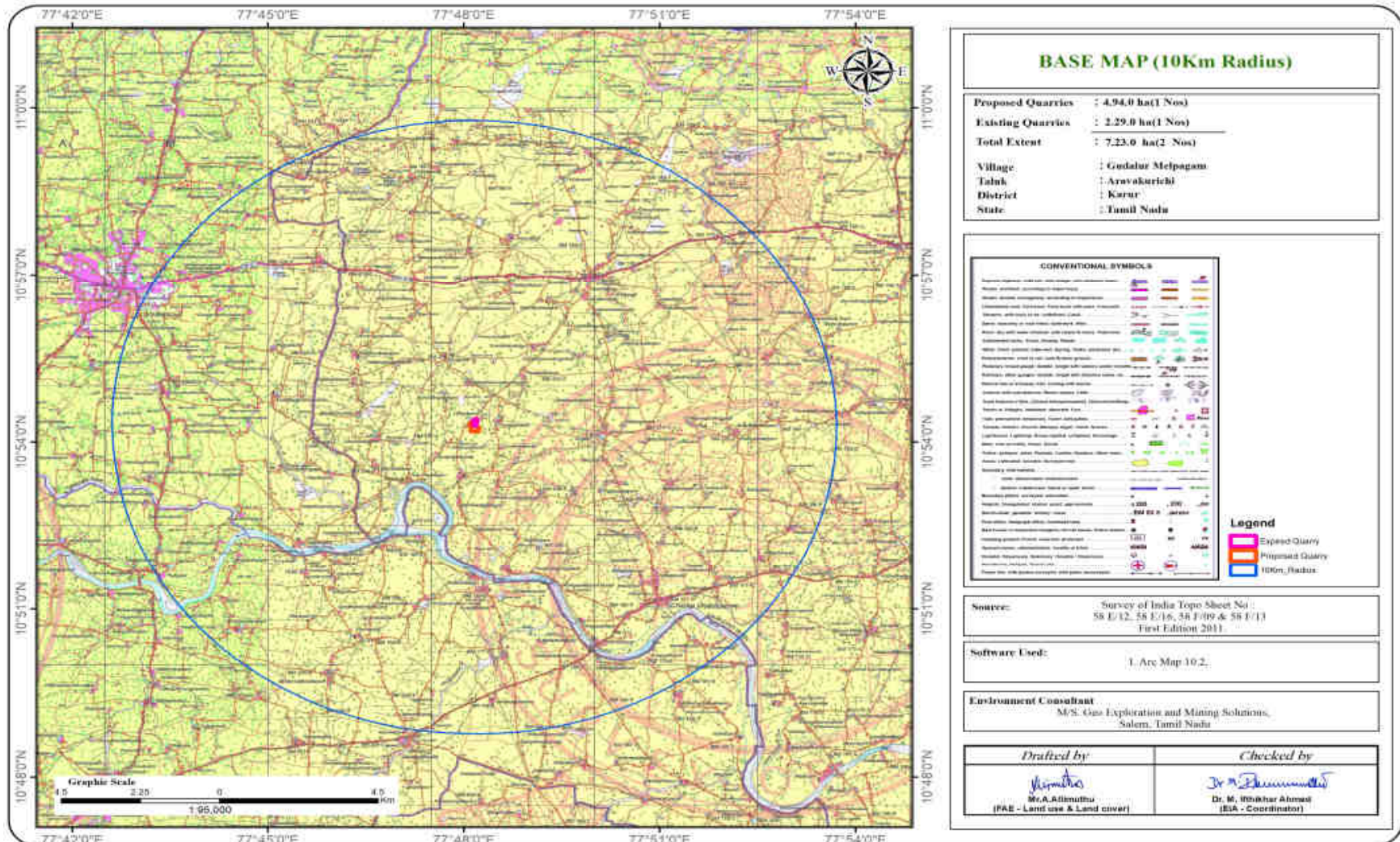


FIGURE – 2: GOOGLE IMAGE SHOWING CLUSTER (500 m QUARRIES)

