

EXECUTIVE SUMMARY FOR  
PROPOSED ROUGH STONE AND GRAVEL QUARRY  
CATEGORY – B1

EXECUTIVE  
SUMMARY FOR  
PROPOSED  
ROUGH

**STONE AND GRAVEL QUARRY CATEGORY – B1**

(Public Hearing Upgraded after Terms of Reference (ToR) as per the provisions of EIA Notification 2006 & amendments thereof)

ToR Lr.No. SEIAA-TN/F.No.10524/2023/SEAC/ToR-1672/2024, dated 08.02.2024

<b>PROPOSED QUARRY LEASE DETAILS</b>	
<b>SURVEY NOS</b>	414/1, 415A/1A and 415A/2A .
<b>VILLAGE</b>	PALAMADAI
<b>TALUK</b>	TIRUNELVELI
<b>DISTRICT</b>	TIRUNELVELI
<b>EXTENT</b>	6.60.5 HA
<b>PROPOSED PRODUCTION QUANTITY FOR FIVE YEARS</b>	ROUGH STONE - 9,26,070 M3 GRAVEL - 1,03,074 M3
<b>LAND</b>	PATTA LAND

(Sector No. 1(a) Sector No.1 as per NABET)

Category of the Project: B1 Cluster Mining, Total Cluster Area – 18.42.55 Ha  
Baseline Monitoring Period – February 2024 to April 2024

**APPLICANT**

Thiru.K. Ananthaperumal,  
S/o. Kanniah,  
160D/8, Polepettai West,  
Thoothukudi District.  
Pincode–628001.

**ORGANIZATION**

M/s. GLOBAL MINING SOLUTIONS  
(NABET ACCREDITED & ISO 9001 CERTIFIED CONSULTANT)  
PLOT NO.6, SF NO. 13/2, A2, VS CITY, RC CHETTYPATTY,  
KOTTAMETTUPATTY, OMALUR, SALEM, TAMIL NADU – 636  
455 NABET ACCREDITATION NO – NABET/EIA/2326/IA 0110



**MAY - 2024**

**EXECUTIVE SUMMARY FOR THE PROPOSED ROUGH STONE AND GRAVEL QUARRY OF THIRU. K. ANANTHAPERUMAL OVER AN EXTENT OF 6.60.5 HA LOCATED AT S.F.NOS. 414/1, 415A/1A AND 415A/2A LOCATED AT VILLAGE - PALAMADAI, TIRUNELVELI TALUK, TIRUNELVELI DISTRICT, TAMIL NADU STATE.**

## **EXECUTIVE SUMMARY**

### **1.1 INTRODUCTION**

Thiru.K.Ananthaperumal has obtained Precise Area Communication Letter from Joint Director/Assistant Director (i/c), Department of Geology and Mining, Tirunelveli to quarry out 9,26,070 m<sup>3</sup> of Rough Stone and 1,03,074 m<sup>3</sup> of Gravel from an extent of 2.36.0 Ha located in S.F. No. 414/1, 415A/1A and 415A/2A at Palamadai Village, Tirunelveli Taluk, Tirunelveli District, Tamil Nadu State.

As per EIA notification, 2006 and its subsequent amendments the proposed "Rough Stone and Gravel Quarry of Thiru.K.Ananthaperumal mines cluster falls under Schedule 1(a) of EIA Notification and its subsequent amendments the project comes under Category B1. The ToR for preparation of EIA/EMP report of the project was approved vide letter No.SEIAA-TN/F.No.10524/2023/SEAC/ToR-1672/2024, Dated 08.02.2024. This report has been prepared in line with the approved TOR for production of maximum excavation of 9,26,070 m<sup>3</sup> of Rough Stone and 1,03,074 m<sup>3</sup> of Gravel.

<b>S.No.</b>	<b>Description</b>	<b>Status/Remarks</b>
1.	Sector	1(a), non-coal mining
2.	Category of the project	B1
3.	Proposed mineral	Rough Stone and Gravel
4.	Type of Lease	Fresh Lease
5.	Extent of the lease	6.60.5 Ha
6.	Proposed depth of Mining	27m (BGL)
7.	Method of mining	Opencast Semi-mechanized
8.	Proposed lease period	5 Years

9.	Proposed Environmental Clearance	10 Years
10.	Proposed production quantity for five years	Rough Stone - 9,26,070 m <sup>3</sup> Gravel-1.03,074 m <sup>3</sup>

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The Lessee Thiru.K. Ananthaperumal is an individual with sound experience in the identification, quarrying and marketing of Rough Stone. The proposed land is a Patta land attached as **Annexure 6**.

