

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

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

ToR Identification No. TO25B0108TN5214231N (F.No. 11992), Dated: 18.06.2025

PROPOSED QUARRY LEASE DETAILS	
SURVEY NO	570(P) & 571(P)
VILLAGE	THARUVAI
TALUK	PALAYAMKOTTAI
DISTRICT	TIRUNELVELI
EXTENT	1.95.50 HA
CLUSTER EXTENT	14.64.5 HA
PROPOSED PRODUCTION QUANTITY FOR FIVE YEARS	2,89,000 m ³ OF ROUGH STONE, 14,620 m ³ OF WEATHERED ROCK AND 15,136 m ³ OF GRAVEL
LAND	CONSENT PATTA LAND

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

Category of the Project: B1 Cluster Mining, Total Cluster Area – 14.64.5 Ha

Baseline Monitoring Period – March 2024 to May 2024

APPLICANT

TVL. SRI DURGAMBIKA BLUE METALS,
PROP. THIRU.S.SUBASH CHANDRA BOSE,
NO.1A/115, KADITHANKULAM, THARUVAI VILLAGE,
PALAYAMKOTTAI TALUK,
TIRUNELVELI DISTRICT – 627 356.

ENVIRONMENTAL CONSULTANT	LABORATORY
M/s. GLOBAL MINING SOLUTIONS (NABET Accredited & ISO 9001 Certified Consultant) Plot No. 6, S.F.No. 13/2, A2, VS City, RC Chettypatty, Kottamettupatty, Omalur, Salem, Tamil Nadu – 636 455. NABET Accreditation No: NABET/EIA/23-26/SA 0241 Valid up to: 04.01.2026 Contact: 97502 23535 & 94446 54520 Email: infoglobalmining@gmail.com, globalminingsolutionssalem@gmail.com	M/s. SHRIENT ANALYTICAL & RESEARCH LABS PRIVATE LIMITED (NABL Accredited Testing Laboratory) Valid up to: 29.09.2025 #416/15, Dhargas Road, Perungalathur, West Tambaram, Chennai, Tamil Nadu, India.

EXECUTIVE SUMMARY

1.1 OVER ALL JUSTIFICATION FOR IMPLEMENTATION OF THE PROJECT

1.1.1 INTRODUCTION

Tvl. Sri Durgambika Blue Metals, Prop.Thiru.S.Subash Chandra Bose, has obtained Precise Area communication letter from the Assistant Director, Department of Geology and Mining, Tirunelveli, vide Rc.No.M3/10059/2020, dated 11.09.2020 over an extent of 1.95.5 Ha., located at the Survey No. 570(P) & 571(P) of Tharuvai Village, Palayamkottai Taluk, Tirunelveli District, Tamil Nadu State.

As per EIA notification, 2006 and its subsequent amendments the proposed Rough Stone, Jelly & Gravel Quarry of Tvl. Sri Durgambika Blue Metals, is falls under Schedule 1(a) Mining of Minerals. It is further classified under Category B1 due to the overall extent of cluster area is 14.64.5 Ha which is >5 Ha. This cluster includes the three existing, one abandoned and two proposed Quarries. **TOR for this proposal was already obtained vide Lr.No.SEIAA-TN/F.No. 8153/SEAC/ToR-929/2020 dated 16.04.2021. Due to personal issues, Proponent further could not proceed with the proposal and subsequently the TOR was expired. As the ToR was expired, a fresh application for obtaining ToR was submitted dated 13.03.2025. Fresh ToR was obtained for this proposed project vide ToR Identification. No. TO25B0108TN5214231N Dated: 18.06.2025.** This report has been prepared in line with the approved TOR for total production of 2,89,000m³ of Rough Stone, 14,620m³ of Weathered Rock and 15,136m³ of Gravel upto a restricted depth of 42m BGL for the period for 5 years. Mine plan for this project was approved by Joint Director (Additional i/c), Department of Geology and Mining, Tirunelveli, vide Rc.No.M3/10059/2020, dated 30.10.2020.

Sl. No.	Description	Status/Remarks
1.	Sector	Non-coal mining
2.	Category of the project	B1 (Cluster)
3.	Proposed mineral	Rough Stone, Jelly & Gravel quarry
4.	Type of Lease	Proposed quarry

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5.	Extent of the lease	1.95.5 Ha
6.	Proposed depth of Mining for 5 Years	42m BGL
7.	Method of mining	Opencast mechanized
8.	Proposed lease period	5 Years
9.	Proposed Environmental Clearance	5 Years
10.	Proposed production quantity for five years	2,89,000m ³ of Rough Stone, 14,620m ³ of Weathered Rock and 15,136m ³ of Gravel

The lessee, Tvl. Sri Durgambika Blue Metals, Prop.Thiru.S.Subash Chandra Bose is an individual with sound experience in the identification of quarry, operation and marketing in the field of Rough Stone, Jelly & Gravel. The proposed land is a patta land jointly in the name of Thiru.S.Subash Chandra Bose (applicant) and Thiru. Kasirajan, vide patta No.3509. The applicant has obtained consent from the other Pattadar and got it registered.

1.1.2 LOCATION

This proposed project site is located in Tharuvai Village, Palaymkottai Taluk, Tirunelveli District, Tamil Nadu State and its Latitude: 08°38'26.34"N to 08°38'33.41"N and Longitude: 77°40'54.60"E to 77°41'00.13"E with Survey of India Topo Sheet No. 58 H/10. 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. March 2024 to May 2024)

1.1.3 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 N45⁰W – S45⁰W with dipping towards SE60⁰.

