

Executive Summary

For

Public Hearing

**Thiru. M.Radakrishnan Rough Stone and Gravel
Quarry- 0.82.0 Ha**

At

**S.F.Nos. 425/29 of Lembalakudi Village,
Thirumayam Taluk, Pudukkottai District**

**Sector No. 1(a) (Sector No. 1 as per NABET)
Category of the Project: B1 (Cluster Mining)**

Project Proponent:

**Thiru. M.Radakrishnan
S/o. Muthuvel
No. 4-32A, Parali
Konapet Post, Thulaiyanoor,
Thirumayam Taluk
Pudukkottai District.**

Prepared By:

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EXECUTIVE SUMMARY

1. Project Background:

The Proposed project total extent area is 0.82.0 Ha, Own Patta land in S.F.No 425/29 in Lembalakudi Village of Thirumayam Taluk, Pudukkottai District. The category of project is B1, It is an Fresh Rough stone and Gravel quarry in Lembalakudi village. The area is situated on Plain terrain sloping towards Eastern side covered with Rough Stone which does not sustain any type of vegetation.

The quarry operation is proposed to carry out with open cast mechanized mining with 5.0 meter vertical bench with a bench width of 5.0 meter. The Quarry operation involves shot hole drilling with the help of compressor and jack hammers and smooth blasting, loading and transportation.

The quarry operation is proposed up to depth for 13.0m(Max) (3.0m Gravel and 10m Rough stone). The Total Geological reserve is about 5,31,960 m³ of Rough stone & 24,552 m³ Gravel . The Mineable Reserves of Rough stone is 38,690 m³ of Rough stone and 16,206 m³ of Gravel. The year-wise production/recoverable resources of rough stone for 5 years are 38,690 m³ of Rough stone and 16,206 m³ of Gravel.

Mining Plan was approved by The Assistant Director, Dept. of Geology & Mining, Pudukkottai vide Rc No: 85/2021 (G&M) dated 03.06.2022. The project area does not fall in Hill Area Conservation Authority region. There is no interstate boundary, CRZ zone, Western Ghats, notified Bird sanctuaries, wildlife sanctuaries as per Wild life protection Act 1972, within the radius of 15 Km.

2. Nature & Size of the Project

The Fresh Rough stone and Gravel Quarry over an extent of 0.82.0 Hectares land is located at Lembalakudi Village of Thirumayam Taluk, Pudukkottai District.

Mineral intends to quarry : Rough stone and Gravel
District : Pudukkottai
Taluk : Thirumayam

Village : Lembalakudi
S. F. Nos. : 425/29
Extent : 0.82.0 Hectares

Table 1: Brief Description of the Project

S. No	Particulars	Details
1	Latitude	10°16'45.07"N to 10°16'49.40"N
2	Longitude	78°43'26.26"E to 78°43'29.34"E
3	Site Elevation above MSL	107 m AMSL
4	Topography	Plain Terrain
5	Land use of the site	Own Patta Land
6	Extent of lease area	0.82.0 Hectares
7	Nearest highway	NH 36 (Manamadurai-Thanjavur) – 3.6 km, E SH 201 (Namanasamudram - Ponnamaravathi Road – 4.7 km, E)
8	Nearest railway station	Namanasamudram Railway Station – 7.7 km, NE
9	Nearest airport	Tiruchirapalli Airport- 54 km, N
10	Nearest town / city	Town - Lembalakudi – 4.6 km - N City - Thirumayam – 4.4 Km -S District - Pudukkottai - 14.4 Km -NE
11	Rivers / Canal	Nil in 15 km radius
12	Lake	Kotti Kanmaai – 6.3 kms, NE Panayampatti Pond – 2.1 kms, E Thekkathur Pond – 6.4 kms, NE Namanasamuthiram Lake – 6.8 kms, NE Melathemuthupatti Pond -9.3 kms, NE Katharuppan Kanmoi – 1.3 kms, SW Kottaiyur Big Lake – 6.7 kms, SE Senthamangalam Dam – 9.8 kms, N Alavayal Pond – 4 kms, SE Thirumayam Pond – 4.7 kms, SE Thirumayam Lake – 5.8 kms, SE