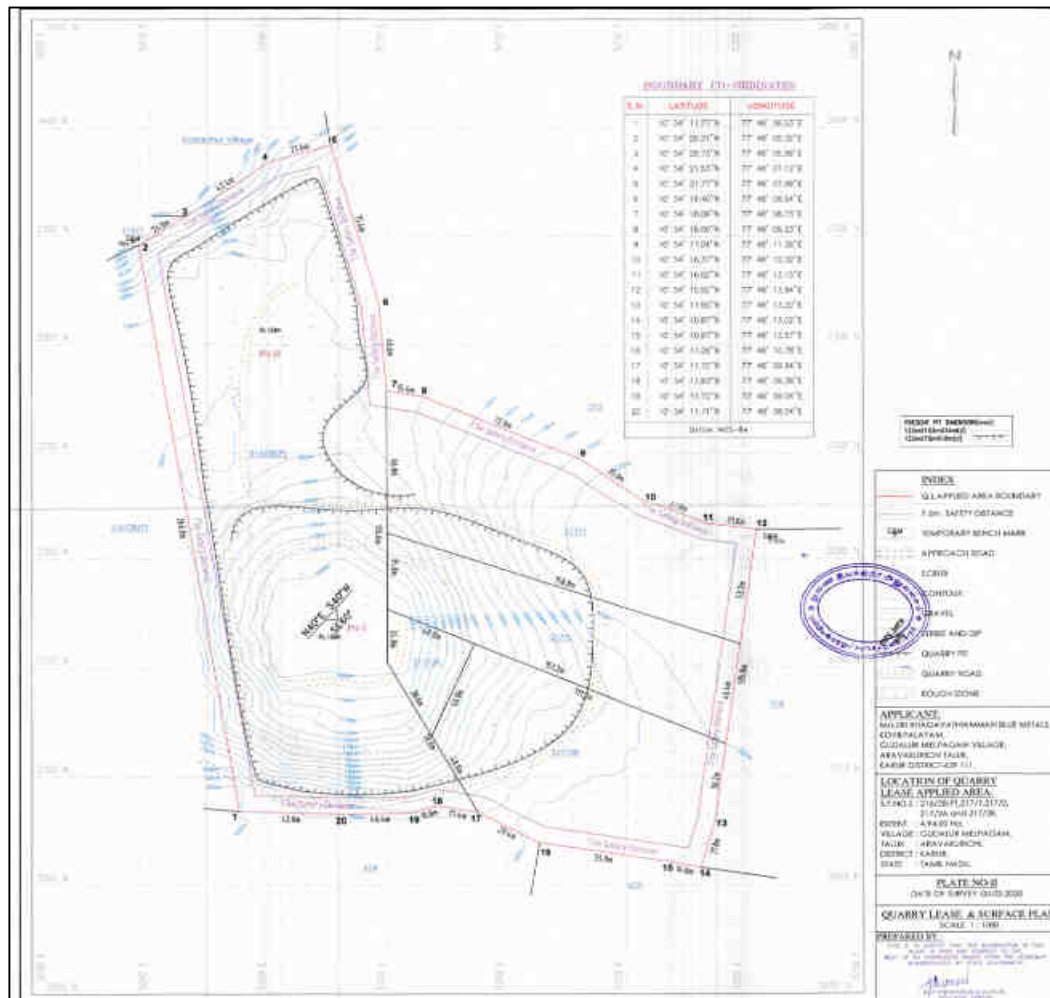




**FIGURE – 3: TOPOSHEET MAP COVERING 10 KM RADIUS**



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



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



## 2.4 METHOD OF MINING

- Opencast Mechanized Mining Method will be adopted
- Maximum height & width of the bench is 5m will be maintained since the Rough stone formation is hard in nature
- As far as the quarrying of Rough Stone is concerned, observance of the provisions of Regulation 106 (2) (b) as above is seldom possible due to various inherent petro genetic factors coupled with mining difficulties. Hence it is proposed to obtain relaxation to the provisions of the above regulation from the Director of Mines Safety for which necessary provision is available with the Regulation 106 (2) (b) of MMR-1961, under Mine Act – 1952.
- The top layer of overburden (Gravel) will be Excavated and directly loaded into the tippers for the filling and levelling of low-lying areas
- The Rough Stone is a batholith formation and the splitting of rock mass of considerable volume from the parent rock mass will be carried out by deploying jackhammer drilling and Slurry Explosives will be used for blasting.

