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. TN/F.No.9924/SEAC/1(a)ToR-1479/2023, dated 22.06.2023

PROPOSED QUARRY LEASE DETAILS	
SURVEY NO	251/3A
VILLAGE	KARADIKUDI
TALUK	ANAICUT
DISTRICT	VELLORE
EXTENT	1.05.5 HA
PROPOSED PRODUCTION QUANTITY (FIVE YEARS)	ROUGH STONE: 74,260 m^3 GRAVEL: 7,752 m^3 ULTIMATE DEPTH: 42m(22m AGL and 20m BGL) RESTRICTED DEPTH: 37m
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 2023 to December 2023

APPLICANT

THIRU.R. NATARAJAN

S/O. RANGASAMY

NO.147, KOLLAMANGALAM VILLAGE

GUDIYATHAM TALUK, VELLORE-DISTRICT

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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SEPTEMBER- 2024

NABET

EXECUTIVE SUMMARY

1.1 OVER ALL JUSTIFICATION FOR IMPLEMENTATION OF THE PROJECT

INTRODUCTION

Thiru.R.Natarajan S/o. Rangasamy has obtained Precise Area Communication Letter from Assistant Director, Department of Geology and Mining, Vellore to quarry out 74,260 m^3 of Rough Stone and 7752 m^3 of Gravel. Over an extent of 1.05.5 Ha., located at the Survey No. 251/3A of Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu Stat.

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.9924/SEAC/1(a)ToR-1479/2023, dated 22.06.2023. This report has been prepared in line with the approved TOR for production of maximum excavation of 74,260 m^3 of Rough Stone and 7752 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 a Patta land attached as **Annexure 6.**

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	1.05.5 Ha
6.	Proposed depth of mining & Ultimate depth	42m (22m Above Ground Level and 20m Below Ground level for the period of five years) & restricted depth of 37m
7.	Method of mining	Opencast-Semi-Mechanized
8.	Proposed lease period	5 Years

9.	Proposed Environmental Clearance	5 Years
10.	Proposed production quantity for five years	Rough Stone: 74,260 m3 Gravel: 7752 m3

LOCATION

This project site is located in Karadikudi Village, Anaicut Taluk, Vellore District, Tamil Nadu State with Latitude 12° 50’ 31.73" N to 12° 50’ 34.79" Nand Longitude: 78° 56’ 10.08" E to 78° 56’ 14.43" 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 Pre Winter season 2024 (October 2023 to December 2023)

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.

PROJECT DESCRIPTION

This is a proposed Rough Stone and Gravel quarry by Opencast-Semi-Mechanized mining method with drilling and blasting. The quarrying is restricted up to a depth of 42m(22m Above Ground Level and 20m Below Ground level). The geological reserves are estimated to be 3,18,040 m3 of Rough Stone and 11046 m3 of Gravel. The mineable reserve calculated by deducting 7.5 m safety distance and bench loss. The mineable reserves are 74,260 m3 of Rough Stone and 7752 m3 of Gravel which will be recovered at the rate of 100% recovery upto a depth of 42m (22m Above Ground Level and 20m Below Ground level for the period of five years) & restricted depth of 37m.

- It is proposed to quarry out rough stone and Gravel 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 and Gravel.
- There is no overburden anticipated during entire rough stone and Gravel quarrying operation.

Salient features of the project		
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 - 74,260 m3 Gravel - 7752 m3
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 9 Nos (1+8).
9	Proposed depth of mining & Ultimate depth	42m (22m Above Ground Level and 20m Below Ground level for the period of five years) & restricted depth of 37m
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.

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. 0.5 KLD drinking water requirement, green belt

		development is 1.0 KLD and dust suppression is 0.5 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 – 10, temporary employees – 11
4	Financial requirement	The total project cost as per PFR will be INR 50,33,000 lakhs including Operational cost, Fixed Asset cost and EMP cost
5	Funds for Socio economic development	INR 100660 is allocated. In addition, any demand raised by people during public hearing will also be met.

DESCRIPTION OF LEASE AREA

The features in the study area are given below.

The baseline data collection for meteorology, air, water, noise and soil environments have been carried out during Pre Winter season 2024 (October 2023 to December 2023).

