DRAFT 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.9971/SEAC/ToR- 1495/2023, Dated 22.06.2023

PROPOSED QUARRY LEASE DETAILS	
SURVEY NOS	253/7, 259/5, 259/2 & 259/4
VILLAGE	KARADIKUDI
TALUK	ANAICUT
DISTRICT	VELLORE
EXTENT	2.31.5 HA
PROPOSED PRODUCTION QUANTITY (FIVE YEARS)	ROUGH STONE : 2,08,760 m^3 GRAVEL : 34,184 m^3 DEPTH: 32m (17m AGL + 15m BGL)
LAND	PATTA LAND

(Sector No. 1(a) Sector No.1 as per NABET)
Category of the Project: B1 Cluster Mining, Total Cluster Area – 10.33.5 Ha
Baseline Monitoring Period – October to December 2023

APPLICANT

THIRU.R. NATARAJAN

S/O. RANGASAMY

NO.147, AYYAGOUNDARPATTI,

KOLLAMANGALAM VILLAGE, GUDIYATHAM TALUK,

VELLORE DISTRICT, PIN CODE– 635809.

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

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OCTOBER - 2024

EXECUTIVE SUMMARY

1.0 OVER ALL JUSTIFICATION FOR IMPLEMENTATION OF THE PROJECT

1.1 INTRODUCTION

Thiru.R.Natarajan S/o. Rangasamy, Lessee, has obtained Precise Area Communication Letter from Assistant Director, Department of Geology and Mining, Vellore to quarry out 2,08,760 m^3 of Rough Stone and 34,184 m^3 of Gravel over an extent of 2.31.50 Ha., located at the Survey No. 253/7, 259/5, 259/2 and 259/4 of Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu State.

As per EIA notification, 2006 and its subsequent amendments the proposed "Rough Stone and Gravel Quarry" of Thiru.R.Natarajan S/o. Rangasamy 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 ToR Lr.No.SEIAA-TN/F.No.9971/SEAC/ToR-1495/2023, Dated 22.06.2023. This report has been prepared in line with the approved TOR for production of maximum excavation of 2,08,760 m^3 of Rough Stone and 34,184 m^3 of Gravel.

The lessee, Thiru.R.Natarajan S/o. Rangasamy is an individual with sound experience in the identification, quarrying and marketing of Rough Stone and Gravel. The proposed land is patta land registered in the name of applicant vide patta no.757 & 943, please refer **Annexure – 5** of draft EIA report.

Sl. No.	Description	Status/Remarks
1.	Sector	Non-coal mining
2.	Category of the project	B1
3.	Proposed mineral	Rough Stone & Gravel quarry
4.	Type of Lease	New Project
5.	Extent of the lease	2.31.50 Ha
6.	Proposed depth of mining	32m BGL (17m AGL + 15m 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	Rough Stone: 2,08,760 m^3 Gravel: 34,184 m^3

1.1.1 LOCATION

This project site is located in Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu State with Latitude 12°50'40.55"N to 12°50'49.50"N and Longitude: 78°56'07.22"E to 78°56'14.85"E with Survey of India Topo Sheet No. 57-L/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 Post Monsoon Season (October 2023 to December 2023).

1.1.2 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 with vertical dipping.

1.1.3 PROJECT DESCRIPTION

This is a proposed Rough Stone and Gravel quarry by Opencast Mechanized mining method with drilling and blasting. The quarrying is restricted up to a depth of 32m (17m AGL and 15m BGL). The geological reserves are estimated to be 5,35,500m^3 of Rough Stone and 50,134m^3 of Gravel. The mineable reserve calculated by deducting 7.5m safety distance and bench loss. The mineable reserves estimated to be 2,08,760m^3 of Rough Stone and 34,184m^3 of Gravel which will be recovered at the rate of 100% recovery.

It is proposed to quarry out rough stone and Gravel 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 and Gravel. There is no overburden anticipated

during entire Rough stone and Gravel 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
4	Nature of mineral	Minor Mineral
5	Life of the mine	5 years
6	Production Quantity for five years	Rough Stone - 2,08,760 m^3 Gravel - 34,184 m^3
7	Waste generation and management	Nil
8	Bench height and width	Proposed bench height & width is 5.0m respectively and number of proposed benches is 6 Nos (1+5).
9	Ultimate pit depth	32m (17m AGL + 15m 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.

1.1.4 PROJECT REQUIREMENTS

The requirements of the project is given below.