		Ooaniyur Pond – 8.5 kms, SE Siruma Kanmoi – 7.6 kms, SE Vengalur Lake – 10.3 kms, S Konapattu Lake – 11.0 kms, S Kavinadu Kanmai- 10.5 km, N
13	Hills / valleys	Parali Hill – 6.6 kms, N Thirumayam Fort – 4.4 kms, E
14	Archaeologically places	Nil in 15 km radius
15	National parks / Wildlife Sanctuaries	Nil in 15 km radius
16	Reserved / Protected Forests	Mallangudi RF – 5.4 kms, N Pulvayal Forest – 12.8 kms, N Sengirai R.F – 12 kms, SE Pandani Forest – 8.8 kms, SW Palaya Thirukolakudi Forest – 11.5 kms, W Vellar RF- 9.7 km, NE
17	Seismicity	Proposed Lease area come under Seismic zone-II (low risk area)
18	Defense Installations	Nil in 15 Km radius

3. Need for the Project

- ❖ The mining activities as proposed are the backbone of all construction and infrastructure projects as the raw material for construction is available only from such mining. The Rough stone and Gravel extracted will be transported to be Stone crusher of district Pudukkottai.
- ❖ The raw Rough stone as well as the crushed material of stone is in high demand in real estate, construction projects as well as in building construction projects.
- ❖ Rough stone is quarried for producing crusher aggregates to the nearby building contractors, road contractors and nearby villagers.
- ❖ After quarrying the entire reserves mined out, the area will be used as water reservoir to have an artificial recharge to the nearby wells.
- ❖ No damage to the land is caused, no reclamation or back filling is required.