Hydraulic Excavators attached with Rock Breakers unit will be deployed for breaking large boulders to required fragmented sizes to avoid secondary blasting and hydraulic excavators attached with bucket unit will be deployed for loading the Rough Stone into the tippers and then the stone is transported from pithead to the nearby crushers

## 2.5 PROPOSED MACHINERY DEPLOYMENT

S.NO.	TYPE	NOS	SIZE/CAPACITY	MOTIVE POWER
1	Jack hammer	10	1.2 to 2.0m	Compressed air
2	Compressor	3	50 HP	Diesel Drive
3	Excavator with Bucket / Rock Breaker Unit	2	150 – 200 HP	Diesel Drive
4	Tipper/ Dumpers	4	20 Tonnes	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

Pit	Length (Max) (m)	Width (Max) (m)	Depth (Max) (m)
I	288	208	42

### 3.0 DESCRIPTION OF THE ENVIRONMENT

Field monitoring studies to evaluate the base line status of the project site were carried out covering October 2020, November 2020 & December 2020 as per CPCB guidelines. Environmental Monitoring data has been collected with reference to proposed mine by OMEGAA LABORATORIES ISO 9001: 2008, OHSAS 18001: 2007 Certified & MoEF Notified Laboratory

#### 3.1 ENVIRONMENT MONITORING ATTRIBUTES

Sl.No.	Attributes	Parameters	Source and Frequency
1	Ambient Air Quality	PM10, PM 2.5, SO2, NO2	Continuous 24 hourly samples twice a week for three months at 8 locations (2Core & 6 Buffer)
2	Meteorology	Wind speed and direction, temperature, relative humidity and rainfall	Near project site continuous for three months with hourly recording and from secondary sources of IMD station
3	Water quality	Physical, Chemical and Bacteriological parameters	Grab samples were collected at 5 ground water and 1 surface water locations once during study period.
4	Ecology	Existing terrestrial and aquatic flora and fauna within 10 km radius circle.	Limited primary survey and secondary data was
5	Noise levels	Noise levels in dB(A)	8locations (3Core & 5 Buffer) – data monitored once for 24 hours during EIA study
6	Soil Characteristics	Physical and Chemical Parameters	Once at 6 locations (1 Core & 5 Buffer) during study period
7	Land use	Existing land use for different categories	Based on Survey of India topographical sheet and satellite imagery and primary survey.
8	Socio-Economic Aspects	Socio-economic and demographic characteristics, worker characteristics	Based on primary survey and secondary sources data like census of India 2011.
9	Hydrology	Drainage pattern of the area, nature of streams, aquifer characteristics, recharge and discharge areas	Based on data collected from secondary sources as well as hydro-geology study report prepared.
10	Risk assessment and Disaster Management Plan	Identify areas where disaster can occur by fires and explosions and release of toxic substances	Based on the findings of Risk analysis done for the risk associated with mining.

#### 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.

The majority of the land in the study area is Agriculture Land (Crop Land + Agriculture Plantation) 85.2% followed by Builtup rural Land 7.82%.

The total mining area within the study area is 345.98 ha i.e., 1.07 %. The cluster area of 7.23.0 ha contributes about 2.08 % of the total mining area within the study area. This percentage of Mining Activities shall not have any significant impact on the environment.

The project area exhibits almost plain topography, the gentle sloping towards South East side and the altitude of the area is 202m AMSL

There is no Wildlife Sanctuaries, National Park and Archaeological monuments within project area. Therefore, there will be no need to acquisition/diversion of forest land.

### 3.3 SOIL ENVIRONMENT

- ✚ Variation in pH of the soil in the study area was found to be moderately alkaline to strongly alkaline in nature (7.88.-8.47).
- ✚ Mostly the soils collected from different location in the study area are Sandy loam & bulk density of the soil in range between 1.05 to 1.53 g/cc.
- ✚ The available Nitrogen content range between 32.7 to 58.4 kg/ha
- ✚ The available Phosphorus content range between 38.1 to 54.9 kg/ha
- ✚ The available Potassium range between 5.3 to 8.7 mg/kg

### 3.4 WATER ENVIRONMENT

Major water bodies in the study area is Amaravathi River is located 2.35Km South-West from the proposed project area The study area is studded with few tanks that serve as the source of drinking water and also their surplus feeds adjoining tanks. The rainfall over the area is moderate, the rainwater storage in open wells and trenches are in practice over the area and the stored water acts as source of freshwater for couple of months after rainy season.