1.1.4 PROJECT DESCRIPTION

This is a proposed Rough Stone, Jelly & Gravel quarry by opencast mechanized mining method with drilling and blasting. The quarrying is restricted up to a depth of 42m below ground level. The geological reserves is estimated to be 7,82,080 m³ of Rough Stone, 19,552 m³ of Weathered Rock and 19,552 m³ of Gravel. The mineable reserve calculated by deducting safety distance and bench loss. The mineable reserves estimated to be 2,89,000 m³ of Rough Stone, 14,620 m³ of Weathered Rock and 15,136 m³ of Gravel, in which the same will be mined out in five years upto depth of 42m BGL. It is proposed to quarry out rough stone with 5m bench height, 5m width with 80° slope using conventional Opencast Mechanized method. The quarry operation involves shallow jack hammer drilling, slurry blasting, excavation, Loading and transportation of Rough Stone. There is no overburden anticipated during entire rough stone quarrying operation. The Salient features of the project are given in below table

S.No.	Type of Detail	Description
1	Sector	1(a) Non coal mining
2	Fresh/Existing project	New Project
3	Category	B1 (Cluster)
4	Nature of mineral	Minor mineral
5	Life of the mine	5 years
6	Production Quantity for five years	2,89,000 m ³ of Rough Stone, 14,620 m ³ of Weathered Rock and 15,136 m ³ of Gravel
7	Waste generation and management	Nil
8	Bench height and width	Proposed bench height & width is 5.0 m respectively and number of proposed benches is 8 (7+1) Nos
9	Ultimate pit depth	42m (BGL)
10	End use	The excavated Rough Stone and Gravel is used for construction industries for Government & Public sector projects besides catering domestic housing and infrastructure projects in and around the district.

1.1.5 PROJECT REQUIREMENTS

The requirements of the project is given below.

S.No.	Nature of requirement	Description
1	Water requirement	Total water requirement of 4.0 KLD which will be procured from the outside agencies. Out of 4.0 KLD, for drinking & domestic will be 0.9 KLD, for Green belt development will be 1.2 KLD and for dust suppression will be 1.9 KLD.
2	Power requirement	No electricity is needed for the proposed mining operation. 236.159 KL of HSD will be utilized for the entire project life.
3	Manpower requirement	Total Manpower 21 Nos. Permanent employee – 13, Temporary employee – 8
4	Financial requirement	The total Project Cost is 95.39 lakhs.
5	Funds for Socio economic development	As per MOEF & CC Notification CER cost is arrived for an amount of 5.0 Lakhs for 5 Years.

1.2 DESCRIPTION OF ENVIRONMENT IN THE STUDY AREA

The baseline data collection for meteorology, air, water, noise and soil environments have been carried out during March 2024 to May 2024. Air, water, noise and soil samples are collected and analyzed through NABL accredited lab. The features in the study area are given below.

S.No.	Areas	Distance from project site		
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	Direction
		Tank	410 m	SE
		Pachaiyar River	2.5 km	W

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		Thamirabarani River	4.74 km	NW
		Manimuttar Canal	8.5 km	S
		Kodagan Channel	6.9 km	NW
B	Coastal zone, biospheres,	Nil within 10km radius		
C	Mountains, forests	- Nil within 15km radius - Kalakad Mundanthurai Tiger Reserve – 14.84 km (NW)		
3	Environmental sensitive areas, Protected areas as per Wildlife Protection Act, 1972	Nil within 15km radius		
4	Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, overwintering, migration	Nil within 15km radius		
5	Inland, coastal, marine or underground waters	Nil within 15km radius		
6	State, National boundaries	Nil within 15km radius		
7	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas	Nil within 15km radius		
8	Defense installations	Nil within 15km radius		
9	Densely populated or built-up area	Tirunelveli, which is at a distance of 9.0 km in the N direction of the proposed site.		
10	Areas occupied by sensitive man-made land uses (hospitals, schools, places of worship, community facilities)			
11	Areas containing important, high quality or scarce resources (ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)	Nil		
12	Areas already subjected to pollution or environmental damage. (those where existing legal environmental standards are exceeded)	Nil		
13	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.		

1.3 EXISTING ENVIRONMENTAL SCENARIO

1.3.1 METEOROLOGICAL DATA

Meteorological Data Recorded at Site is given below:

Sl.no	Parameters	Min	Max
1	Temperature in °c	23.9	40.2
2	Humidity in %	33.0	99
3	Wind speed in km/hr	<1.8	29.9
4	Predominant wind direction from	W, NW	

1.3.2 AIR ENVIRONMENT

The air monitoring have been carried out in 6 locations and details of monitoring locations are given below:

SI.NO	LOCATION CODE	LOCATION	DISTANCE FROM CORE ZONE (KM)	DIRECTION
1	A1	Near Mine Lease Area	-	-
2	A2	Adaimithipankulam	1.1 km	NE
3	A3	Kandithankulam	<0.6 km	SW
4	A4	Samathuvapuram	2.0 km	E
5	A5	Ponnakudi	3.3 km	SE
6	A6	Alankulam	1.0 km	SW

The concentrations of various air pollutants at the 6 locations are given below. For all the components in the table, the unit are in $\mu\text{g}/\text{m}^3$.