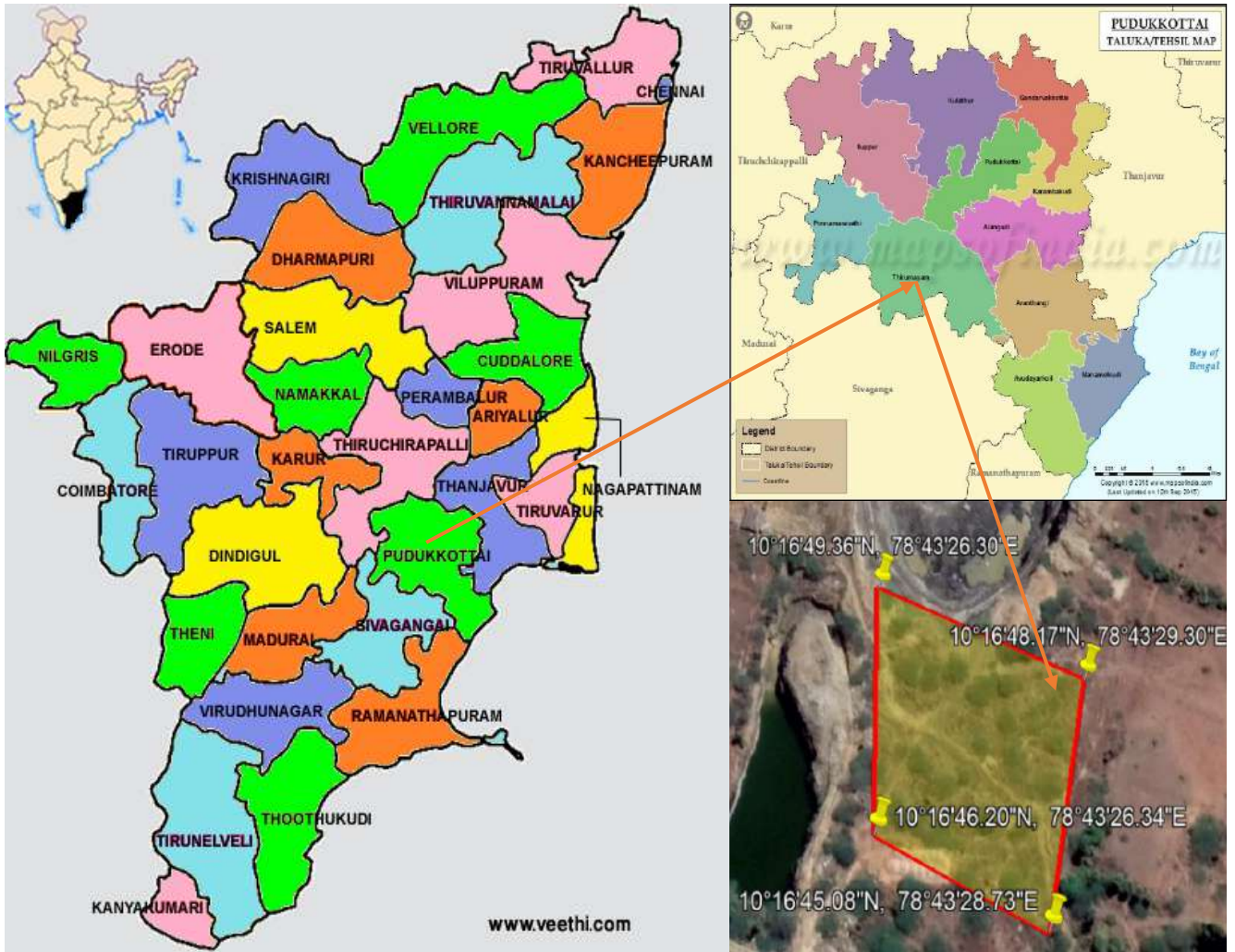


Figure 1: Location Map of the Project Site



Figure 2: Google Image of the Project Site

4. Charnockite

Charnockite and granitic gneisses are extensively quarried as rough stone which is used as aggregates for construction of building, laying of roads and for preparation of value added products like hollow blocks, pillar stones, M-sand etc. Charnockite occurs as massive bodies, greyish colour, medium to coarse grained, composed quartz, feldspar and orthopyroxene. At places, metamorphic gneissic banding (alternate dark and black colour) in Charnockite is noticed. Top portion, it gives gneissic appearance but 1-5m depth below it is typical Charnockite of grey colour. The area is mainly composed of Archaean Crystalline Metamorphic Complex. 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 general trend of formation is E-W dip $S60^{\circ}$.

5. Geological Resources

The geological reserves have been calculated based on the cross section method

Table 2. Geological resources

GEOLOGICAL RESOURCES						
Section	Length in (m)	Width in (m)	Depth in (m)	Volume m³	Geological Resources of Gravel in m³	Geological Resources of Rough stone in m³
XY-AB	93	88	3	24552	24552	
	93	88	65	531960		531960
TOTAL					24552	531960

Table 3. Year wise Production Plan

YEARWISE DEVELOPMENT & PRODUCTION RESERVES								
Year	Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume in m³	Gravel Formation in m³	Recoverable Reserves of Rough stone in m³
I	XY-AB	107-104	73	37	3	8103	8103	
		104-99	67	25	5	8375		8375
TOTAL							8103	8375
II	XY-AB	107-104	73	37	3	8103	8103	
		104-99	67	25	5	8375		8375
TOTAL							8103	8375
III	XY-AB	104-99	67	17	5	5695		5695
		99-94	57	8	5	2280		2280
TOTAL								7975
IV	XY-AB	99-94	57	24	5	6840		6840
TOTAL								6840
V	XY-AB	99-94	57	25	5	7125		7125
TOTAL								7125
GRAND TOTAL							16206	38690

6. Mining

Opencast mining

The quarry operation is proposed to carry out with conventional open cast mechanized mining with 5.0 meter vertical bench with a bench width of 5.0 meter with slope of 60°. The Quarry operation involves shallow jack hammer drilling, blasting, loading and transportation.