S.No.	Nature of requirement	Description
1	Water requirement	Total water requirement of 2.0 KLD which will be procured from the outside agencies. 1.0 KLD for drinking & domestic requirement, 0.5 KLD for green belt development and 0.5 KLD for dust suppression.
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 – 11, temporary employees – 13.

4	Financial requirement	The total revised project cost will be INR 290.4 lakhs including Operational cost, Fixed Asset cost and EMP cost.
5	Funds for Socio economic development	INR 5.0 lakhs is allocated (@ 2% of the project cost). In addition, any demand raised by people during public hearing will also be met.

1.1.5 DESCRIPTION OF LEASE AREA

The baseline data collection for meteorology, air, water, noise and soil environments have been carried out during Post Monsoon Season (October 2023 to December 2023). Air, water, noise and soil samples are collected and analyzed through NABL accredited lab. The features in the study area are given below.

<table>
<tr><th>S.No.</th><th>Areas</th><th>Distance from project site</th></tr>
<tr><td>1</td><td>Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value</td><td>Nil within 15km radius</td></tr>
<tr><td>2</td><td colspan="2">Areas which are important or sensitive for ecological reasons</td></tr>
<tr><td>A</td><td>Wetlands, water courses or other water bodies,</td><td>
<table>
<tr><th>Water bodies</th><th>Distance</th><th>Direction</th></tr>
<tr><td>Odiyathur lake</td><td>1.02 kms</td><td>N</td></tr>
<tr><td>Chinna Eri</td><td>2.65 kms</td><td>W</td></tr>
<tr><td>Periya Eri</td><td>2.0 kms</td><td>NW</td></tr>
<tr><td>Narayanaburam lake</td><td>3.90km</td><td>NE</td></tr>
<tr><td>Nallurpet lake</td><td>13.53km</td><td>NW</td></tr>
<tr><td>Mel Kavanur lake</td><td>10.26km</td><td>NE</td></tr>
<tr><td>Vasanthanadai lake</td><td>8.20km</td><td>NE</td></tr>
<tr><td>Sathiyamangalam Eri</td><td>10.80 km</td><td>NE</td></tr>
<tr><td>Poigai pond</td><td>14.35km</td><td>NE</td></tr>
<tr><td>Pallikonda Lake</td><td>5.73km</td><td>N</td></tr>
<tr><td>Agaram Aru</td><td>4.30km</td><td>NW</td></tr>
<tr><td>Palar</td><td>7.44km</td><td>N</td></tr>
<tr><td>Bahuda River</td><td>7.50km</td><td>N</td></tr>
</table>
</td></tr>
<tr><td>B</td><td>Coastal zone, biospheres</td><td>Nil within 10km radius</td></tr>
<tr><td>C</td><td>Mountains, forests, Sanctuary</td><td>
<table>
<tr><th>Forest</th><th>Distance</th><th>Direction</th></tr>
<tr><td>Pallikonda RF</td><td>2.23km</td><td>N</td></tr>
</table>
</td></tr>
</table>

		Nallimalai RF	2.47km	E
		Paravamalai RF	2.37km	S
		Sanankupppam RF	6.37km	SW
		Arasampattu RF	5.41km	SE
		Pudukuppam RF	10.41km	S
		Puthur RF	14.66km	S
		Karuthamalai RF	11.92km	SW
		Thellai RF	12.55km	SE
		Athiyur RF	12.31km	E
		Kailasagira RF	13.49km	E
		Koundinya Wildlife Sanctuary	19.60km	NW
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	Defense installations	Nil within 15km radius		
8	Densely populated or built-up area	Odiyathur (2.26 Km -N)		
9	Areas occupied by sensitive man-made land uses (hospitals, schools, places of worship, community facilities)	Odiyathur (2.26 Km -N)		
10	Areas containing important, high quality or scarce resources (ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)	Nil		
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.

1.1.6 DESCRIPTION OF THE ENVIRONMENT

1.1.7 AIR ENVIRONMENT

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

Details of Ambient Air Quality Monitoring Locations				
S. No.	**Station Code**	**Locations**	**Distance & Direction**	**Coordinates**
1	AAQ1	Within Mine Lease area	Core Zone	12°50'40.55"N 78°56'09.12"E
2	AAQ2	Thangal	0.64 km, N	12°51'04.18"N 78°56'17.48"E
3	AAQ3	Pichanatham	1.38 km, SE	12°50'2.02"N 78°56'36.06"E
4	AAQ4	Karadikudi	1.02 km, W	12°50'39.03"N 78°55'31.26"E
5	AAQ5	Odiyathur	2.65 km, NW	12°52'7.05"N 78°55'39.56"E
6	AAQ6	Anaicut	5.92 km, NE	12°52'36.81"N 78°59'14.06"E