RESULTS OF AIR SAMPLING ANALYSIS IN 6 LOCATIONS			
Station ID	Min	Max	Avg.
Particulate matter PM_{2.5} (µg/m³)			
AAQ-1	30.9	40.1	34.5
AAQ-2	26.1	33.7	29.3
AAQ-3	26.9	34.9	30.8
AAQ-4	25.7	32.5	28.0
AAQ-5	24.3	32.4	28.1
AAQ-6	24.4	31.2	27.2
CPCB NAAQS 2009 for PM _{2.5} - 60 µg/m ³			
Particulate matter PM₁₀ (µg/m³)			
AAQ-1	60.1	78.9	66.9
AAQ-2	53.8	67.4	60.0
AAQ-3	55.4	70.5	63.5
AAQ-4	51.4	63.5	56.7
AAQ-5	52.3	62.6	57.4
AAQ-6	49.6	61.3	55.6
CPCB NAAQS 2009 for PM ₁₀ - 100 µg/m ³			
Sulphur Di-oxide as SO₂ (µg/m³)			
AAQ-1	5.3	8.1	6.7
AAQ-2	4.2	6.9	5.6
AAQ-3	4.7	7.3	6.1
AAQ-4	4.7	6.9	5.8
AAQ-5	4.7	6.9	5.8
AAQ-6	4.2	6.5	5.5
CPCB NAAQS 2009 for SO ₂ - 80 µg/m ³			
Oxide of Nitrogen as NO₂ (µg/m³)			
AAQ-1	8.4	10.8	9.5
AAQ-2	7.3	9.8	8.7
AAQ-3	7.3	9.9	8.7
AAQ-4	7.1	10.3	8.6
AAQ-5	6.6	9.4	8.2
AAQ-6	6.2	8.7	7.8
CPCB NAAQS 2009 for NO ₂ - 80 µg/m ³			

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

1.3.3 WATER ENVIRONMENT

Six ground water samples were collected from the study area were analyzed and given in below table.

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Results of Ground Water sampling Analysis

S. No.	Test Parameter	Unit	W1	W2	W3	W4	W5	W6	Specification/Limit (As per IS:10500: 2012)	
									Desirable	Permissible
1	Odour	...	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
2	Taste	...	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	pH	...	7.41	7.53	7.35	7.74	7.13	7.38	6.5 - 8.5	No Relaxation
4	Turbidity	NTU	<1	<1	<1	<1	<1	<1	1	5
5	TDS	mg/L	452	468	389	433	586	704	500	2000
6	Fluoride, (F)	mg/L	0.45	0.48	0.29	0.41	0.72	0.48	1	1.5
7	Total Alkalinity, (CaCO ₃)	mg/L	226	219	172	179	332	258	200	600
8	Total Hardness, (CaCO ₃)	mg/L	224	257	174	257	451	469	200	600
9	Calcium, (Ca)	mg/L	54	67.3	38.3	50.8	89.7	98.5	75	200
10	Calcium as CaCO ₃		131	159	96.4	139	219	237	-	-
11	Free Residual chlorine as Cl ⁻		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)	0.2	1.0
12	Chloride, (Cl)	mg/L	141	132	144	134	92.4	193	250	1000
13	Magnesium, (Mg)	mg/L	26	23.7	16.1	29.3	59.8	51.2	30	100
14	Nitrate, (NO ₃)	mg/L	BDL (D.L-1.0)	BDL (D.L-1.0)	1.49	1.84	BDL (D.L-1.0)	1.89	45	No Relaxation
15	Sulphate, (SO ₄)	mg/L	53.2	49.9	23.2	52.4	191	102	200	400
16	Iron, (Fe)	mg/L	0.06	0.02	0.04	0.06	0.17	0.06	0.3	No Relaxation
17	Manganese, (Mn)	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)	0.1	0.3
18	Conductivity	µs/cm	739.4	798.3	629.2	708.6	872.1	1167	Not Specified	Not Specified

The TDS, Total Hardness, Calcium and Total Alkalinity values of certain water samples though they are above acceptable limits it is found to be within the prescribed Permissible limits of IS: 10500 Norms in the absence of an alternative source as per Drinking Water Specifications.

1.3.4 NOISE ENVIRONMENT

Noise levels were measured in 6 locations and the results are given below.

S. No	Location	Day equivalent (dB)	Night equivalent (dB)	Permissible noise level standards by CPCB		Zone
				Day time (dB)	Night time (dB)	
1	Near Mine Lease Area	N1	43.4	75	70	Industrial Zone
2	Adaimithipankulam	N2	45.8	55	45	Residential Zone
3	Kandithankulam	N3	46.2			
4	Samathuvapuram	N4	45.0			
5	Ponnakudi	N5	41.9			
6	Alankulam	N6	44.6			

All the values are found to be within CPCB norms.

1.3.5 SOIL ENVIRONMENT

Soil samples are collected from 6 locations and the results are given below.