## **1.2 LOCATION**

This project site is located in Palamadai Village, Tirunelveli Taluk, Tirunelveli District, Tamil Nadu State with Latitude 08°48'10.57"N to 08°48'27.47"N and Longitude 77°45'06.01"E to 77°45'11.28"E with Survey of India Topo Sheet No. 58-H/13. To conduct the study, the proposed mine lease area (core zone) and an impact zone of 10 km radius (called buffer zone) around the proposed mine site were considered. The EIA report is based on three months baseline data (i.e. February 2024 to April 2024)

## **1.3 GEOLOGY**

The rock type noticed in the area for lease is Charnockite which contains mostly Quartz and Feldspar with some ferromagnesian minerals. The Charnockite is part of peninsular Gneisses, a high grade metamorphic rock. The strike of the Charnockite formation is N45°E – S45°W with vertical dipping.

## **1. 4 PROJECT DESCRIPTION**

This is a proposed Rough Stone quarry by Opencast Semi-mechanized mining method with drilling and blasting. The quarrying is restricted up to a depth of 40m above ground level. The geological reserves is estimated to be 29,67,300 m<sup>3</sup> of Rough Stone and 1,31,880 m<sup>3</sup> Gravel. The mineable reserve calculated by deducting 10m safety distance and bench loss. The mineable reserves is 13,22,445 m<sup>3</sup> of Rough Stone and 1,03,074 m<sup>3</sup> Gravel which will be recovered at the rate of

100% recovery upto a depth of 40m above ground level for the period of five years.

- It is proposed to quarry out rough stone with 5m bench height, 5m width with 80° slope using conventional Open cast Semi-Mechanized method. The quarry operation involves shallow jack hammer drilling, slurry blasting, excavation, Loading and transportation of Rough Stone.

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- There is no overburden anticipated during entire rough stone quarrying operation.

S.No.	Type of Detail	Description
1	Sector	1(a) Non coal mining
2	Fresh/Existing project	Fresh project
3	Category	B1
4	Nature of mineral	Rough Stone and Gravel
5	Production	9,26,070 m <sup>3</sup> of Rough Stone 1.03,074 m <sup>3</sup> of Gravel
6	Life	5 years
7	Waste generation and management	There is no overburden anticipated during the quarrying operation. Hence, no waste generation.
8	Bench height and width	Height and Width – 5m
9	Ultimate pit depth	27m (BGL)
10	End use	Rough Stone will be loaded into tippers to needy buyers for producing aggregates, M-sand.

### **1.5 PROJECT REQUIREMENTS**

The requirements of the project is given below.

S.No.	Nature of requirement	Description
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1	Water requirement	Total water requirement of 8KLD which will be procured from the outside agencies. Out of 8.0 KLD, drinking water requirement is 5.0 KLD, Green belt development and dust suppression is 3.5 KLD.
2	Power requirement	No electricity is needed for mining operations, for office demands, it will be met from the state grid.
3	Manpower requirement	Permanent employees – 20, temporary employees – 20
4	Financial requirement	The total project cost as per AMP will be INR 1,32,33,000 including Operational cost, Fixed Asset cost and EMP cost

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5	Funds for Socio economic development	INR 5.0 Lakhs is allocated. In addition, any demand raised by people during public hearing will also be met.
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**1.6 DESCRIPTION OF LEASE AREA**

The features in the study area is given below.