#### Surface Water

##### Ph:

The pH is 7.62 while turbidity found within the standards (Optimal pH range for sustainable aquatic life is 6.5 to 8.5 pH).

##### Total Dissolved Solids:

Total Dissolved Solids varied from 457 mg/l, the TDS mainly composed of carbonates, bicarbonates, Chlorides, phosphates and nitrates of calcium, magnesium, sodium and other organic matter.

##### Other parameters:

Chloride is 152 mg/l. Nitrates - 7.3 mg/l, while sulphates - 29.6 mg/l.

#### Ground Water

The pH of the water samples collected ranged from 7.05 to 7.49 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

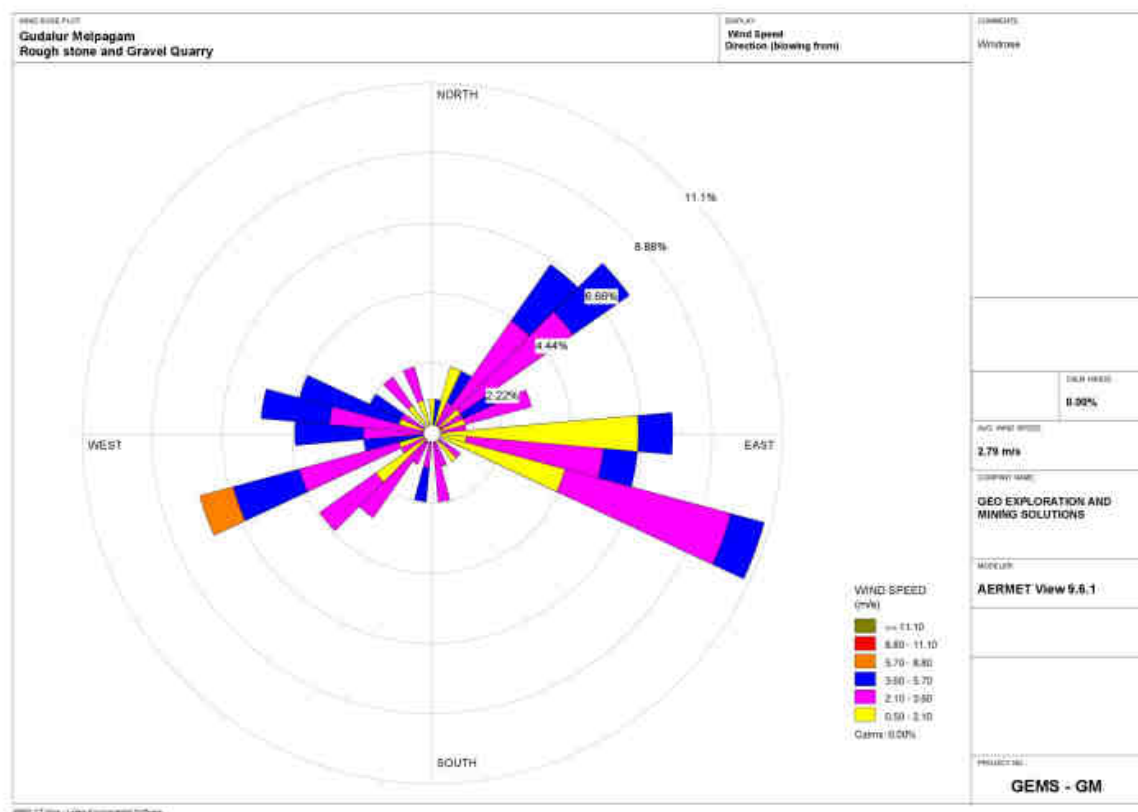
requirement. The Total Dissolved Solids were found in the range of 343 - 466 mg/l in all samples. The Total hardness varied between 109.9 to 166.52 mg/l for all samples.

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

### 3.5 AIR ENVIRONMENT

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

**FIGURE – 6: WIND ROSE DIAGRAM**



### 3.6 SUMMARY OF AMBIENT AIR QUALITY

The results of ambient air quality monitoring for the period (October to December 2020) are presented in the report. Data has been compiled for three months.