S. No.	Parameter	S1- Near Mine Lease Area	S2- Adaimithip ankulam	S3- Kanditha nkulam	S4- Samathu vapuram	S5- Ponnakudi	S6- Alankulam
1	pH	6.32	7.38	7.67	6.98	7.14	6.57
2	Electrical Conductivity	108.2	134	92.43	73.12	121.4	48.36
3	Dry Content	96.65	98.23	99.05	95.89	96.93	97.43
4	Water Content	3.35	1.77	0.95	4.11	3.07	2.57
5	Organic Mater	1.21	1.44	0.86	1.12	1.34	1.14
6	Phosphorus	1.38	1.94	1.71	1.26	1.47	1.85
7	Texture	Sandy Clay loam	Silty Loam	Silty Clay Loam	Silty Clay Loam	Silty Clay Loam	Silty Clay Loam
8	Sand	48.47	34.72	11.82	6.47	15.17	9.95
9	Clay	33.47	15.34	27.00	26.79	37.97	42.79
10	Silt	18.06	49.94	61.18	66.74	46.86	47.26
11	Total Nitrogen	134	178	116	99.8	78.2	103
13	Sodium	552	439	394	362	417	494
14	Potassium	988	1195	704	791	968	1018
15	Water Holding Capacity	38	29	34	32	33	30
16	Porosity	18.5	19.4	18.2	31.4	17.4	22.3

1.3.6 BIOLOGICAL ENVIRONMENT

11.3.6.1 Flora

There are no plant species in the mining lease area. There are some plantations within 300 m radius. It contains a total of 12 species belonging to 10 families have been recorded from the buffer zone of 300 m radius. The Dominated species are *Prosopis juliflora*, *Calotropis gigantean*, *Borassus flabellifer*, *Syzygium cumini*, *Ziziphus jujube*, *Abutilon indicum*, *Ficus benghalensis*, *Acacia nilotica*, *Jatropha glandulifera*, *Morinda tinctoria*, etc.

11.3.6.2 Fauna

There is no Wild Life Sanctuary or National Park within the study area of 10 km. Domesticated animals like Cows, Buffalos, Dogs, Cats etc., are commonly found. The lease and 10 Km buffer zone does not fall in the Western Ghats ESA boundary. There is no Schedule I animals.

1.3.7 LAND USE

For Land-use and land cover study, satellite images from NRSC satellite imagery April 2021 has been used. The land use pattern in the study area is given below:

AREA ESTIMATION OF LANDUSE CATEGORIES AROUND 10 KM BUFFER OF QUARRY ML AREA			
S.No	Land use Feature	Area (Sq.Km)	Percentage
1	Agriculture/ Crop	108.69	34.96
2	Fallow Land	71.60	23.04
3	Land Without Scrub	23.23	7.48
4	Land With Scrub	68.85	22.16
5	Water bodies	26.90	8.66
6	Settlement	11.05	3.56
7	Mining/Industries	0.43	0.14
Total		310.75	100

1.3.8 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.

Based on 2011 census data, in the 10km radius there are 45 Rural villages and 4 urban areas. The total population of these 45 rural villages and 4 urban areas is 619362 in which the male population is 306370 (49.47%) and the female population is 312992 (50.53%). This shows that the male and female population ratio is almost equal. Among the total population, non-workers are about 59.50% (368728) and remaining part constitute the working population i.e. 40.50% (250634).

1.3.9 HYDROGEOLOGY OF THE LEASE AREA

There is one Tank 410m southeastern side of the area. Pachaiyar River is located at a distance of 2.5 km (W). Tirunelveli district falls in Tamiraparani river basin, which is the main river of the district. The river Tamiraparani originates from the hills in the west and enters Thoothukudi District. The other two rivers draining the district are river Nambiar and Hanumanathi of Nanguneri taluk in the south that are not part of the Tamiraparani river basin. The small part of the district in the northern part falls in river Vaippar basin.

1.4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental impacts on the following environments are identified.

- Land Environment
- Soil Environment
- Water Environment
- Air Environment

- Noise Environment
- Biological Environment
- Socio Economic Environment

1.4.1 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 42m BGL. 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, 1.51.0 Ha of lease area will be left as rain water harvesting pond, 0.01.0Ha will be Infrastructure, 0.01.0Ha will be the mine roads, 0.22.5 will be undisturbed and 0.20.0 Ha will be covered with vegetation.

1.4.2 WATER ENVIRONMENT: IMPACT AND MITIGATION MEASURES

- There is no water body present inside the lease area. The entire water requirement for the project is 4.0 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.
- During monsoon season, the excess rain water, if any, will be led through garland drain to the collection pond with silt traps.
- The mining activity is not likely to intersect ground water as the ground water table occurs at a depth of 60m in rainy seasons. The mining will go up to the maximum depth of 42m BGL. So, there will be no chance of intersecting the ground water table by the mining activity.
- The major water bodies found in the buffer zone are:
 - Tank – 410 m (SE),
 - Pachaiyar River - 2.5 km (W),
 - Thamirabarani River – 4.74 km (NW),
 - Manimuttar Canal - 8.5 km (S),
 - Kodagan Channel - 6.9 km (NW)

- 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 into these water bodies, there is no major impact.
- It is planned to carryout appropriate rainwater harvesting schemes and artificial recharge schemes in the area.

1.4.3 BIOLOGICAL ENVIRONMENT: IMPACT AND MITIGATION MEASURES

- The mine lease area is devoid of major plantation. Shrubs and bushes are majorly found within the lease area. During mining operation, to mitigate CO₂ emission due to mining activities, it is recommended to plant trees all around the mine area to offset the carbon emission.
- PP have to plant 200 saplings. Therefore, the safety zone area of 0.20.00 Ha will be maintained as a green belt area and will be planted with local Species as follows.