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

Results of Air Sampling Analysis in 6 locations			
Station ID	**Min**	**Max**	**Avg.**
Particulate matter PM_{10} ($\mu g/m^3$)			
AAQ-1	52.6	64.7	58.65
AAQ-2	46.1	56.2	51.15
AAQ-3	41.1	52.5	46.8
AAQ-4	44.6	59.2	51.9
AAQ-5	45.2	59.3	52.25
AAQ-6	44.4	55.2	49.8
CPCB NAAQS 2009 for PM_{10} - 100 $\mu g/m^3$			
Particulate matter $PM_{2.5}$ ($\mu g/m^3$)			
AAQ-1	24.1	30.5	27.3
AAQ-2	20.9	27.1	24
AAQ-3	18.7	28.1	23.4
AAQ-4	21.1	29.7	25.4
AAQ-5	20.8	27.1	23.95
AAQ-6	20.2	24.8	22.5
CPCB NAAQS 2009 for $PM_{2.5}$ - 60 $\mu g/m^3$			
Sulphur Di-oxide as SO_2 ($\mu g/m^3$)			
AAQ-1	4.1	6.4	5.25
AAQ-2	4.1	6.8	5.45
AAQ-3	4.0	6.4	5.2
AAQ-4	4.2	8.8	6.5
AAQ-5	4.4	7.8	6.1
AAQ-6	4.1	6.5	5.3
CPCB NAAQS 2009 for SO_2 – 80 $\mu g/m^3$			
Oxide of Nitrogen as NO_2 ($\mu g/m^3$)			
AAQ-1	8.7	11.2	9.95
AAQ-2	7.3	9.1	8.2
AAQ-3	6.2	8.4	7.3
AAQ-4	8.2	12.5	10.35
AAQ-5	7.7	10.2	8.95
AAQ-6	6.4	9.5	7.95
CPCB NAAQS 2009 for NO_2 – 80 $\mu g/m^3$			

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

1.1.8 WATER ENVIRONMENT

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

Results of Surface Water Analysis						
Sr.No	**Parameter**	**Unit**	**SW1**	**SW2**	**SW3**	**Surface water standards (IS: 2296 –Class A)**
1	pH	-	8.01	8.08	7.41	6.5-8.5
2	EC	µs/cm	1042	1251	511.2	-
3	Turbidity	NTU	<1.0	<1.0	110	1
4	Temperature	-	30.5	31	30.5	-
5	Odour	mg/l	Agreeable	Agreeable	Agreeable	500
6	Total Hardness	mg/l	312	320	190	-
7	Calcium Hardness	mg/l	171	175	130	
8	Magnesium Hardness	mg/l	141	145	59.5	-
9	Calcium	mg/l	68.4	69.9	52.1	300
10	Magnesium	mg/l	33.9	34.8	14.3	-
11	Total Alkalnity	mg/l	372	396	141	-
12	Chloride	mg/l	163	192	51.2	-
13	Sulphate	mg/l	54.7	109	65.8	400
14	Mangenese	mg/l	BDL(DL-0.05)	BDL(DL-0.05)	BDL(DL-0.05)	0.5
15	Iron	mg/l	0.03	0.06	0.08	1.0
16	Nitrate	mg/l	2.35	1.25	2.68	20
17	Fluoride	mg/l	0.662162162	0.706306306	0.4875	1.5
18	TDS	mg/l	630	755	326	500
19	FRC	mg/l	BDL(DL-0.2)	BDL(DL-0.2)	BDL(DL-0.2)	250
20	TSS	mg/l	14.0	24.0	56.0	-
21	COD	mg/l	BDL(DL-4.0)	BDL(DL-4.0)	BDL(DL-4.0)	-
22	BOD	mg/l	BDL(DL-2.0)	BDL(DL-2.0)	BDL(DL-2.0)	-
23	DO	mg/l	6.5	6.2	5.9	-