As per monitoring data, PM<sub>10</sub> ranges from 34.0 µg/m<sup>3</sup> to 48.3 µg/m<sup>3</sup>, PM<sub>2.5</sub> data ranges from 17.8 µg/m<sup>3</sup> to 27.9 µg/m<sup>3</sup>, SO<sub>2</sub> ranges from 4.2 µg/m<sup>3</sup> to 16.8 µg/m<sup>3</sup> and NO<sub>2</sub> data ranges from 10.2 µg/m<sup>3</sup> to 18.9 µg/m<sup>3</sup>. The concentration levels of the above criteria pollutants were observed to be well within the limits of NAAQ standard prescribed by CPCB.

### **3.7 NOISE ENVIRONMENT**

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 47.5 – 49.6 dB (A) Leq and during night time were from 38.7 – 39.4 dB (A) Leq. Noise levels recorded in buffer zone during day time were from 48.1 – 48.9 dB (A) Leq and during night time were from 38.4 – 39.7 dB (A) Leq.

The values of noise observed in some of the areas are primarily owing to quarrying activities due to cluster of quarries within 500m radius, movement of vehicles and other anthropogenic activities. Noise monitoring results reveal that the minimum & Maximum noise levels at day time were recorded in the range of 47.5 dB(A) and 49.6dB(A) in Project area 38.4 dB(A) in Chinthlavadi village & 39.4 dB(A) in Project Area at night time. Thus, the noise level for Industrial and Residential area meets the requirements of CPCB.

### **3.8 ECOLOGICAL ENVIRONMENT**

There is no Forest land, National Parks, Eco sensitive areas, Wild life sanctuaries within the radius of 10 km. An ecological survey of the study area was conducted particularly with reference to the listing of species and assessment of the existing baseline ecological (terrestrial) condition in the study area.

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

### **3.9 SOCIO ECONOMIC ENVIRONMENT**

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

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

The proposed project will aim to provide preferential 39 persons to the local people there by improving the indirect employment opportunity in the area were around 70 persons in turn the social standards will improve.

#### **4. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

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

##### **4.1 LAND ENVIRONMENT:**

###### **ANTICIPATED IMPACT**

The main anticipated impact on the Land Environment due to quarrying operation is change in Landscape, change in Land – use Pattern. The total extent of the cluster quarries is 7.23.0 ha including existing and proposed quarries in patta land. The ultimate depth of the quarrying is 42m Maximum below the ground level and will not intersect the ground water table. The project is site specific

###### **MITIGATION MEASURES**

Due to the quarrying activities in the project the land use pattern will be altered. In order to minimize the adverse effects, the following control measures will be implemented:

- In the Rough stone and Gravel quarrying operation the degradation of land is insignificant, after completion of the quarrying operation the land will be allowed to collect rain water which will act as temporary reservoir, this rough stone does not produce any toxic effluents in the form of solid, liquid or gas
- 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 carried out at the conceptual stage, Security will be posted round the clock, to prevent inherent entry of the public and cattle.

##### **4.2 WATER ENVIRONMENT**

###### **ANTICIPATED IMPACT ON SURFACE AND GROUND WATER**

The impact due to quarrying on the water quality is expected to be insignificant because of no use of chemicals or hazardous substances during quarrying process. The proposed depth of this project is 40m and water table is found at a depth of 53 - 58m BGL the quarrying activity will not intersect ground water table.

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 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 Rough stone processing or workshop within the project area thus there is no effluent anticipated in the mine.

### **MITIGATION MEASURES**

The following mitigation measures are suggested for water management

- Rainwater will be collected in lower part of the quarry pit by construction of garland drains to divert surface run-off and will be connected to setting tank of 5 m (l) x 5m (w) x 3m (d) to allow suspended solids to settle down if any. This collected water will act as a rain water harvesting system and will be used for dust suppression and greenbelt development
- Six month once analysis of quarry pit water and ground water quality in nearby villages will be carried out to ensure the water quality is not affected due to the quarrying activities
- Domestic sewage from site office & urinals/latrines provided in project area will be discharged through septic tank followed by soak pit system
- Only clear and settled water free from silt content will be used for dust suppression and plantation purposes
- De-silting will be carried out before and immediately after the monsoon season and the settling tank and drains will be cleaned weekly, especially during monsoons
- Tippers & HEMM will be washed in a designated area and the washed water will be routed through drains to a settling tank, which has an oil & grease trap, only clear water will be reused for greenbelt development.