Year	Species	No. of trees	Spacing	Survival
I	Neem, Pungam, vaigai	200	3m x 3m	80%
II		0		
III		0		
IV		0		
V		0		
Total		200		

- Capital cost of 0.20 Lakhs and Recurring cost of 0.04 Lakhs per year has been included in EMP cost for greenbelt development.
- During mining activity major impacts like disturbance to animals, dust generation, change in land use & accidental fall of animals may occur. Below mitigation measures are followed to reduce the above impacts:
 - 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.
 - Proper planning of Habitat improvement program

- To prevent entry of animals, the mining area will be properly fenced.

1.4.4 AIR ENVIRONMENT: IMPACT AND MITIGATION MEASURES

- The major Air pollutants due to mining operations are fugitive emissions like PM_{10} , $PM_{2.5}$. Gaseous emissions like sulfur dioxide (SO_2) and oxides of nitrogen (NO_x) occurs due to excavation/loading equipment and due to vehicles plying on haul roads. Dust emission occurs due to drilling, blasting and transportation.
- The major mitigation measures include, Practicing Wet drilling during drilling operation, Water sprinkling in haul roads & loading area etc., providing dust masks for mines workers, Proper maintenance of vehicles used for transportation, conducting regular emission tests for vehicles used for transport, Development of greenbelt proposed in the safety zone of 7.5m barriers in the lease area.
- The predicted maximum Ground Level Concentration within the mine lease area is estimated to be about $2.30 \mu g/m^3$ of $PM_{2.5}$ & $5.09 \mu g/m^3$ of PM_{10} .
- The post project Concentrations of PM_{10} , $PM_{2.5}$ after adopting necessary control measures shows that even in the worst-case scenario, the resultant added concentrations with baseline figures (GLC - base line + incremental) indicate that the values of ambient air quality for PM_{10} are in the range of $62.1 \mu g/m^3$ to $84.2 \mu g/m^3$ and for $PM_{2.5}$ are in the range of $32.6 \mu g/m^3$ to $42.7 \mu g/m^3$ which are within the statutory limits in each case.

1.4.5 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) limits, the acceptable noise level is 85 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 decreases. Hence, there will be a natural attenuation.
- ✚ The proponent has planned to develop green belt in the periphery of the lease area which diminishes sound volume by dampening them.
- ✚ All the equipment/machinery/tippers 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.
- ✚ Use of ear muffs by the workers with occupational exposure to noise.
- ✚ Providing green walls/nets wherever possible.

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

1.4.6 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 within the standard as prescribed by the DGMS and MOEF&CC.
- ✚ Drilling parameters like depth, diameter and spacing will be properly designed to give proper blast;
- ✚ Supervising blasting by competent and statutory Foreman/ Mines Manager.

1.4.7 SOCIO ECONOMIC ENVIRONMENT

The proposed ML is a Patta land. There are no habitations or hutments in the core zone area and no rehabilitation or resettlement problems will arise. The proponent has planned to spend INR 5,00,000/- for CER activities for 5 Years.

1.4.8 OCCUPATIONAL HEALTH & SAFETY

Impacts

Mining activity may cause various health problems to the mines workers as follows:

- ✦ Dust generated during excavation, drilling, stone cutting, sizing and transportation may cause health problems like Silicosis, Asthma, Tuberculosis and other respiratory lungs disorders etc.
- ✦ Heavy weight lifting by the workers may cause injuries to arms, legs and back.
- ✦ Noise generated during the mining activity may cause Noise Induced Hearing Loss (NIHL).
- ✦ Risks include fly rocks, cracks or fissures due to improper mining methods leads to unexpected accidents.

Mitigation measures

- ✦ The mines worker will be provided with dust mask to minimize the inhalation of the dust.
- ✦ Water sprinkling twice in a day is in practice on the haul roads, near excavation and roads to reduce the fugitive dust emission.
- ✦ Ear muffs will be supplied to the workers working in the noise prone area
- ✦ The mining site will be supplied with first aid facilities and the entire mines worker will have access to that.
- ✦ 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 as per DGMS.
- ✦ 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.

1.5 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, 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. Monitoring of the environmental parameters would be done at appropriate and sensitive areas.
- Once the data thus obtained will be incorporated in the EC Compliance report submitted to the Regional office, MoEF&CC. The measurement methodologies will be as per CPCB/BIS/MoEF&CC/DGMS norms.
- Finally, the total EMP Cost of 18.07 Lakhs for a period of Five years have been proposed. i.e., Capital cost of 7.07 Lakhs + Recurring cost of 11.00 lakhs (For 5 Years @ 5% Escalation).

1.6 PROJECT BENEFITS

Financial benefits

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

Social benefits

- This project provides employment to 21 people directly & indirectly. Local people will be hired for unskilled labour.
- For CER, INR 5,00,000/- Lakhs will be allocated through which nearby schools, hospitals will be benefitted.

1.7 CONCLUSION

Various aspects of mining activities were considered, and related impacts were evaluated. Considering all the possible ways to mitigate the Environmental concerns, an Environmental Management Plan was prepared, and 18.07 Lakhs has been allocated for the same. The EMP is dynamic, flexible, and subjected to periodic review. For projects where 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 have a positive impact on the study area.