Results of Ground Water sampling Analysis									
S. No	Parameter	GW1	GW2	GW3	GW4	GW5	GW6	Specification/Limit (As per IS:10500 2012)	
								Desirable	Permissible
1	pH	7.61	6.78	7.38	7.74	7.61	7.32	6.5 - 8.5	No Relaxation
2	EC	820.2	1176	1398	2068	1336	2276	1	5
3	Turbidity	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	Agreeable	Agreeable
4	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Total hardness	242	376	413	446	424	577	1	15
6	Calcium hardness	156	298	316	260	242	376	-	-
7	Magnesium hardness	85.6	78.1	96.7	186	182	201	-	-
8	Calcium	62.5	119	126	104	96.7	150	200	600
9	Magnesium	20.5	18.7	23.2	44.6	43.7	48.2	75	200
10	Total Alkalnity	212	341	318	396	412	498		
11	Chloride	143	222	256	315	158	483		
12	Sulphate	64.8	137	199	315	235	203	250	1000
13	Mangenese	BDL (DL-0.05)	BDL (DL-0.05)	BDL (DL-0.05)	BDL (DL-0.05)	BDL (DL-0.05)	BDL (DL-0.05)	30	100
14	Iron	0.06	0.06	0.12	0.03	0.00	0.04	45	No Relaxation
15	Nitrate	3.24	2.98	3.44	2.61	1.87	2.65	200	400
16	Fluoride	0.55	0.19	0.57	0.56	0.62	0.69	1	No Relaxation
17	TDS	495	730	854	1262	844	1370	0.1	0.3
18	FRC	BDL(DL-0.2)	BDL(DL-0.2)	BDL(DL-0.2)	BDL(DL-0.2)	BDL(DL-0.2)	BDL(DL-0.2)	Not Specified	Not Specified

All the values were found to be within permissible limits

1.1.9 NOISE ENVIRONMENT

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

Noise monitoring Results						
S. No	Location	Day equivalent (dB)	Night equivalent (dB)	Permissible noise level standards by CPCB		Zone
				Day time (dB)	Night time (dB)	
1	Within Mine Lease area	44.6	37.3	75	70	Industrial Zone
2	Thangal	46.9	37.7	55	45	Residential Zone
3	Pichanatham	45.8	38.6			
4	Karadikudi	44.8	37.1			
5	Odiyathur	48.3	38.3			
6	Anaicut	47.5	38.3			

All the values are found to be within CPCB norms.

1.1.10 SOIL ENVIRONMENT

Soil samples are collected from 3 locations and the results are given below.

Results of Soil Sample Analysis				
S.No	Parameter	S1	S2	S3
1	pH	8.21	7.52	7.94
2	EC	87.21	64.83	109.20
3	Dry matter	90.86	95.11	91.62
4	Water content	9.14	4.89	8.38
5	Organic matter	0.12	0.15	0.21
6	Soil texture	Silty Clay Loam	Silty Clay	Clay
7	Total soluble Sulphates %	BDL(DL-0.02)	BDL(DL-0.02)	BDL(DL-0.02)
8	Grain Size Distribution			
	Sand %	8.60	5.41	5.16
	Silt %	54.20	49.39	37.06
	Clay %	37.20	45.21	57.78
9	Nitrogen & nitrogenous compounds mg/kg	154	192	177
10	Phosphorus mg/kg	0.14	0.14	0.14
11	Sodium mg/kg	1015	825	793
12	Potassium mg/kg	515	339	384
13	Water holding capacity	4.2	3.9	4.7
14	Porosity	19.5	18.4	17.2

1.1.11 BIOLOGICAL ENVIRONMENT

Flora

For measuring the extent of flora present in the study area, the area is divided in to 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, 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.

1.1.12 LAND USE

The land use land cover data is found using the Geo EYE satellite imagery. The number of bands used are 10. The land use classification is given below:

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 habitation	20.14	6.15	Residential	20.14	6.15
				Commercial/Industrial		
2	Agriculture	151.03	46.12	Crop/fallow land	151.03	46.12
				Plantation		
3	Forest	137.23	41.90	Forest	137.23	41.90
4	Water bodies	15.75	4.81	Reservoir/Lake /Pond	6.8	2.08
				River/Stream	8.95	2.73
5	Waste Land	2.79	0.85	Open without scrub	1.23	0.38
				Open with scrub	1.56	0.48
6	Mines	0.56	0.17	Mines	0.56	0.17
Total		**327.5**	**100**		**327.5**	**100**

1.1.13 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.

The expert visited 5 villages in the study area namely Thangal, Pichanatham, Karadikudi, Odiyathur and Anaicut 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 Balwadis/Anganwadis. The following observations were made.

Primary schools are available in many villages. For hospital facilities, people in the locality have to go to hospital in Anaicut which is about 6.73 Km -NE from the lease area. Major schools with higher secondary and senior secondary schools are located in Anaicut. The major Panchayat Union located in the area is in Vellore. Facilities like petrol pump stations, ATM facility are available in Anaicut.