Process Description

- The reserves and resource are arrived based upon the Geological investigation
- Removal of Gravel by Excavators and directly Loaded into Tippers.
- Removal of Rough Stone by Excavators by Drilling and Blasting.
- Shallow Drilling With Jackhammer of 25.5 mm Dia.
- Minimum Blasting With Class 3 Explosives.
- Loading of Rough Stone By Excavators Into Tippers.

7. Water Requirement

Total water requirement for the mining project is 2.0 KLD. Domestic water will be sourced from nearby Lakshmipuram Village and other water will be source from nearby road tankers supply.

Table 4. Water Balance

Purpose	Quantity	Source
Domestic and Drinking Water	1.0 KLD	Packaged Drinking water vendors available in Lakshmipuram which is about 375 m NW of the area
Green belt	0.5 KLD	Other domestic activities through road tankers supply
Dust suppression	0.5 KLD	From road tankers supply
Total	2.0 KLD	

8. Manpower

Total manpower required for the project is approximately 18 persons. Workers will be from nearby villages.

Table 5. Man Power

1.	Management and Supervisor	Mines Manager/ Mate	2 No.
		Foreman	1 No.

		Blaster	1 No.
2.	Skilled	Operators & Excavator	2 Nos
3.	Semi-Skilled	Driver	2 Nos
4.	Unskilled	Labours, Cleaners & Watchman	10Nos
Total =			18 Nos

No child less than 18 years will be entertained during quarrying operations.

9. Solid Waste Management

Table 6 Solid Waste Management

Sl. No.	Type	Quantity	Disposal Method
1	Organic	3.24 kg/day	Municipal bin including food waste
2	Inorganic	4.86 kg/day	TNPCB authorized recyclers

As per CPCB guidelines: MSW per capita/day =0.45 kg/day

Table 7. 500m Radius Cluster Mine

1) Existing other quarries:

S. No.	Name of the Owner	Village & Taluk	S.F.Nos.	Extent in Hect.
1.	Thiru.S.Ravi	Lembalakudi Thirumayam	425/28	1.71.0
2	Thiru.A.M.Xavier	Lembalakudi Thirumayam	454 (part) and 455/2 (part)	2.00.0
3	Thiru.Appaz, S/o Sahul Hameed	Lembalakudi Thirumayam	421 (part)	1.21.5

2) Proposed Area

S. No.	Name of the Owner	Village & Taluk	S.F.Nos.	Extent in Hect.
1.	Thiru.M.Radakrishnan S/O Muthuvel	Lembalakudi Thirumayam	429/29	0.82.0
2.	Thiru.S.Ravi	Lembalakudi Thirumayam	425/6, 425/7 & 425/8	1.53.5

3) Lease Expired

S. No.	Name of the Owner	Village & Taluk	S.F.Nos.	Extent in Hect.	Lease Period
1.	K.Subbulakshmi W/O Krishnan	Lembalakudi Thirumayam	425/11	1.81.5	17.06.2009 to 16.06.2014
2	M.A.Murugappan S/o M.R.Manickam	Lembalakudi Thirumayam	425/1 (part)	1.00.0	10.12.2010 to 09.12.2015
3.	A.M.Zavier	Lembalakudi Thirumayam	425/28 (part)	1.00.0	17.06.2012 to 16.06.2017

The Total extent of the Existing / Lease expired / Proposed quarries are 7.28.0 Ha

10. Land Requirement

The total extent area of the project is 0.82.0 Ha, Own Patta land in Lembalakudi Village of Thirumayam Taluk, Pudukkottai District.