ANNEXURE-1

Rc. No.M3/10059/2020

District Collector's Office,
Geology and Mining,
Tirunelveli.

dated. 11.09.2020



Notice

Sub: Mines and Quarries - Minor Minerals -
Roughstone, Jelly and Gravel - Tirunelveli District
- Palayamkottai Taluk - Tharuvai Village - SF.
Nos. 570(P) & 571(P) - over an extent of 1.95.5
hectares of patta lands - Quarry lease
application preferred by Tvl. Sri Durgambika
Blue Metals, Prop.S.Subash Chandra Bose -
Precise area communicated - Approved Mining
Plan and Environmental clearance - Called for -
Reg.

- Ref:**
- i. Quarry lease application preferred by Tvl. Sri Durgambika Blue Metals, Prop.S.Subash Chandra Bose, dated. 13.03.2020.
 - ii. The Sub - Collector, Tirunelveli Letter No. A5/1103/2019, dated. 10.08.2020.
 - iii. Inspection report of the Assistant Director of Geology and Mining, Tirunelveli dated.
 - iv. G.O (Ms) No. 169, Industries (MMC-1) Department dated. 04.08.2020.

Tvl. Sri Durgambika Blue Metals, Prop.S.Subash Chandra Bose, residing at 1A/115, Kandithankulam, Tharuvai Village, Palayamkottai Taluk, Tirunelveli District has preferred on 13.03.2020 application for grant of quarry lease for quarrying Roughstone, Jelly, Gravel over an extent of 1.95.5 hectares of patta lands in SF. Nos. 570(P) & 571(P) of Tharuvai Village, Palayamkottai Taluk, Tirunelveli District for a period of 5



years under Rule 19 (1) of Tamil Nadu Minor Mineral Concession Rules, 1959 vide reference 1st cited.

2. The Sub-Collector, Tirunelveli and the Assistant Director of Geology and Mining, Tirunelveli furnished their reports in the reference 2nd and 3rd cited respectively and recommended for grant of quarry lease in the applied area subject to certain conditions.

3. Based on the recommendations of the Sub-Collector, Tirunelveli and the Assistant Director of Geology and Mining, Tirunelveli, the quarry lease application preferred by the applicant Tvl. Sri Durgambika Blue Metals, Prop.S.Subash Chandra Bose for grant of quarry lease for quarrying and transportation of Roughstone, Jelly and Gravel in the subject area has been considered for grant for a period of 5 years and precise area is hereby communicated over an extent of 1.95.5 hectares of patta land in SF. Nos. 570(P) & 571(P) of Tharuvai Village, Palayamkottai Taluk, Tirunelveli District under amended Rule 41 (4) Tamil Nadu Minor Mineral Concession Rules, 1959 with a direction to the applicant to produce mining plan for approval of the Assistant Director of Geology and Mining subject to the following conditions.

- i. A safety distance of 7.5 meters should be provided to the adjoining patta lands.
- ii. No hindrance shall be caused to the adjoining pattadars' lands while carrying out quarrying operations.
- iii. No dimensional blocks with a size of 30c.m x 30c.m x 30cm suitable for polishing shall be produced.
- iv. Environmental Clearance should be obtained from the State Level Environment Impact Assessment Authority, Chennai.

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4. In view of the above, you are hereby directed to submit mining plan duly prepared by a Recognized Qualified Person in respect of the precise area communicated for approval of the Assistant Director of Geology and Mining, Tirunelveli within a period of 90 days from the date of receipt of this notice as required under rule 41 (5) of Tamil Nadu Minor Mineral Concession Rules, 1959.



5. You are further directed to produce Approved Mining Plan and Environmental Clearance obtained from the State Level Impact Assessment Authority (SEIAA) as required under Rule 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 for grant of quarry lease for quarrying Roughstone, Jelly and Gravel in respect of the precise area communicated.

[Signature]
11/09/2021
Assistant Director,
Geology and Mining,
Tirunelveli.

To

Tvl. Sri Durgambika Blue Metals,
Prop.S.Subash Chandra Bose,
1A/115, Kandithankulam,
Tharuvai village,
Palayamkottai Taluk,
Tirunelveli District.

[Signature]
11/9/2021

[Signature]



ANNEXURE-2

MINE PLAN APPROVAL LETTER

From

Thiru.A.Arumuganainar, M.Sc.,
Joint Director/
Assistant Director(i/c)
Geology and Mining,
Tirunelveli.

To

Tvl. Sri Durgambika Blue Metals,
Prop.S.Subash Chandra Bose,
1A/115, Kandithankulam,
Tharuvai Village,
Palayamkottai Taluk,
Tirunelveli District.

Rc. No. M3/10059/2020, dated. 30.10.2020

Sir,

Sub : Mines and Minerals - Minor Minerals -
Roughstone, Jelly and Gravel - Tirunelveli District -
Palayamkottai Taluk - Tharuvai Village - SF. Nos.
570(P) & 571(P) - over an extent of 1.95.5
hectares of patta lands - Quarry lease
application preferred by Tvl. Sri Durgambika Blue
Metals, Prop.S.Subash Chandra Bose - precise
area communicated - draft mining plan
submitted - Approval accorded - Reg.