### **4.3 AIR ENVIRONMENT**

The air borne particulate matter is the main air pollutant in this opencast mining. The mining operation will be carried out by jackhammer drilling (35mm dia) and Hydraulic Excavators will be utilized for excavation of Rough Stone and Gravel.

#### **ANTICIPATED IMPACT**

Wind erosion of the exposed areas and the air borne particulate matter generated by quarrying operation, and transportation are mainly PM<sub>10</sub> & PM<sub>2.5</sub> and emissions of Sulphur dioxide (SO<sub>2</sub>) & Oxides of Nitrogen (NO<sub>2</sub>) due to excavation/loading equipment and vehicles plying on haul roads are the cause of air pollution in the project area.

Similarly, loading - unloading and transportation of Rough Stone and Gravel, wind erosion of the exposed area and movement of light vehicles will be a cause of pollution due to quarrying activities within a radius of 500 meters from the project area. This leads to a cumulative impact on the ambient air environment around the project area.

Anticipated incremental concentration due to this quarrying activity and net increase in emissions due to quarrying activities within 500 meters around the project area is predicted by Open Pit Source modelling using AERMOD Software.

## MITIGATION MEASURES

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

### **Advantages of Wet Drilling:-**

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

### **Blasting –**

- Establish time of blasting to suit the local conditions and water sprinkling on blasting face
- Avoid blasting i.e., when temperature inversion is likely to occur and strong wind blows towards residential areas
- Controlled blasting 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
- Before loading of material water will be sprayed on blasted material
- Dust mask will be provided to the workers and their use will be strictly monitored

### **Haul Road & Transportation –**

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

**Green Belt –**

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

**Occupational Health –**

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

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

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

**MITIGATION MEASURES**

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

## 4.5 BIOLOGICAL ENVIRONMENT

### ANTICIPATED IMPACT

- ✚ 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.

Wild life is not commonly found in the cluster area and its immediate environs because of lack of vegetal cover and surface water. Except few domestic animals, reptiles, hares and some common birds are observed in the study area.

### 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

<i>Year</i>	<i>No. of trees proposed to be planted</i>	<i>Survial %</i>	<i>Area to be covered sa.m</i>	<i>Name of the species</i>	<i>No. of trees expected to be grown</i>
I	50	80%	460	Neem,	40
II	50	80%	460	Pongamia Pinnata,	40
III	50	80%	460	Mango	40
IV	50	80%	460	Casuarina	40
V	50	80%	460		40

## 4.6 SOCIO ECONOMIC ENVIRONMENT

### ANTICIPATED IMPACT

Employment generation due to the project will provide direct employment for about 39 persons and indirectly will get employment around 70 persons.