Table 8 Land Use Breakup

Sl. No.	Land Use	Present Area (Ha)	Area in use during the period (Ha)
01.	Quarrying Pit	Nil	0.53.4
02.	Infrastructure	Nil	0.01.0
03.	Roads	Nil	0.01.0
04.	Green Belt	Nil	0.15.0
05.	Unutilized	0.82.0	0.11.6
	Total	0.82.0	0.82.0

11. Human Settlement

There are no habitations within 500m radius. There are villages located in this area within 5 km radius of the quarry.

Table 9 Habitation

S.No	Direction	Village	Distance in kms	Population
1	North-East	Embanakutti	2.8Km	218
2	North - West	Lakshmipuram	375m	452

3	South - West	Perundurair	2.6 Km	224
4	South - East	Alamanastam	1.0 Km	127

12. Power Requirement

The Rough Stone and Gravel Quarry project does not require huge water and electricity for the project. **16 Litre** diesel per hour for excavator for mining and loading for Rough stone needed and **10 Litre** diesel per hour for excavator for mining and loading for Gravel.

13. Scope of the Baseline Study

This chapter contains information on existing environmental scenario on the following parameters.

1. Micro – Meteorology
2. Water Environment
3. Air Environment
4. Noise Environment
5. Soil / Land Environment
6. Biological Environment
7. Socio-economic Environment

13.1 Micro – Meteorology

Meteorology plays a vital role in affecting the dispersion of pollutants, once discharged into the atmosphere. Since meteorological factors show wide fluctuations with time, meaningful interpretation can be drawn only from long-term reliable data.

- i) Average Minimum Temperature : 18⁰ C to 23⁰ C
- ii) Average Maximum Temperature. : 30⁰ C to 40⁰ C
- iii) Average Annual Rainfall of the area : 821 mm

13.2 Air Environment

Ambient air monitoring was carried out on monthly basis in the surrounding areas of the Mine Lease area to assess the ambient air quality at the source. To know the ambient air quality at a larger distance i.e. in the study area of 5 km. radius, air quality survey has been conducted

at 5 locations. Major air pollutants like Particulate Matter (PM₁₀), Sulphur Dioxide (SO₂), Nitrogen Dioxide (NO₂) were monitored and the results are summarized below.

The baseline levels of PM₁₀ (62-35 µg/m³), PM_{2.5} (29-14 µg/m³), SO₂ (12-4 µg/m³), NO₂ (27-8 µg/m³), all the parameters are well within the standards prescribed by National Ambient Air Quality during the study period from June to August 2022.

13.3 Noise Environment

The maximum Day noise and Night noise were found to be 59 dB(A) and 45 dB(A) in Nayara Energy Limited, Panipulam and Thirumayam Court. The minimum Day Noise and Night noise were 43 dB (A) and 35 dB(A) respectively which was observed in Project site. The observed values are all well within the Standards prescribed by CPCB.

13.4 Water Environment

- The average pH ranges from 7.11 – 8.35.
- TDS value varied from 455 mg/l to 1405 mg/l
- Hardness varied from 284 to 604 mg/l
- Chloride varied from 71.5 to 403 mg/l

13.5 Land Environment

The analysis results shows that the majority of soil in the project and surrounding area is slightly alkaline in nature and pH value ranges from 6.24 to 8.12 with organic matter 0.14 to 0.41 %. The concentration of Nitrogen, Phosphorus & Potassium has been found to be in good amount in the soil samples.

13.6 Biological Environment

The proposed Mining lease area is mostly dry barren ground with small shrubs and bushes. No specific endangered flora & fauna exist within the mining lease area.