S. No.	Areas	Distance from proposed project			
1	Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value	Nil within 15km radius			
2	Areas which are important or sensitive for ecological reasons				
A	Wetlands, water courses or other water bodies,	Water bodies	Distance (Km)	Direction	

		Palamadai Pond	2.12	SE
		Thalaiyuthu Kulam	4.52	S
		Gangaikondan Kulam	5.02	NE
		Alagankulam Pond	5.42	SW
		Molni Pond	7.38	SE
		Indira Kulam (South Pond)	8.57	NE
		Seeniyappa Kulam	8.61	SW
		Pallamadai Kulam	8.76	NW
		Kandiyapperi Pond	9.17	SW
		Elanthakulam	10	S
		Thamirabarani River	3.42	S
		Chittar River	5.75	E
B	Coastal zone, biospheres	None in 10km radius		



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C	Mountains, forests	Thalaiyuthu RF-2.83km(W) Melapattam RF-3.94km(S)
3	Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, overwintering, migration	Nil within 15km radius

4	Inland, coastal, marine or underground waters	Nil within 15km radius
5	State, National boundaries	Nil within 15km radius
6	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas	Nil within 15km radius
7	Defence installations	Nil within 15km radius
8	Densely populated or built-up area	Pappankulam - 1.2km - NE Gangaikondan -1.7km -NW Palamadai - 1.2km - SE Pandarkulam - 2.0km - SW
9	Areas occupied by sensitive man-made land uses (hospitals, schools, places of worship, community facilities)	All facilities are available in Palamadai - 1.2km - SE
10	Areas containing important, high quality or scarce resources (ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)	The area contains rock in many places in the surrounding area.
11	Areas already subjected to pollution or environmental damage (those where existing legal environmental standards are exceeded)	Nil
12	Areas susceptible to natural hazard which could cause the project to present environmental problems (earth quakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions) similar effects	No. The area is not prone to earthquakes, floods, etc.



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The baseline data collection for meteorology, air, water, noise and soil environments

have been carried out during February to April 2024.

Air, water, noise and soil samples are collected and analyzed through NABL accredited lab.

### 1.7 AIR ENVIRONMENT

The air monitoring have been carried out in 6 locations and the results are given below.

<b>TABLE 3.3: DETAILS OF AMBIENT AIR QUALITY MONITORING LOCATIONS</b>				
<b>S. No.</b>	<b>Station Code</b>	<b>Locations</b>	<b>Distance &amp; Direction</b>	<b>Coordinates</b>
1	AAQ 1	Project site	Core Zone	08°48'10.57"N 77°45'06.01"E
2	AAQ 2	Rajvirampuram	1.61 Km, S	08°47'26.42"N 77°45'17.36"E
3	AAQ 3	Alangaraperi	2.45 Km, E	08°48'28.3"N 77°4'28.1"E
4	AAQ 4	Vadaku Thalaiyuthu	3.6 Km, W	08°47'41.46"N 77°43'16.12"E
5	AAQ 5	Pathinalamperi	4.2 Km, NE	08°49'13.62"N 77°47'13.33"E
6	AAQ6	Aladipatti	3.6 Km, N	08°50'9.62"N 77°45'46.25"E

<b>Station ID</b>	<b>Min</b>	<b>Max</b>	<b>Avg.</b>
<b>Particulate matter PM<sub>2.5</sub> (µg/m<sup>3</sup>)</b>			
AAQ-1	23.8	29.6	26.8
AAQ-2	16.6	23.1	19.85
AAQ-3	20.7	26.5	21.95
AAQ-4	23.1	31.5	27.3
AAQ-5	21.3	25.8	23.55
AAQ-6	19.4	25.3	22.35
<b>CPCB NAAQS 2009 for PM<sub>2.5</sub> - 60 µg/m<sup>3</sup></b>			
<b>Particulate matter PM<sub>10</sub> (µg/m<sup>3</sup>)</b>			
AAQ-1	57.3	67.2	62.25



AAQ-2	36.1	49.9	43
AAQ-3	46.3	56.7	51.5
AAQ-4	49.2	67.1	58.5
AAQ-5	44.5	53.3	48.9
AAQ-6	42.5	55.7	49.1
<b>CPCB NAAQS 2009 for PM<sub>10</sub> - 100 µg/m<sup>3</sup></b>			
<b>Sulphur Di-oxide as SO<sub>2</sub> (µg/m<sup>3</sup>)</b>			



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<b>Station ID</b>	<b>Min</b>	<b>Max</b>	<b>Avg.</b>
AAQ-1	3.5	4.9	4.2
AAQ-2	3.1	5.6	4.35
AAQ-3	3.2	4.9	4.05
AAQ-4	5.5	10.4	7.95
AAQ-5	3.1	5.4	4.25
AAQ-6	3.1	4.4	3.75
<b>CPCB NAAQS 2009 for SO<sub>2</sub> - 80 µg/m<sup>3</sup></b>			
<b>Oxide of Nitrogen as NO<sub>2</sub> (µg/m<sup>3</sup>)</b>			
AAQ-1	7.2	9.5	8.35
AAQ-2	6.2	8.5	7.35
AAQ-3	6.7	8.9	7.8
AAQ-4	8.1	12.7	10.4
AAQ-5	6.9	9.2	8.05
AAQ-6	7.1	8.7	7.9
<b>CPCB NAAQS 2009 for NO<sub>2</sub> - 80 µg/m<sup>3</sup></b>			

All the values of pollutant concentrations were found to be within the NAAQS Standards.