1.1.14 HYDROGEOLOGY OF THE LEASE AREA

The hydrological and hydrogeological pattern of the study area is studied in detail using satellite imagery. Within 10km radius from the proposed site, there is Periya Eri which is located at a distance of 2.00 km in Northwest direction, Agaram Aru is located at a distance of 4.30 km in Northwest direction, Palar River is located at a distance of 7.44 km in Northern direction and Bahuda River is located at a distance of 7.50 km in Northern direction respectively. The water is temporarily found only during the rainy season.

In this representation in the two seasons, the water level substantially gets fall-down in the non-monsoon season, because of the rainfall impact and it extended up to the Monsoon season.

In the study area, the shallow aquifer is developed through dug wells and deeper aquifer through tube wells. The study has revealed that potential fractures are encountered at deeper levels.

Rain water collected in the tanks in the region acts as a good source of water during monsoon season. In order to increase the recharge, tanks, and percolation ponds may be provided with the recharge wells/recharge shafts penetrating this impervious layer to make it more effective in recharging the aquifer.

1.2 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental impacts on the following environments are identified.

- Land environment
- Water environment
- Biological Environment
- Air environment
- Noise environment
- Socio Economic Environment

1.2.1 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 32m (17m Above Ground Level and 15m Below Ground level for the period of five years). 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, 1.50.20 Ha of lease area will be left as rain water harvesting pond, 0.20.0 Ha will be developed with green belt. For this, plants like Pungai, Vagai, Vembu, Manjal konrai, Naval, Puvarasu, etc., are selected. A total of 240 trees are planned to be planted inside the lease area with spacing of 3m x 3m.

1.2.2 WATER ENVIRONMENT: IMPACT AND MITIGATION MEASURES

- There is no seasonal or perennial Odai within the M.L area. From the proposed site, Periya Eri is located at a distance of 2.00 km in Northwest direction, Agaram Aru is located at a distance of 4.30 km in Northwest direction, Palar River is located at a distance of 7.44 km in Northern direction and Bahuda River is located at a distance of 7.50 km in Northern direction respectively.
- 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. The project proponent will restrict the mining operation only within the lease and no other work will be carried out outside the mining lease.
- Rain water will be diverted into working area by constructing drains to store and use for dust suppression and greenbelt development. The total water required for this project will be 2.0 KLD and negligible sewage of 0.8 KLD will be generated, for which a septic tank with soak pit will be set up. In initial stage, water will be sourced from outside agencies, later the rainwater collected in the mine pit sump will be used for this purpose.
- The mining activity is not likely to intersect ground water as the ground water table occurs at a depth of 50m BGL in summer season. The mining will go up to the maximum depth of 32m (17m AGL and 15m BGL).

1.2.3 BIOLOGICAL ENVIRONMENT: IMPACT & MITIGATION MEASURES

- The mine lease area is devoid of major plantation. Shrubs and bushes are majorly found within the lease area. The proponent has planned to develop Green belt/Plantation by planting 1,160 Saplings. Out of this, 240 saplings will be planted in the safety zone area of 0.20 Ha for the period of 5 year and remaining 920 saplings will be planted outside the lease area such as at project surrounding schools, temples, road sides, etc.
- 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.
- To prevent entry of animals, the mining area will be properly fenced.

1.2.4 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 Ground Level Concentrations for study period computed using AERMOD model and are plotted as isopleths in which represents the spatial distribution of the Predicted Ground Level Concentrations of $PM_{2.5}$ & PM_{10} due to emissions from mine.
- 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 49.18 $\mu g/m^3$ to 61.83 $\mu g/m^3$ and for $PM_{2.5}$ are in the range of 22.60 $\mu g/m^3$ to 27.91 $\mu g/m^3$; whereas the cluster concentrations values for PM_{10} are in the range of 50.47

$\mu g/m^3$ to 64.01 $\mu g/m^3$ and for $PM_{2.5}$ are in the range of 22.72 $\mu g/m^3$ to 27.97 $\mu g/m^3$ which are within the statutory limits in each case.

1.2.5 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.

1.2.6 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.

1.2.7 SOCIO ECONOMIC ENVIRONMENT: IMPACT AND MITIGATION MEASURES

The lease area is Patta land registered in the name of applicant vide patta no. 757 & 943. No rehabilitation is needed. Hence, there is no negative impact. The proponent has planned to spend INR 5,00,000/- Lakhs @ 2% of the project cost for CER activities. This amount will be subjected to change after public hearing.

1.2.8 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.