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

Table 11.1 Description of the lease area

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**
		Odiyathur lake	1.62 kms	NNW
		Periya Eri	2.82 kms	NW
		Chinna Eri	3.06 kms	W

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<tr><td>Kilkrishnapuram lake</td><td>3.46km</td><td>NW</td></tr>
<tr><td>Narayanaburam lake</td><td>3.90km</td><td>NE</td></tr>
<tr><td>Pallikonda Lake</td><td>5.73km</td><td>N</td></tr>
<tr><td>Katteri Lake</td><td>8.34km</td><td>NE</td></tr>
<tr><td>Mel Kavanur lake</td><td>11.11km</td><td>NNE</td></tr>
<tr><td>Sathiyamangalam Eri</td><td>11.45 km</td><td>NE</td></tr>
<tr><td>Valathur lake</td><td>12.42km</td><td>NW</td></tr>
<tr><td>Robinson lake</td><td>13.25km</td><td>NW</td></tr>
<tr><td>Nallurpet lake</td><td>13.53km</td><td>NW</td></tr>
<tr><td>Nattarmangalam Lake</td><td>14.01km</td><td>NE</td></tr>
<tr><td>Vasanthanadai lake-</td><td>8.75km</td><td>NE</td></tr>
<tr><td>Poigai pond</td><td>14.59km</td><td>NE</td></tr>
<tr><td>Periya River</td><td>0.46km</td><td>SW</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>7.96km</td><td>N</td></tr>
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</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</td><td>
<table>
<tr><th>Forest</th><th>Distance</th><th>Direction</th></tr>
<tr><td>Pallikonda RF</td><td>0.82km</td><td>NE</td></tr>
<tr><td>Paravamalai RF</td><td>2.37km</td><td>S</td></tr>
<tr><td>Nallimalai RF</td><td>2.47km</td><td>E</td></tr>
<tr><td>Arasampattu RF</td><td>5.41km</td><td>SE</td></tr>
<tr><td>Appukkal RF</td><td>5.84km</td><td>NE</td></tr>
<tr><td>Sanankupppam RF</td><td>6.37km</td><td>SW</td></tr>
<tr><td>Pudukuppam RF</td><td>10.41km</td><td>S</td></tr>
<tr><td>Karuthamalai RF</td><td>11.92km</td><td>SW</td></tr>
<tr><td>Athiyur RF</td><td>12.31km</td><td>E</td></tr>
<tr><td>Thellai RF</td><td>12.55km</td><td>SE</td></tr>
<tr><td>Kailasagira RF</td><td>13.49km</td><td>E</td></tr>
<tr><td>Kathalampattu RF</td><td>14.26km</td><td>SE</td></tr>
<tr><td>Puthur RF</td><td>14.66km</td><td>S</td></tr>
<tr><td>Kaudinya wildlife sanctuary</td><td>-19.82 km</td><td>NW</td></tr>
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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	Anaicut (6.92 Km -NE)
9	Areas occupied by sensitive man-made land uses (hospitals, schools, places of worship, community facilities)	Anaicut (6.92 Km -NE)
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.

EXPLANATION OF HOW ADVERSE EFFECTS HAVE BEEN MITIGATED

AIR ENVIRONMENT

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

11.2 Details Of Ambient Air Quality Monitoring Locations				
S. No.	**Station Code**	**Locations**	**Distance & Direction**	**Coordinates**
1	AAQ 1	Within Mine Lease area	Core Zone	12°50'31.07"N 78°56'10.45"E
2	AAQ 2	Thangal	1.04 N	12°51'04.18"N 78°56'17.48"E
3	AAQ 3	Pichanatham	1.08 SE	12°50'2.02"N 78°56'36.06"E
4	AAQ 4	Karadikudi	1.12 W	12°50'39.03"N 78°55'31.26"E
5	AAQ 5	Odiyathur	3.09 NW	12°52'7.05"N 78°55'39.56"E
6	AAQ6	Anaicut	6.08 NE	12°52'36.81"N 78°59'14.06"E

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

Station ID	Min	Max	Avg.
AAQ-5	7.7	10.2	8.95
AAQ-6	6.4	9.5	7.95
CPCB NAAQS 2009 for NO_2 – 80 µg/m^3			