## 1.8 WATER ENVIRONMENT

Table 3.7 Results of Ground Water sampling Analysis in 6 locations								Specification /L imit (As per IS:10500: 2012 )	
Parameter	Test Parameter	Unit	GW1	GW2	GW3	GW4	GW5	Desirable	Permissible
Odour	-	AGREEABLE	AGREEABLE	Agreeable	AGREEABLE	AGREEABLE	AGREEABLE	Agreeable	Agreeable
Taste	NTU	<1	<1	<1.0	<1	<1	<1	Agreeable	Agreeable
pH	-	7.15	6.75	7.24	7.22	7.54	7.68	6.5 - 8.5	No Relaxation
Turbidity	µs/cm	1624	1720	144.1	1335	1597	1421	1	5
TDS	mg/l	975	1032	86.0	802	960	855	500	2000
Fluoride,(F)	mg/l	453	560	51.5	497	446	283	1	1.5
Total Alkalinity, (CaCO <sub>3</sub> )	mg/l	102	114	14.3	87.1	97.6	78.4	200	600
Total Hardness, (CaCO <sub>3</sub> )	mg/l	47.8	65.8	3.80	67.0	48.5	20.9	200	600
Calcium,(Ca)	mg/l	254	286	35.6	218	244	196	75	200
Calcium as CaCO <sub>3</sub>	mg/l	199	274	15.8	279	202	87.1		
Free Residual chlorine as Cl	mg/l	452	316	40.4	333	439	356		
Chloride,(Cl)	mg/l	249	269	17.6	232	242	244	250	1000



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Magnesium,(Mg )	mg/l	BDL (D.L - 0.2)	BDL (D.L - 0.2)	BDL (D.L - 0.2)	BDL (D.L - 0.2)	BDL (D.L - 0.2)	BDL (D.L - 0.2)	30	100
Nitrate, (NO <sub>3</sub> )	mg/l	201	290	20.1	190	198	209	45	No Relaxation
Sulphate, (SO <sub>4</sub> )	mg/l	0.09	0.05	BDL (D.L - 0.01)	0.08	0.06	0.04	200	400
Iron,(Fe)	mg/l	3.25	4.56	BDL (D.L - 1.0)	3.56	3.72	3.59	1	No Relaxation

Manganese, (Mn)	mg/l	0.32	0.51	BDL (D.L - 0.1)	0.49	0.41	0.57	0.1	0.3
Conductivity	mg/l	BDL (D.L - 0.05)	BDL (D.L - 0.05)	BDL (D.L - 0.05)	BDL (D.L - 0.05)	BDL (D.L - 0.05)	BDL (D.L - 0.05)	Not Specified	Not Specified

All the values were found to be within permissible limits

## 1.9 NOISE ENVIRONMENT

Noise levels were measured in 5 locations and the results are given below.

<b>Table 3.5 Noise sampling locations in the study area</b>				
<b>S. No.</b>	<b>Station Code</b>	<b>Locations</b>	<b>Distance &amp; Direction</b>	<b>Coordinates</b>
1	N1	Project site	Core Zone	08°48'10.57"N 77°45'06.01"E
2	N2	Rajvirampuram	1.61 Km, S	08°47'26.42"N 77°45'17.36"E
3	N3	Alangaraperi	2.45 Km, E	08°48'28.3"N 77°4'28.1"E
4	N4	Vadakku Thalaiyuthu	3.6 Km, W	08°47'41.46"N 77°43'16.12"E
5	N5	Pathinalamperi	4.2 Km, NE	08°49'13.62"N 77°47'13.33"E
6	N6	Aladipatti	3.6 Km, N	08°50'9.62"N 77°45'46.25"E