1.3 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.
- At last, the revised total EMP Cost is 217.01 Lakhs for a period of five years have been proposed. i.e., Capital cost of Rs. 60.25 Lakhs + Recurring cost of Rs. 156.76 lakhs (For Five years).

1.4 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 24 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.

1.5 CONCULSION

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 INR 156.76 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.

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ANNEXURE-1

Rc.No.71/2022(Mines) Date : 28.12.2022

O/o. The Assistant Director
Department of Geology and Mining
Collectorate,
Vellore District.

PRECISE AREA COMMUNICATION LETTER

Sub: Mines and Minerals – Minor Mineral – Vellore District – Anaicut Taluk – Karadikudi Village – SF.Nos.253/7, 259/5, 259/2 & 259/4 – Extent of 2.31.50 of patta lands – Quarry lease application preferred by Thiru.R.Natarajan for Quarrying Roughstone and Gravel – Recommendations received – Precise Area Communicated – Reg.

Ref: 1) Quarry lease application preferred by Thiru.R.Natarajan, dated: 13.05.2022.

2) The Revenue Divisional Officer, Vellore report Rc.No.A4/2576/2022 dated: 16.07.2022.

3) Inspection report of the Assistant Director of Geology and Mining, Vellore dated: 16.11.2022.

4) G.O.(MS)No.169 Industries(MMC.1) Department, dated 04.08.2020.

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One Thiru.R.Natarajan S/o.Rangasamy, No.147, Ayyagoundarpatti, Kollamangalam Village, Gudiyatham Taluk, Vellore District applied for grant of lease for quarrying Roughstone and Gravel over an extent of 2.31.50 hectares of patta lands in SF.Nos.253/7, 259/5, 259/2 & 259/4 of Karadikudi Village, Anaicut Taluk, Vellore District for a period of 5 years under Rule 19 & 20 of Tamil Nadu Minor Mineral Concession Rules, 1959.

2) The Revenue Divisional Officer, Vellore has recommended for grant of quarry lease in the subject area and the Assistant Director, Geology and Mining, Vellore has also recommended for grant of quarry lease for quarrying rough stone and gravel over an extent of 2.31.50 hectares of patta lands in SF.Nos.253/7, 259/5, 259/2 & 259/4 of Karadikudi Village, Anaicut Taluk, Vellore District subject to certain conditions.

In view of the above, based on the recommendations of the Revenue Divisional Officer, Vellore and Geological field observations of the Assistant Director of Geology and Mining, an extent of 2.31.50 hectars of patta land in SF.Nos.253/7, 259/5, 259/2 & 259/4 of Karadikudi Village, Anaicut Taluk, Vellore District is hereby fixed as precise area and communicated to the applicant as per the powers conferred under Rule 41(4) of Tamil Nadu Minor Mineral Concession Rule as amended vide G.O.169 Industries (MS) Department, dated 04.08.2020 for grant of lease for quarrying Roughstone & Gravel in favour of Thiru.R.Natarajan for a period of 5 years under Rule 19 & 20 of Tamil Nadu Minor Mineral Concession Rules, 1959 subject to the following conditions.

Conditions

1. 7.5 meters safety distance should be left out for the adjacent patta lands.
2. 10 meters safety distance should be left out for the adjacent Government Poramboke lands.
3. The applicant shall not make any hindrance to the adjacent lands and public.
4. Quarrying should be restricted in the lease granted area only and barbed wire fencing should be erected all along the boundary of the lease granted area before commencement of quarrying operation.
5. Blasting of rock should be done by the short fire method with less explosives in between 12.00 Noon to 2.00 P.M., after giving Proper signal by siren as per the provisions of Indian Explosives Act, 1884.
6. Quarrying should be carried out in scientific and systematic manner.

The applicant Thiru.R.Natarajan is directed to submit the Mining plan within 90 days to the Assistant Director of Geology and Mining, Vellore for approval and also to submit Environmental Clearance issued by State Environmental Impact Assessment Authority (SEIAA) as required under Rule 41 & 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 for the above area for further process.

23/12/22

Assistant Director,
Geology and mining,
Vellore.

To:

Thiru.R.Natarajan,
S/o.Rangasamy,
No.147, Ayyagoundarpatti,
Kollamangalam Village,
Gudiyatham Taluk,
Vellore District.

23/12/22

Copy to

1.The Chairman,
SEIAA,3rd Floor, Panagal Maaligai,
No.1, Jeenis Road, Saidapet,
Chennai-15.

2.The Commissioner of
Geology and Mining,
Guindy, Chennai-32.