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

WATER ENVIRONMENT

Table 11.3 Results of Ground Water sampling Analysis in 6 locations							Specification/ Limit (As per IS:10500: 2012)	
	W1	W2	W3	W4	W5	W6	Desirable	Permissible
pH	7.61	6.78	7.38	7.74	7.61	7.32	6.5 - 8.5	No Relaxation
EC	820.2	1176	1398	2068	1336	2276	1	5
Turbidity	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	Agreeable	Agreeable
Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
T.hardness	242	376	413	446	424	577	1	15
C.hardness	156	298	316	260	242	376	-	-
M.hardness	85.6	78.1	96.7	186	182	201	-	-
Calcium	62.5	119	126	104	96.7	150	200	600
Magnesium	20.5	18.7	23.2	44.6	43.7	48.2	75	200
T.alkalnity	212	341	318	396	412	498		
Chloride	143	222	256	315	158	483		
Sulphate	64.8	137	199	315	235	203	250	1000
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
Iron	0.06	0.06	0.12	0.03	0.00	0.04	45	No Relaxation
Nitrate	3.24	2.98	3.44	2.61	1.87	2.65	200	400
Fluoride	0.55	0.19	0.57	0.56	0.62	0.69	1	No Relaxation
Tds	495	730	854	1262	844	1370	0.1	0.3
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

NOISE ENVIRONMENT

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

Table.11.4 Noise monitoring results

S. No	Location	Day equivalent	Night equivalent	Day equivalent limits by CPCB	Night equivalent limits by CPCB
1	Within Mine Lease area	44.6	37.3	75	70
2	Thangal	46.9	37.7		
3	Pichanatham	45.8	38.6		
4	Karadikudi	44.8	37.1		
5	Odiyathur	48.3	38.3		
6	Anaicut	47.5	38.3		

SOIL ENVIRONMENT

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

Table 11.5 Results of Soil Sample Analysis

S.No	Parameter	S1	S2	S3
1	Ph	8.21	7.52	7.94
2	Ec	87.92	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	Sulphur	BDL(DL-0.2)	BDL(DL-0.2)	BDL(DL-0.2)
7	Soil texture	SILTY CLAY LOAM	SILTY CLAY	CLAY
	Sand%	8.60	5.41	5.16
8	Silt%	54.20	49.39	37.06
9	Clay%	37.20	45.21	57.78
10	Nitrogen & nitrogenous compounds mg/kg	154	192	177
11	Phosphorus mg/kg	0.14	0.14	0.14
12	Sodium mg/kg	1015	825	793
13	Potassium mg/kg	515	339	384
14	Water holding capacity	4.2	3.9	4.7
15	Porosity	19.5	18.4	17.2

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.

11.1.1 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. 11.6: 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/Stram	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**

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 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 Anaicut. 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 6.92 Km -NE from the lease area. Major schools with higher secondary and senior secondary schools are located in Anaicut. The major Anaicut Union located in the area is Vellore. Facilities like petrol pump stations, ATM facility are available in Anaicut.

HYDROGEOLOGY OF THE LEASE AREA

Since There is Periya River is located at a distance of 0.46 km in South west direction, Agaram Aru is located at a distance of 4.30 km in North west direction, Palar is located at a distance of 7.44 km in North direction and Bahuda River is located at a distance of 7.96 km in N direction from the proposed site, the hydrological and hydrogeological pattern of the study area is studied in detail using satellite imagery.

To assess the hydrogeological condition of the surrounding proposed mine lease area. The study area is located in Karadikudi Village, Anaicut Taluk, Vellore District,

Tamilnadu State is considered to understand the nature of the general hydrogeological conditions of the surrounding proposed mine lease area.

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.

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 37m BGL. 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

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 (22m Above Ground Level and 20m 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 0.77.0 Ha of lease area will be left as rain water harvesting pond 0.77.0 Ha will be developed with green belt. For this, plants like Pungai, Vagai, Vembu, Manjal konrai, Naval, Puvarasu, etc are selected. A total of 1000 trees are planned to be planted. Spacing will be 3m x 3m.

WATER ENVIRONMENT: IMPACT AND MITIGATION MEASURES

There is no water body present inside the lease area. The entire water requirement for the project is 2.0 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 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 42m (22m Above Ground Level and 20m Below Ground level for the period of five years), there will not be any seepage. However, the rain water percolation and collection of water from seepage shall be less than 300 lpm 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.