<b>Table 3.8 Noise monitoring results</b>					
<b>S. No</b>	<b>Location</b>	<b>Day equivalent</b>	<b>Night equivalent</b>	<b>Day equivalent limits by CPCB</b>	<b>Night equivalent limits by CPCB</b>
1	Project site	43.1	36.8	75	70
2	Rajvirampuram	45.5	37.2		
3	Alangaraperi	44.3	38.1		
4	Vadakku Thalaiyuthu	44.4	36.6		
5	Pathinalamperi	46.9	37.8		
	Aladipatti	46.1	37.8		



15	Porosity	%	23.6	25.4	27.1	22.2	20.9	22.7
16	Water Holding Capacity	Inches / foot	3.5	3.6	3.1	3.7	3.5	3.2

## **1.11 BIOLOGICAL ENVIRONMENT**

### **FLORA**

For measuring the extent of flora present in the study area, the area is divided into 4 quadrants. The flora population in each quadrant is summed up for the total population in the study area. Field survey is done. Erukku, Aavarai and Nayuruvi are found in lease area. In the buffer zone, common trees like Neem, papaya, mango,

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teak, etc and shrubs like Avarai, Aloe vera, etc, climbers like Kovai, jasmine etc are found.

### **FAUNA**

In the study area, commonly found animals like dogs, cats, bush rat, cows, birds like crow, Myna, Sparrow, etc were found.

## **1.12 LAND USE**

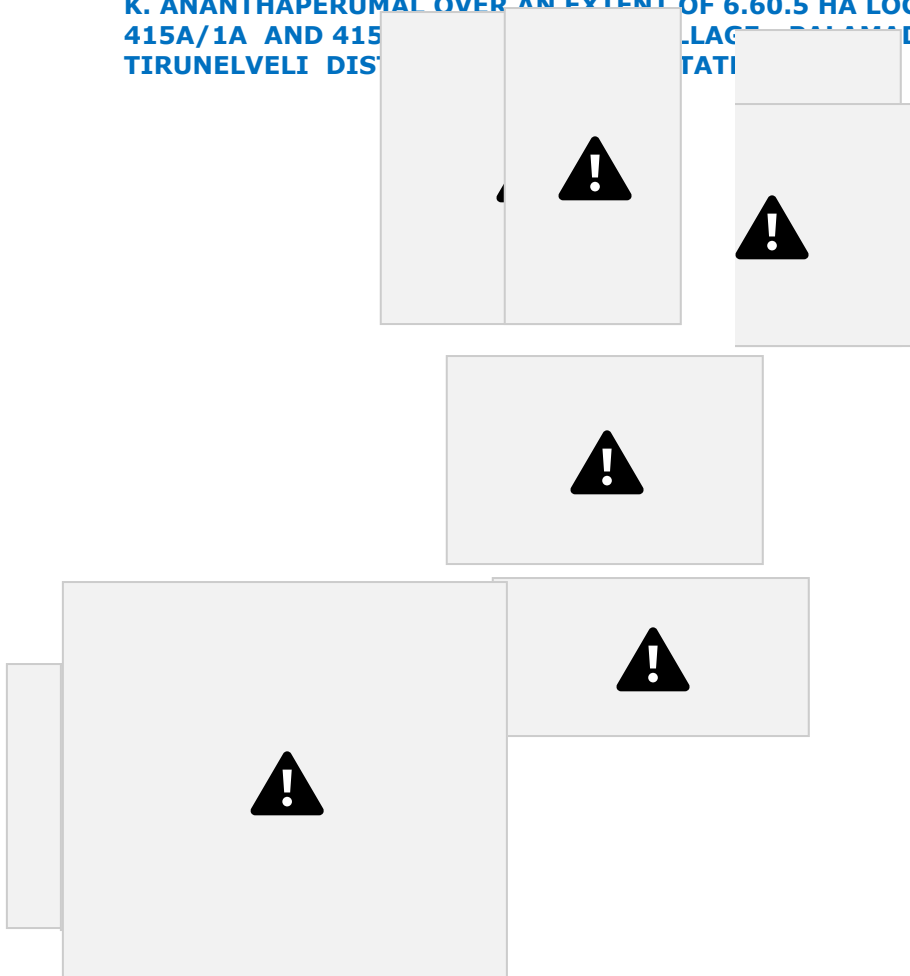
The land use land cover data is found using the LANDSAT – 9 satellite imagery. The number of bands used are 11. The land use pattern is given below:

**Table No. 3.17: Major Land Use Units of the Study Area in Percentage**

S. No	1st Level Classification	Area in (sq.km)	Percentage (%)	2nd Level Classification	Area in (sq.km)	Percentage (%)
1	Built-up or	57.85	17.75	Residential	48.38	14.84

	habitation			Commercial/Industrial	9.47	2.90
2	Agriculture	145.21	44.54	Crop/fallow land	144.5	44.33
				Plantation	0.71	0.22
3	Water bodies	45.28	13.89	Reservoir/Lake /Pond	37.60	11.53
				River/Stram	7.68	2.36
4	Waste Land	65.15	19.98	Open without scrub	18.44	5.66
				Open with scrub	46.71	14.33
5	Others	12.51	3.84	Mines	12.51	3.84
Total		326	100		326	100

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### **1.13 SOCIO ECONOMIC ENVIRONMENT**

The socio economic environment of the study area is studied by conducting primary sites through site visits and conducting sample surveys. The secondary data obtained from Census 2011 is also used.

The following data area collected from secondary data.

- Demographic pattern.
- Health pattern
- Occupational structure.
- Amenities available.

The Landuse expert visited more than 3 villages in the study area namely Gangaikondan , Thathanuthu nd Avanapperi, villages. Discussions were held with the people from nearby locality to study the social and economic conditions prevailing in the area. The expert also visited nearby hospitals, primary health centres and Senthamangalam.

The following observations were made.



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- Primary schools are available in many villages. For hospital facilities, people in the locality have to go to hospital in Palamadai which is about 1.2 SE km from the lease area.
  - Major schools with higher secondary and senior secondary schools are located in Palamadai.
  - The major Sendamangalam Union located in the area is Palamadai •
- Facilities like petrol pump stations, ATM facility are available in Palamadai

### **1.14 HYDROGEOLOGY OF THE LEASE AREA**

Since there is a pond is situated at a distance of 480 m in north direction. Thamirabarani River is located at a distance of 3.42 km in south direction of the proposed ML area. the hydrological and hydrogeological pattern of the study area is studied in detail using satellite imagery.

Thamirabarani River is the major river in the lease area. But there is no running water currently in the river. Only during monsoons, water gets stagnated at a few places.

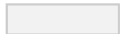
There are many tanks located in the study area, which are mostly dry throughout the year. These tanks get water only during monsoons. The factors may be monsoon failure, insufficient rainfall, poor rain water management and water consuming patterns.

### **1.15 GROUND WATER STUDY**

For Ground water study, satellite imagery is used. Water levels from monitoring levels are collected through imaging. The pre-monsoon and post-monsoon data are collected and the results are analyzed.

During field visit, it is observed that water is available in wells only after monsoon. The yield is obtained at deep levels only.

As far as the mining lease area is considered, the area is rocky and no major seepage is envisaged. The production quantity is very less and the depth proposed is 40m

  
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AGL. Hence, there will not be any major impact due to mining on water levels or ground water levels in the area.

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



Environmental impacts on the following environments are identified. • Land environment

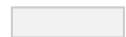
- Water environment
- Vegetation
- Fauna
- Air environment
- Noise environment
- Socio-economic impacts

#### 1.16 **LAND ENVIRONMENT: IMPACT AND MITIGATION MEASURES**

The major impact due to this project on land environment is the change in land use. Since this quarry is a small one and the production is less, mining activity will be carried out upto 40m AGL. Other than quarrying of minerals, no other change will be done since there is no dumping. To prevent soil erosion during monsoon season, garland drain will be constructed with silt traps. At the mine closure stage, 5.15.5 Ha of lease area will be left as rain water harvesting pond. 1.43.0 Ha will be developed with green belt. For this, plants like Pongamia pinnata, Syzigium cumini, Albizia lebbeck, Thespesia populnea, Bauhinia racemose, Cassia siamea, Azadirachta indica are selected. A total of 1800 trees are planned to be planted. Spacing will be 3m x 3m.