14. Rehabilitation/ Resettlement

- The overall land of the mine is Patta land. There are no displacement of the population within the project area and adjacent nearby area. Social development of nearby villages will be considered in this project.
- The mine area does not cover any habitation. Hence the mining activity does not involve any displacement of human settlement.
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15. Greenbelt Development

1. The development of greenbelt in the peripheral buffer zone of the mine area.
2. Green belt has been recommended as one of the major component of Environmental Management Plan, which will improve ecology, environment and quality of the surrounding area.
3. Local trees like Neem, Pungam, Panai, etc will be planted along the lease boundary and avenues as well as over Non-active dumps at a rate of 200 trees per annum with interval 5m.
4. The rate of survival expected to be 70% in this area

Table.10 Plantation/ Afforestation Program

Scientific Name	Local Name
<i>Pterospermum canscens</i>	Vennangu
<i>Streblus asper</i>	Piriya Maram
<i>Wrightia tinctoria</i>	Vepa
<i>Lagerstromia speciosa</i>	Poo Marudhu
<i>Toona ciliate</i>	Sandhana Vembu
<i>Morinda citrifolia</i>	Vellai nuna
<i>Pongamia Pinnata</i>	Pungam
<i>Strychnos potatorum</i>	Therthang Kottai
<i>Cordia dichroma</i>	Mookuchali Maram
<i>Borassus flabellifer</i>	Panai
<i>Albizia lebbek</i>	Vaagai
<i>Premna tomentosa</i>	Purangai Naari
<i>Litsea glutinosa</i>	Pisinpattai

16. Anticipated Environmental Impacts

16.1 Air Environment and Mitigation Measures

1. Water sprinkling will be done on the roads & unpaved roads.
2. Proper mitigation measures like water sprinkling will be adopted to control dust emissions.
3. Plantation will be carried out on approach roads, solid waste site & nearby mine premises.

4. To control the emissions regular preventive maintenance of equipments will be carried out.

16.2 Noise Environment and Mitigation Measures

1. Periodical monitoring of ambient noise will be done as per CPCB guidelines.
2. No other equipment except the transportation vehicles and excavator for loading will be allowed.
3. Noise generated by these equipments shall be intermittent and does not cause much adverse impact

17. Responsibilities for Environmental Management Cell (EMC)

The responsibilities of the EMC include the following:

- i. Environmental Monitoring of the surrounding area
- ii. Developing the green belt/Plantation
- iii. Ensuring minimal use of water
- iv. Proper implementation of pollution control measures

18. Environmental Monitoring Program

A monitoring schedule with respect to Ambient Air Quality, Water & Wastewater Quality, Noise Quality as per Tamil Nadu State Pollution Control Board (TNPCB), shall be maintained.

19. Project Cost

The total project cost is **Rs 42,76,000/-** for deployment of machinery and creation of infrastructural facilities like approach road, mine office / Workers Shed, First Aid Room etc., including electrifications and water supply

Table .11 Project Cost details

S. No.	Description	Cost (Rs.)
1	Fixed Asset Cost	11,56,000/-
2	Operational Cost	20,00,000 /-
	Total	31,56,000/-

Environmental Management Cost : Rs. 11,20,000/-

20. Corporate Environmental Responsibility

The Corporate Environment Responsibility (CER) fund will be provided to the below activity.

Table 12 CER Cost

.No.	CER Activity	CER value (Rs)
1.	Panchayat Union Middle School, Lembalakudi <ul style="list-style-type: none">➤ Construction of Children's Playground➤ R.O.Water Purifier➤ Printer➤ Projector attached Smart Class➤ Drinking Water Tank➤ Environmental books for library (in Tamil language)➤ Greenbelt facilities in and around the campus➤ Hygienic Toilet Facilities	5,00,000
Total		5,00,000

21. Benefits of the Project

- There is positive impact on socio-economics of people living in the villages. Mining operations in the subject area has positive impact by providing direct and indirect jobs opportunities
- The project is environmentally compatible, financially viable and would be in the interest of construction industry thereby indirectly benefiting the masses.
- Quarrying in this area is not going to have any negative impact on the social or cultural life of the villagers in the near vicinity.