- Ref :**
- 1) Quarry lease application preferred by Tvl. Sri Durgambika Blue Metals, Prop.S.Subash Chandra Bose, dated. 13.03.2020.
 - 2) Ministry of Environment and Forest, Government of India, Office Memorandum No. L-1011/47/20112 -IA-11(M), dated: 18.05.2012.
 - 3) Commissioner of Geology and Mining, Chennai letter Rc.No.3868/LC/2012, dated: 19.11.2012 & 07.11.2014.
 - 4) G.O. (Ms). No. 79, Industries (MMC1), Department, dated: 06.04.2015.
 - 5) This office Notice No. M3/10059/2020, dated. 11.09.2020.

- 6) Letter dated. 29.10.2020 received from the applicant.

Tvl. Sri Durgambika Blue Metals, Prop.S.Subash Chandra Bose, residing at 1A/115, Kandithankulam, Tharuvai Village, Palayamkottai Taluk, Tirunelveli District has preferred on 13.03.2020 application for grant of quarry lease for quarrying Roughstone, Jelly, Gravel over an extent of 1.95.5 hectares of patta lands in SF. Nos. 570(P) & 571(P) of Tharuvai Village, Palayamkottai Taluk, Tirunelveli District for a period of 5 years under Rule 19 (1) of Tamil Nadu Minor Mineral Concession Rules, 1959 vide reference 1st cited.

2. In the reference 5th cited, above precise area has been communicated based on the recommendations of Sub-Collector, Tirunelveli and the Assistant Director of Geology and Mining, Tirunelveli, the quarry lease application preferred by the applicant company Tvl. Sri Durgambika Blue Metals, Prop.S.Subash Chandra Bose for grant of quarry lease for quarrying roughstone, jelly, gravel in the subject area has been considered for grant for a period of 5 years and precise area is hereby communicated over an extent of 1.95.5 hectares of patta land in SF. Nos. 570(P) & 571(P) of Tharuvai Village, Palayamkottai Taluk, Tirunelveli District.

3. In response to the precise area communicated, the applicant has submitted three copies of draft Mining Plan duly prepared by a Qualified Person and requested for approval of the same vide reference 6th cited.

4. The contents of the draft Mining Plan submitted in respect of the precise area communicated have been verified with reference to field conditions. The co-ordinates of all the corners of the lease applied area were verified with the Global Positioning System (GPS) and the

same are found to be correct. All the conditions stipulated in the precise area communicated have been incorporated in the Mining Plan. The required safety distance of 7.5 metres for the adjacent patta lands have been clearly demarcated.

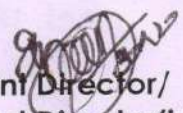
5. In exercise of the powers vested under sub rule (2) and (5) of Rule 41 of Tamil Nadu Minor Mineral Concession Rules, 1959, I hereby approve the mining plan subject to the following conditions:-

- i. The mining plan is approved without prejudice to any other order or direction from any court of contempt jurisdiction.
- ii. The mining plan is approved without prejudice to any other Law applicable to the quarry lease from time to time whether such laws are made by the Central Government, State Government or any other authority.
- iii. The approval of the mining plan does not in any way imply the approval of the Government in terms of any other provisions of the Mines and Minerals (Development and Regulation) Act 1957, or any other connected laws including Forest (Conservation) Act, 1980, Forest Conservation Rules, 1981, Environment Protection Act, 1980, Indian Explosives Act, 1884 (Central Act IV of 1884) and the Rules made there under and the Tamil Nadu Minor Mineral Concession Rules, 1959.
- iv. Quarrying operations should be carried out in accordance with the Approved Mining Plan.
- v. The applicant is entitled for production of 2,89,000 cubic meters of Roughstone, 14,620 cubic meters of Weathered rock and 15,136 cubic meters of Gravel for a period of 5 years as per the Approved Mining Plan.
- vi. A safety distance of 7.5 meters should be provided to the adjoining patta lands.

- vii. No hindrance shall be caused to the adjoining pattadars, lands and public while quarrying and transportation of mineral from the subject area.
- viii. No dimensional blocks with a size of 30c.m x 30c.m x 30cm suitable for polishing shall be produced.
- ix. Environmental Clearance should be obtained from the State Level Environment Impact Assessment Authority, Chennai.

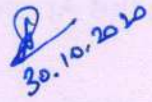
6. As directed by the Assistant Director(i/c) of Geology and Mining, Tirunelveli in the reference 6th cited, you are hereby requested to produce Environmental Clearance obtained from the State Level Environment Impact Assessment Authority (SEIAA), Chennai as applicable under Rule 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 for grant of quarry lease, in respect of the precise area communicated.

Encl: Approved Mining Plan.


Joint Director/
Assistant Director(i/c),
Geology and Mining,
Tirunelveli.

Copy submitted to:

The Chairman
State Level Environmental
Impact Assessment Authority,
Chennai.


30.10.2020



ANNEXURE-3

From

Thiru.A.Arumuganainar, M. Sc.,
Joint Director/
Assistant Director(i/c),
Geology and Mining,
Tirunelveli.

To

The Chairperson,
SEIAA, Tamil Nadu,
3rd, Floor, Panagal Maligai,
No. 1, Jeenis Road,
Saidapet, Chennai - 15.

Rc. No.M3/10059/2020, dated: 07.11.2020

Sir,

Sub: Mines and Minerals - Minor Minerals - Roughstone, Jelly and Gravel - Tirunelveli District - Palayamkottai Taluk - Tharuvai Village - SF. Nos. 570(P) & 571(P) - over an extent of 1.95.5 hectares of patta lands - Quarry lease application preferred by Tvl. Sri Durgambika Blue Metals, Prop.S.Subash Chandra Bose - Certain Particulars requested - for obtaining Environmental Clearance - furnished - reg.