#### 1.17 **WATER ENVIRONMENT: IMPACT AND MITIGATION MEASURES**

There is no water body present inside the lease area. The entire water requirement for the project is 8.0 KLD which will be sourced from outside agencies. Negligible sewage will be generated, for which a septic tank with soak pit will be set up.



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During monsoon season, the excess rain water, if any, will be led through garland drain of 0.6m width and 0.3 m depth to the collection pond with silt traps.

Since the mining operation will be limited upto depth of 27m (BGL), there will not be any seepage. However, the rain water percolation and collection of water from seepage shall be less than 300lpm and it shall be pumped out periodically by a stand by diesel powered Centrifugal pump motivated with 7.5H.P.Motor. The quality of water is expected to be potable. Hence, water stored in the quarry pit will be pumped into the adjacent agricultural fields. Further the water can also be used for plantation purposes

The major water bodies found in the buffer zone are.

- Palamadai Pond – 2.12 km (SE)
- Thalaiyuthu Kulam - 4.52km (W)
- Gangaikondan Kulam-5.02km (NE)
- Alagankulam Pond - 5.42km (SW)
- Molni Pond- 7.38km (SE)
- Indira Kulam (South Pond)- 8.57km (NE)
- Seeniyappa Kulam - 8.61km (SW)
- Pallamadai Kulam -8.76km (NW)
- Kandiyapperi Pond-9.17km (SW)
- Elanthakulam - 10.00km (S)
- Thamirabarani River- 3.42km (S)
- Chittar River - 5.75km (E)

Since these water bodies are located outside the lease area and there is no discharge of effluent or any untreated water from the mines will be made in to these water bodies, there is no major impact. For the canal, adequate safety distance is left. The proponent will restrict the mining operation only within the lease and no other work will be carried out near the canal or any area outside the lease.

It is planned to carryout appropriate rainwater harvesting schemes and artificial recharge schemes in the area.

- Rain water falling in the quarry will be collected efficiently through garland

drains.

- Water thus collected will be passed through collection tank with silt traps. This water can be used by the proponent for water sprinkling and for green belt purposes.
- Excess water after desiltation will be provided to downstream users, if any

### **1.18 BIOLOGICAL ENVIRONMENT: IMPACT AND MITIGATION MEASURES**

#### **Impacts**

- Fauna is affected due to noise and vibration.
- Dust generation due to mining activities
- Change in land use of the lease area
- Accidental falling of animals

#### **Mitigation measures**

- Sirens will be blown before blasting in the mines. To reduce noise levels, plantation will be done. Blasting will be carried out only in the allotted time.
- To reduce dust generation, mist sprayers will be used. During transportation, the material will be covered with tarpaulin. Water sprinkling will be done to reduce generation of pollutants
- After the mine closure stage, the mine pit will be left as rain water collecting tank, which can attract bird population in the nearby areas.
- To prevent entry of animals, the mining area will be properly fenced.

### **1.19 AIR ENVIRONMENT: IMPACT AND MITIGATION MEASURES**

The major air pollutants due to mining operations are fugitive emissions like PM<sub>10</sub>, PM<sub>2.5</sub>. Other than these pollutants, gaseous emissions of sulfur dioxide (SO<sub>2</sub>) and oxides of nitrogen (NO<sub>x</sub>) due to excavation/loading equipment and vehicles plying on haul roads are the cause of air pollution in the project area.

The major impacts are Dust emission due to drilling, blasting and transportation. The major mitigation measures include Using Wet drilling methods, Allowing drilling only with PPE, Carrying out blasting only during specified times, Avoiding blasting during unfavourable weather conditions, Using explosives of good quality, Using mist sprayers Regular wetting of transport, Covering the materials carried in tippers with tarpaulin, Proper maintenance of vehicles used for transportation, Conducting regular emission tests for vehicles used for transport Development of greenbelt is proposed in the safety zone of 10m and 7.5m barriers in the lease area.

The anticipated data is calculated using AERMOD software and the projected values are found to be within limits.