### MITIGATION MEASURES

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

### 3. ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

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

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

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

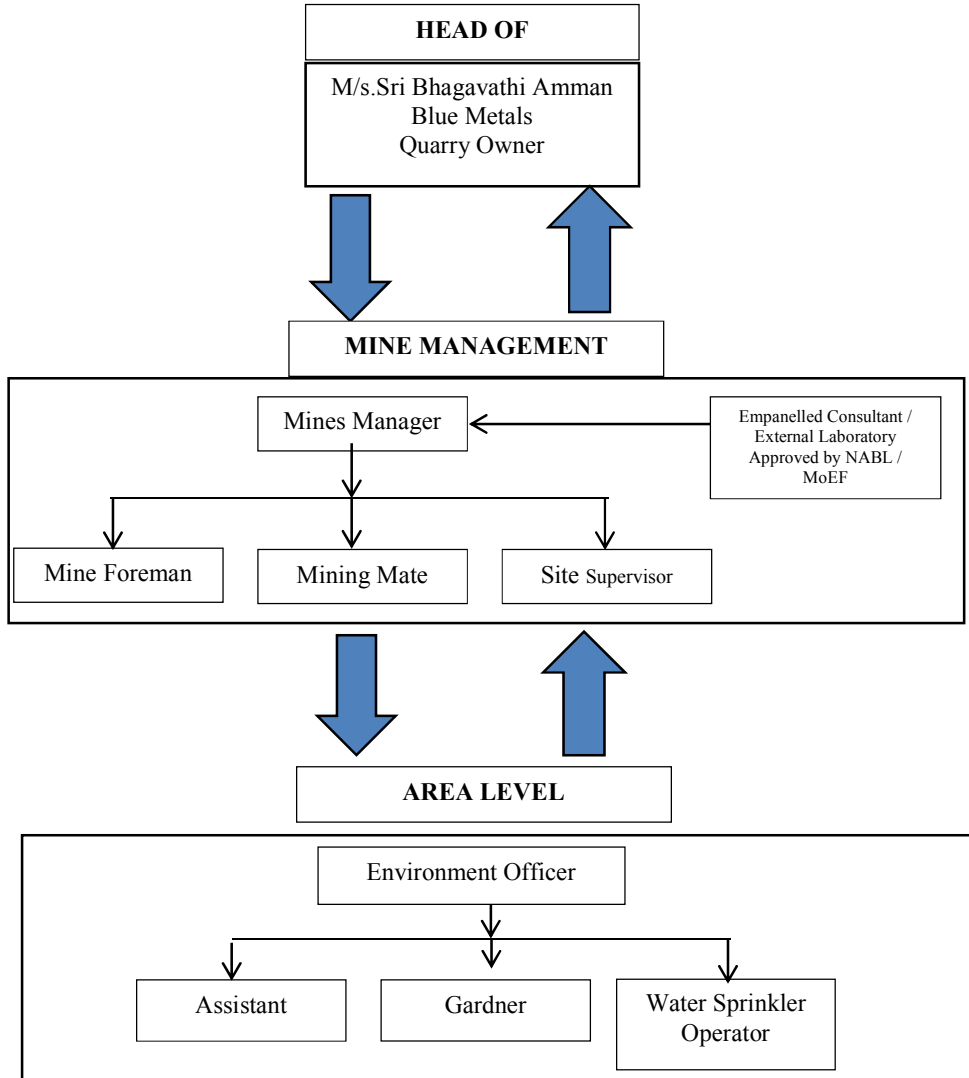
### 4. ENVIRONMENT MONITORING PROGRAM

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	8 Locations (2 Core & 6 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	7 Locations (3 SW & 4 GW)	-	Once in 6 months	Parameters specified under IS:10500, 1993 & CPCB Norms
4	Hydrology	Water level in open wells in buffer	-	Once in 6	Depth in bgl

		zone around 1 km at specific wells		months	
5	Noise	8 Locations (3 Core & 5 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	6 Locations (1 Core & 5 Buffer)	–	Once in six months	Physical and Chemical Characteristics
8	Greenbelt	Within the Project Area	Daily	Monthly	Maintenance

## 7. ADDITIONAL STUDIES

### 7.1 RISK ASSESSMENT

The methodology for the risk assessment has been based on the specific risk assessment guidance issued by the Directorate General of Mine Safety (DGMS), Dhanbad, vide Circular No.13 of 2002, dated 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 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 CLUSTER QUARRIES

Quarry	Mineable Reserve	Per Year Production	Per Day Production	Number of Lorry Load Per Day
P1	5,38,638 m <sup>3</sup>	1,07,728 m <sup>3</sup>	359 m <sup>3</sup>	30 Trips/day
E1*	1,38,845 m <sup>3</sup>	27,769 m <sup>3</sup>	93 m <sup>3</sup>	8 Trips/day
<b>Total</b>	<b>6,77,483 m<sup>3</sup></b>	<b>1,35,497m<sup>3</sup></b>	<b>452 m<sup>3</sup></b>	<b>38 Trips/day</b>

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

Location ID	Background Value (Day) dB(A)	Incremental Value dB(A)	Total Predicted dB(A)	Residential Area Standards dB(A)
Habitation Near P1	48.5	48.1	51.3	55
Habitation Near E1	47.5	42.6	49.8	

**SOCIO ECONOMIC BENEFITS FROM 3 MINES**

Location code	Employment	Project Cost	CER @ 2%
P1	39	Rs. 1,07,11,500/-	Rs 2,14,230/-
E1	9	Rs 73,92,000/-	Rs 1,47,840/-
Total	48	Rs 1,81,03,500/-	Rs 3,62,070/-

The 3 quarries shall create employment to 48 peoples and revenue will be created to government.

**PROJECT BENEFITS**

The Proposed Quarry M/s. Sri Bhagavathi Amman Blue Metals is aims to produce about 5,38,638 m<sup>3</sup> Rough Stone over a period of 5 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 Rough stone and Gravel

**5. 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.

## 6. 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