- Ref:**
- 1 Quarry lease application preferred by Tvl. Sri Durgambika Blue Metals, Prop.S.Subash Chandra Bose, dated. 13.03.2020.
 - 2 Ministry of Environment and Forest, Government of India, Office Memorandum No. L-11011/47/20112 - 1A - 11(M), dated. 18.05.2012.
 - 3 This office Notice No. M3/10059/2020, dated. 11.09.2020.
 - 4 Mining Plan Approval letter No. M3/10059/2020, dated. 30.10.2020.
 - 5 Letter dated: 31.10.2020 received from Tvl. Sri Durgambika Blue Metals, Prop.S.Subash Chandra Bose
 - 6 G.O (Ms) No. 169, Industries (MMC-1) Department dated. 04.08.2020.



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Tvl. Sri Durgambika Blue Metals, Prop.S.Subash Chandra Bose, residing at 1A/115, Kandithankulam, Tharuvai Village, Palayamkottai Taluk, Tirunelveli District has preferred on 13.03.2020 application for grant of quarry lease for quarrying Roughstone, Jelly, Gravel over an extent of 1.95.5 hectares of patta lands in SF. Nos. 570(P) & 571(P) of Tharuvai Village, Palayamkottai Taluk, Tirunelveli District for a period of 5 years under Rule 19 (1) of Tamil Nadu Minor Mineral Concession Rules, 1959 vide reference 1st cited.

2. In the reference 3rd cited, above precise area has been communicated based on the recommendations of Sub-Collector, Tirunelveli and the Assistant Director of Geology and Mining, Tirunelveli, the quarry lease application preferred by the applicant company Tvl. Sri Durgambika Blue Metals, Prop.S.Subash Chandra Bose for grant of quarry lease for quarrying roughstone, jelly, gravel in the subject area has been considered for grant for a period of 5 years and precise area is hereby communicated over an extent of 1.95.5 hectares of patta land in SF. Nos. 570(P) & 571(P) of Tharuvai Village, Palayamkottai Taluk, Tirunelveli District.

3. The Mining Plan submitted by the lessee, Tvl. Sri Durgambika Blue Metals, Prop.S.Subash Chandra Bose for quarrying roughstone has been approved vide this office letter No.M3/10059/2020, dated. 30.10.2020 for obtaining Environmental Clearance as per the newly introduced Rule Number 41 and 42 of Mineral Concession Rules 1959.

4. In the reference 5th cited, Tvl. Sri Durgambika Blue Metals, Prop.S.Subash Chandra Bose has requested to furnish certain particulars such as existing / proposed / abandoned mines within a radial distance of 500 meters from the periphery of the existing mining lease hold area for obtaining environmental clearance from the State Level Environment Impact Assessment Authority, Chennai.



5. The details of quarry leases granted for Roughstone falling within a radial distance of 500 meters from the subject leasehold area are furnished below:-

Sl. No.	Name of the Lessee	Village & SF. No.	Extent - Hectares	Lease status
1. Existing quarries				
1.	P.Marimuthu, S/o.Petchi Thevar, 1/3A, Kasba Mel Bagam , Ponnagudi, Palayamkottai, Tirunelveli.	Tharuvai(V) & 522/1, 522/2, 534, 535(P)	4.73.5	Proceeding No. M1/36802/2016, dt.22.03.2018 for a period 5 years from 19.04.2018 to 18.04.2023
2.	S.Sankar, S/o.R.Subramaniam, 131/1, APT Road, Erode District	Tharuvai(V) & 524(P)	1.60.0	Proceeding No. M1/43375/2015, dt.31.03.2018 for a period 5 years from 17.04.2018 to 16.04.2023
3.	Tvl. Sri Durgambika Blue Metals, 1A/115, Kandithankulam, Tharuvai, Tirunelveli	Tharuvai(V) & 570(P)	1.38.5	Proceeding No. M3/6065/2019, dt.02.03.2019 for a period 5 years from 24.07.2018 to 16.04.2023
2. Abandoned quarries				
1.	S.Subbaiah, S/o.Sorna Thevar,	Tharuvai (v) & 568/1 & 569/1B	2.63.5	Proceeding No. M1/41558/2011, dt.20.01.2012 for a period 5 years from 07.02.2012 to 06.02.2017.

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3. proposed quarries

1.	Tvl.Sri Durgambika Blue Metals, Prop.S.Subash Chandra Bose, 1A/115, Kandithankulam, Tharuvai (v), Palayamkottai Taluk, Tirunelveli District.	Tharuvai (v) & 570(P) & 571(P)	1.95.5	Proposed quarry
2.	S.Kasirajan, 760, Bazzar Street, Seevalaperi, Palayamkottai Taluk, Tirunelveli.	Tharuvai(v) & 530/3A, 531/1A, 532, 533/1, 568/5A(P) & 569/3A	4.97.0	Proposed quarry

6. In view of the above it is recommended that Environmental Clearance may be issued in favour of the applicant subject to the usual terms and conditions.


Joint Director/
Assistant Director(i/c),
Geology and Mining,
Tirunelveli.


7/11/2020