## **1.20 NOISE ENVIRONMENT: IMPACT AND MITIGATION MEASURES**

### **Impacts**

- Noise generation in mining is due to operation like drilling, blasting and transportation of minerals within and outside the lease area.
- As per DGMS (Directorate General of Mines Safety) and OSHA (Occupational Safety and Health Administration) limits, the acceptable noise level is 90 dB(A) for an exposure period of 8 hours.
- Exposure to loud noise can also cause high blood pressure, heart disease, sleep disturbances, and stress. Noise pollution also impacts the health and well being of wildlife.
- Noise exceeding prescribed limits may cause impairment like abnormal loudness perception, tinnitus, which causes a persistent high-pitched ringing in the ears, paracusis or distorted hearing

### **Mitigation measures**

- As the distance between the source and receptor increases, the noise level also decreases. Hence, there will be a natural attenuation
- The proposed has planned to develop green belt in the periphery of the lease area, which diminishes sound volume by dampening them.

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- All the equipment/machinery/trucks involved will be properly maintained to control noise generation
- Conducting regular health checkups for employees involved
- Employees will be made to work on shifts to reduce their exposure time
- Providing earplugs to all employees

By adopting these measures, the noise levels will be maintained well within MoEF & CC limits since the baseline value is low.

### **1.21 VIBRATION: IMPACT AND MITIGATION MEASURES**

#### **Impacts**

- Though vibration will be only felt by the people working inside the lease area, it is usually undesired.
- Vibration may also cause flyrocks
- It may frighten the birds and small insects in the lease area. However, it will be felt only for a short period

#### **Mitigation measures**

- Carrying out blasting on limited scale, only from 12:00 PM to 2:00 PM  Control of fly rock and vibration by maintaining peak particle velocity with in standard as prescribed by the DGMS and MOEF & CC.
- Shallow depths jackhammer drilling and blasting is proposed to be carried out with minimum use of explosive
- Supervising blasting by competent and statutory foreman/ mines manager

### **1.22 SOCIO ECONOMIC ENVIRONMENT**

#### **Impact and Mitigation measures**

No land is acquired from anyone. No rehabilitation is needed. Hence, there is no negative impact. The proponent has planned to spend INR 5,00,000 for CER activities. This amount will be subjected to change after public hearing.

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### **1.23 OCCUPATIONAL HEALTH**

#### **Impacts**

Dust generation due to drilling and blasting, Noise generation due to drilling and blasting, unexpected accidents. Continuous exposure to dust causes Pneumonia, Tuberculosis, Rheumatic arthritis and Segmental Vibration, Short term impact will be lack of sleep, high blood pressure and heart ailments. Long term exposure may lead to partial or permanent deafness, Risks include fly rocks, cracks or fissures due to improper mining methods

#### **Mitigation measures**

- Using dust suppression measures like water spraying on roads to reduce rise of air pollutants
- Providing green belt for air pollutant and noise attenuation
- Ensuring slope stability
- Employing only trained professionals for blasting
- Conducting Pre-Medical Examination for employees before inducting • Conducting periodical Medical Examination once in 6 months. • Making all first aid kits available in mines office
- Keeping fire extinguisher in place
- Educating the employees about how to handle unexpected happenings • Posting information containing emergency contact numbers in mines office
- By adopting all these measures, the safety of the employees working in the quarry will be ensured.

### **1.24 ENVIRONMENTAL MONITORING PROGRAMME**

Monitoring is done to measure the efficiency of control measures implemented. Regular monitoring of various environmental parameters like air, water, noise and soil environments is needed to assess the status of environment during the project operation. A schedule is framed with timeline to monitor various parameters during the operation of the project. To evaluate the effectiveness of environmental management programme, regular monitoring of the important environmental parameters will be taken up. Air monitoring will be carried out once in 3 months,

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water sample will be collected once in a season, noise will be monitored once in 3 months, soil samples will be analyzed once per season. For EMP, a budget of INR **11.27 lakhs** allocated.

### **1.25 PROJECT BENEFITS**

#### **Financial benefits**

- This project will contribute financially through payment of taxes like royalty, GST, etc
- The project will also contribute via CSR.
- The demands of people during public hearing will also be considered by the project proponent

#### **Social benefits**

- This project provides employment to 40 people directly. Local people will be hired for unskilled labour.
- Through CSR, nearby schools, hospitals will be benefitted.
- For CSR, INR 5,00,000 is allocated.
- Based on the demand of the people during public hearing, further funds will be allocated, if necessary.
- Various aspects of mining activities were considered and related impacts were evaluated. Considering all the possible ways to mitigate the environmental concerns Environmental Management Plan was prepared and 11.27 lakhs for the five years has been allocated as EMP cost. 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. 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.