ANNEXURE-2

From

Thiru D.Bernard. M.Sc.,
Assistant Director,
Dept.of Geology and Mining,
Vellore District.

To

Thiru.R.Natarajan,
S/o.Rangasamy,
No.147, Ayyagoundarpatti,
Kollamangalam Village,
Gudiyatham Taluk,
Vellore District.

Rc.No.71/2022(Mines) Dated: 13 .01.2023

Sir,

Sub: Mines and Minerals – Minor Minerals – Roughstone and Gravel – Vellore District - Anaicut Taluk - Karadikudi Village - SF.Nos.253/7, 259/5, 259/2 and 259/4 – OAE of 2.31.50 Hect – Quarry lease application preferred by Thiru.R.Natarajan - Precise area communicated - Draft Mining plan submitted - Approved – Regarding.

Ref: 1. Application of Thiru.R.Natarajan dated: 13.05.2022.

2. This office Precise area communication letter Rc.No. 71/2022 (Mines) dated 28.12.2022.

3. The applicant letter dated 18.01.2023.

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In the reference first cited, Thiru.R.Natarajan S/o.Rangasamy, No.147, Ayyagoundarpatti, Kollamangalam Village, Gudiyatham Taluk, Vellore District has applied for grant of quarry lease for quarrying 'Rough stone & Gravel' over an extent 2.31.50 Hects of patta land in SF.Nos.253/7, 259/5, 259/2 & 259/4 of Karadikudi Village, Anaicut Taluk, Vellore District under the provisions of Rule 19 & 20 of Tamil Nadu Minor Mineral Concession Rules, 1959.

2) In the reference letter second cited, the Assistant Director, Geology and Mining, Vellore has communicated "Precise Area" for the proposal based on the recommendations of the Revenue Divisional Officer, Vellore field observation under Rule 41 of Tamil Nadu Minor Mineral Concession Rules, 1959 with the direction to the applicant to submit approved Mining plan and Environmental Clearance.

3) In the reference third cited, the applicant has submitted three copies of draft Mining plan prepared by the qualified person for approval. The draft Mining plan has been examined and verified with reference to the provisions laid down in Rule 36 and 41 of Tamil Nadu Minor Mineral concession Rules and the guidelines issued by the Commission of Geology and Mining vide letter Rc.No. 3868/LC/2012 dated. 19.11.2012 & 07.11.2014.

4) **The scrutiny remarks on the draft Mining Plan are furnished below.**

a. The Rough Stone & Gravel quarry has been planned to be operated for a period of five years.

b. The Geological reserve in the subject area is assessed as 5,35,500 cubic meter of Rough Stone and 50,134 cubic meter of Gravel.

c. The Mineable reserve is computed as 2,08,760 cubic meter of Rough Stone and 34,184 cubic meter of Gravel upto a depth of 32 m (17m above ground level and 15 m below ground level).

d. Machineries like tractor mounted compressor attached with jack hammers, excavators are proposed for quarrying operation.

e. Water table level in the area applied is in between 50m and 47m during a year.

f. As per the Rule 111 of Metelliferous Mining Regulations 1961, the boundary barrier Zone of 7.5 meters is ear-marked as neutral zone.

g. The plates including Satellite image (1:10,000), Toposketch of quarry lease applied area for 10Km Radius (1:1,00,000), Quarry lease & Surface plan (1:1,000), Conceptual plan and sections (1:1000) & Sections Hor–(1:1000) Ver–(1:500) Topography, Geological & year wise development & production plan & sections (1: 1000) & Sections Hor–(1:1000) Ver–(1:500) and Environmental plan (1:10,000) were verified with reference to the field evidences.

h. The stipulations made in rule 36 of the Tamil Nadu Minor Mineral Concession Rules, 1959 are adhered in the draft Mining plan.

i. The draft Mining plan is submitted within the prescribed time limit of 90 days from the date of receipt of the precise area communication letter.

In view of the above, as per the powers laid down in rule 41 of the Tamil Nadu Minor Mineral Concession Rules, 1959, the draft mining plan submitted by the applicant Thiru.R.Natarajan S/o.Rangasamy, No.147, Ayya-goundarpatti, Kollamangalam Village, Gudiyatham Taluk, Vellore District in respect of proposed Rough Stone & Gravel quarry (Minor Mineral) over an extent 2.31.50 Hects patta land in SF.Nos.253/7, 259/5, 259/2 & 259/4 of Karadikudi Village, Anaicut Taluk, Vellore District is hereby approved subject to the following conditions and stipulations made in the governing Act and Rules.