Water bodies	Distance	Direction
Odiyathur lake	1.62 kms	NNW
Periya Eri	2.82 kms	NW
Chinna Eri	3.06 kms	W
Kilkrishnapuram lake	3.46km	NW
Narayanaburam lake	3.90km	NE
Pallikonda Lake	5.73km	N
Katteri Lake	8.34km	NE
Mel Kavanur lake	11.11km	NNE
Sathiyamangalam Eri	11.45 km	NE
Valathur lake	12.42km	NW
Robinson lake	13.25km	NW
Nallurpet lake	13.53km	NW
Nattarmangalam Lake	14.01km	NE
Vasanthanadai lake-	8.75km	NE
Poigai pond	14.59km	NE
Periya River	0.46km	SW
Agaram Aru	4.30km	NW
Palar	7.44km	N
Bahuda River	7.96km	N

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

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.

AIR ENVIRONMENT: IMPACT AND MITIGATION MEASURES

The major air pollutants due to mining operations are fugitive emissions like PM_{10}, $PM_{2.5}$. Other than these pollutants, gaseous emissions of sulfur dioxide (SO_2) and oxides of nitrogen (NO_x) 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 unfavorable 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 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.

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 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 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.
- 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.

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

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 Rs. 100660/- Lakhs @ 2% of the project cost for CER activities. This amount will be subjected to change after public hearing.

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, Rhematic 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.

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. For EMP, a budget of INR 1,06,37,571 Lakhs is allocated.

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 21 people directly. Local people will be hired for unskilled labour.
- Through CSR, nearby schools, hospitals will be benefitted.
- For CSR, INR 100660 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 50,33,000 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.

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ANNEXURE-1

ANNEXURE

Rc.No.303/2019(Mines)

Date : .12.2022

O/o. The Assistant Director(i/c)
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.No.251/3A – over an extent of 1.05.5 hectares of patta land–Quarry lease application preferred by Thiru.Natarajan S/o.Rangasamy for quarrying Rough stone and Gravel-Recommendations received – Precise Area Communicated – Reg.

Ref: 1) G.O.(MS)No.169Industries(MMC.1)Department, dt 04.8.2020.
2) Quarry lease application preferred by Thiru.R.Natarajan S/o.Rangasamy dated: 09.09.2019.
3) The Revenue Divisional Officer, Anaicut report Rc.No.A4/ 4047/2022, Dated: 16.07.2022.
4) Inspection report of the Assistant Director, Geology and Mining, Vellore dated 16.11.2022.

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One Thiru.R.Natarajan S/o.Rangasamy, No.147, Kollamangalam Village, Gudiyatham Taluk, Vellore District applied for grant of lease for quarrying Rough stone and Gravel over an extent of 1.05.5 hectares of patta land in SF.No. 251/3A 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 and the Assistant Director, Geology and Mining, Vellore have recommended for grant of quarry lease for quarrying rough stone and gravel over an extent of 1.05.5 hectares of patta lands in SF.No.251/3A 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, Geology and Mining, an extent of 1.05.5 hectars of patta land in SF.No. 251/3A 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 Rough stone & Gravel in favour of Thiru.R.Natarajan S/o. Rangasamy 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. 7.5meters 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 S/o.Rangasamy 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.

26/12/22

Assistant Director,
Geology and mining
Vellore

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

26/12/22

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.303/2019(Mines) Dated: .01.2023

Sir,

Sub: Mines and Minerals – Minor Minerals – Roughstone and Gravel – Vellore District - Anaicut Taluk - Karadikudi Village - SF.No.251/3A – OAE of 1.05.5 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: 09.09.2019.

2. This office Precise area communication letter Rc.No. 303/2019 (Mines) dated 26.12.2022.

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 1.05.5 Hects of patta land in SF.No.251/3A 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 3,18,040 cubic meter of Rough Stone and 11,046 cubic meter of Gravel.

c. The Mineable reserve is computed as 74,260 cubic meter of Rough Stone and 7,752 cubic meter of Gravel upto a depth of 42 m (22m above ground level and 20 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 1.05.5 Hects patta land in SF.No.251/3A 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

13/11/23

Assistant Director,
Geology and Mining,
Vellore.

Copy submitted to:

13/11/23

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

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.303/2019 (Mines) Date 13 .01.2023

Sir,

Sub: Mines and Minerals – Minor Mineral – Vellore District – Anaicut Taluk – Karadikudi Village – SF.No.251/3A – over an extent of 1.05.5 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 09.09.2019.

2. The applicant letter dated 13.01.2023.

****

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 1.05.5 hectares of patta land in SF.No.251/3A 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	-

13/01/23

Assistant Director,
Geology and Mining,
Vellore District.

13/1/23