The Mining plan is approved without prejudice to any other Law applicable to the quarry lease from time to time.

i) 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 Tamil Nadu Minor Mineral Concession Rules, 1959.

ii) The Mining plan is approved without prejudice to any of the orders or directions from any legal forums.

iii) Quarrying shall be carried out scrupulously as per the Approved Mining plan.

Encl: 2 copies of Approved Mining Plan.

12/01/23

Assistant Director,
Geology and Mining,
Vellore.

Copy submitted to:

The Chairman,
State Level Environment Impact
Assessment Authority,
3rd Floor, Panagal Maaligai,
No.1 Jeenis Road, Saidapet,
Chennai-15.

13/1/23

ANNEXURE-3

From

Thiru.D.Bernard. M.Sc.,
Assistant Director,
Geology and Mining,
Vellore District.

To

Thiru.R.Natarajan
S/o.Rangasamy
147, Kollamangalam Village,
Gudiyatham Taluk,
Vellore District.

Rc.No.72/2022 (Mines) Date 13 .01.2023

Sir,

Sub: Mines and Minerals – Minor Mineral – Vellore District – Anaicut Taluk – Karadikudi Village – SF.Nos.253/7, 259/5, 259/2 & 259/4 – over an extent of 2.31.50 hectares of patta land–Quarry lease application preferred by Thiru.R.Natarajan S/o.Rangasamy - Precise area communicated - Draft Mining plan submitted– Approved – Certificate requested - Regarding.

Ref: 1. Application of Thiru.R.Natarajan dated 13.05.2022.
2. The applicant letter dated 13.01.2023.

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In the reference first cited, Thiru.R.Natarajan S/o.Rangasamy, No.147 Ayyagoundarpatti, Kollamangalam Village, Gudiyatham Taluk, Vellore District applied for grant of lease for quarrying Rough stone and Gravel over an extent of 2.31.50 hectares of patta land in SF.Nos.253/7, 259/5, 259/2 & 259/4 of Karadikudi Village, Anaicut Taluk, Vellore District for a period of 5 years under Rule 19 & 20 of Tamil Nadu Minor Mineral Concession Rules, 1959.

In this reference 2nd cited Thiru.R.Natarajan S/o.Rangasamy applicant of the proposed stone quarry has requested to furnish the details of existing, abandoned and proposed quarries situated within 500mts radius from the subject quarry.

Accordingly, the above details are furnished below.

1) Existing Quarries :

Sl. No.	Name of the Lessee / Permit Holder	Village & Taluk	S.F. No.	Extent in hects,	Lease Period
1.	S.Sumathi	Anaicut Karadikudi	252/5	1.29.5	15.03.2018 To 14.03.2023
2.	C.Venkatesan	Anaicut Karadikudi	147/11	1.10.0	18.04.2018 To 17.04.2023

3.	D.Sivakumar	Anaicut Karadikudi	258/8	0.33.5	11.02.2019 To 10.02.2024
4.	T.Balachandar	Anaicut Karadikudi	253/6	0.44.0	05.07.2021 To 04.07.2026

2) Expired Quarries :

Sl. No.	Name of the Lessee / Permit Holder	Village & Taluk	S.F. No.	Extent in hect,	Lease Period
1.	D.Sivakumar	Anaicut Karadikudi	425/11	1.24.5	20.10.2014 To 19.10.20219
2.	R.Natarajan	Anaicut Karadikudi	254/4	0.34.0	10.05.2017 To 09.05.2022

3) Abandoned Quarries :

Sl. No.	Name of the Lessee / Permit Holder	Village & Taluk	S.F.No.	Extent in hect,	Remarks
1.	K.Giridharan	Anaicut Karadikudi	242/2,4, 8 & 6A	1.36.0	07.06.2010 To 06.06.2015
2.	R.Natarajan	Anaicut Karadikudi	246/1, 251/3A, 253/4	2.69.0	18.07.2011 To 17.07.2016

4) Present Proposed Quarries :

Sl. No	Name of the Lessee /Permit Holder	Village & Taluk	S.F. No.	Extent in hects,	Lease Period
1.	K.Munisamy	Anaicut Karadikudi	255/2,7 & 358/2	2.15.5	-
2.	R.Natarajan	Anaicut Karadikudi	251/3A	1.05.5	-
3.	R.Natarajan	Anaicut Karadikudi	253/7, 259/2,4 & 5	2.31.5	-
4.	Tmt.Kasthuri	Anaicut Karadikudi	253/4	1.64.0	-

13/01/25

Assistant Director,
Geology and Mining,
Vellore District.

13/1/25