SUMMARY

OF

DRAFT EIA/EMP REPORT

FOR

ROUGHSTONE AND GRAVEL QUARRY

EXTENT – 1.960 HA

YEAR	ROUGH STONE IN M3	GRAVEL IN M3	DEPTH(m)
1 to 5	1,22,500	61,100	20
6 to 10	1,35,625	-	20
TOTAL	2,58,125	61,100	40

VILLAGE – KONGANAKKURICHI, TALUK – ARUPPUKOTTAI

DISTRICT – VIRUDHUNAGAR , STATE – TAMILNADU

PROJECT PROPONENT

TMT. T. MUTHULAKSHMI

65/12/388, Kamaraj Nagar 2nd Street, Paramakudi Post,
Ramanathapuram District – 626102.

CONSULTANT

CREATIVE ENGINEERS & CONSULTANTS

Creating Possibilities

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AUGUST 2022

SUMMARY

1.1 INTRODUCTION:

Tmt.T.Muthulakshmi proposes to operate **Rough Stone and Gravel Quarry** in Survey No 100/6B, 100/7, 100/8, 100/9, 100/10 & 100/11 in Konganakkurichi village, Aruppukottai Taluk, Virudhunagar District, Tamil Nadu, over an area of 1.96 Ha for the production capacity of 2,58,125 m^3 of Rough Stone and 61,100 m^3 of Gravel upto a depth of 40m for the period of ten years. The Proposed Production for the first five years is 1,22,500 m^3 of Rough Stone and 61,100 m^3 of Gravel upto a depth of 20m. Entire land is owned by the applicant.

Although the individual lease area of this project is less than 5 Ha, the other existing quarries within the 500m radius along with this subject project works out to >5 Ha. Hence, this proposal is considered under Category – B1 and as per MoEF & CC notification necessitates preparation of EIA/EMP report and public hearing. As such Common EIA for Rough Stone and Gravel Quarry of Tmt.T.Muthulakshmi **,** Roughstone and Gravel Quarry of Thiru K.Balamurugan and Roughstone and Gravel Quarry of Thiru K.Bharathiraja falling in the cluster along with separate Environmental Impact Assessment & Environment Management Plan (EIA/EMP) report is carried out . A cumulative impact study has also been carried out**.**

This draft EIA/EMP report is prepared for the Rough Stone and Gravel Quarry of Tmt.T.Muthulakshmi. The impact assessment and management plan is studied for the peak production of the mine lease period and the entire area of quarry operation and can be construed as applicable for the entire lease period.

1.2 STATUTORY APPROVALS:

Table 1:Statutory Approvals

1.	Precise Area Communication Letter	KV1/75/2021-Kanimum dated 04.08.2021
2.	Mining Plan Approval	KV1/75/2021-Kanimum, dated 18.08.2021
3.	Terms of Reference	SEIAA-TN/F.No.8842/SEAC/ToR 1109/2022 21.03.2022.

Based on the conditions of Precise Area Communication letter, a safety distance of 10m is provided for the seasonal odai passing in the southern side and 7.5m safety distance has been left for the adjoining patta lands. As per TOR Condition, EIA/EMP report is prepared. Salent details of the report is given below.

2.1 SITE DESCRIPTION:

Table 2: Site Details

S.No	Particulars	Details
1.	Name of the Project	Rough Stone and Gravel Quarry of Tmt.T.Muthulakshmi
2.	Location of the project	Konganakkurichi village, Aruppukottai Taluk, Virudhunagar District, Tamil Nadu
3.	Survey No.	100/6B, 100/7, 100/8, 100/9, 100/10 & 100/11
4.	Proposed production	10 years - 2,58,125 m^3 of Rough Stone and 61,100 m^3 of Gravel 5 years - 1,22,500 m^3 of Rough Stone and 61,100 m^3 of Gravel
5.	Latitude & Longitude	**Latitude:** 9° 28' 35.7"N to 9° 28' 40.4"N **Longitude:** 78° 10'42.6"E to 78°10'47.2"E
6.	Mining Lease area	1.96 Ha
7.	Type of land	Own Patta Land
8.	Mine site topography	Almost Plain Terrain
9.	Accessibility	The lease area can be approached from Alangupatti - Kallurani Road which joins the SH-38 (Arupukottai - Valinokkam).
10.	Nearest Highway	(NH-45 B) – 8.0 km (SW)
11.	Nearest Railway station	Aruppukottai RS – 9km - NW
12.	Nearest Airport	Madurai – 60Km – NE
13.	Nearest major water bodies	• Seasonal Odai -10m (S) • Kanmai -330m E, • Seasonal Odai -570m –SE, • Kanmai 730m-S, ▪ Gundar River – 5.7km (NE).
14.	Environmental sensitive areas, Protected areas as per Wildlife Protection Act, 1972 (Tiger reserve, Elephant reserve, Biospheres, National parks, Wildlife sanctuaries, community reserves and conservation reserves)	Nil within 10 Km radius
15.	Local Places of Historical and Tourism Interest	Nil within 10 Km radius
16.	Reserved / Protected Forests	Nil within 10 Km radius
17.	Seismic Zone	Zone – II (Least Active)

Table 3: Technical Description

<table>
<tr><th>S.No</th><th>Particulars</th><th>Details</th></tr>
<tr><td>1.</td><td>Geological reserve</td><td>Roughstone – 6,85,125cum , Gravel- 78,300cum</td></tr>
<tr><td>2.</td><td>Mineable reserve</td><td>Roughstone – 2,58,125cum , Weathered Rock – 61,100cum</td></tr>
<tr><td>3.</td><td>Method of Mining</td><td>Opencast semi mechanized mining using jackhammer drilling, blasting, excavation through excavator & mineral transport through tippers.</td></tr>
<tr><td>4.</td><td>Production</td><td>
<table>
<tr><th>YEAR</th><th>Rough Stone m^3</th><th>Gravel in m^3</th><th>Top Soil m^3</th></tr>
<tr><td>I</td><td>16125</td><td>18800</td><td>4700</td></tr>
<tr><td>II</td><td>16125</td><td>18800</td><td>4700</td></tr>
<tr><td>III</td><td>16125</td><td>18800</td><td>4700</td></tr>
<tr><td>IV</td><td>33675</td><td>4700</td><td>1175</td></tr>
<tr><td>V</td><td>40450</td><td>--</td><td>--</td></tr>
<tr><td>Total 1 to 5</td><td>122500</td><td>61100</td><td>15275</td></tr>
<tr><td>Total 6 to 10</td><td>135625</td><td>--</td><td>--</td></tr>
<tr><td>Total 1 to 10</td><td>258125</td><td>61100</td><td>15275</td></tr>
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</td></tr>
<tr><td>5.</td><td>Lease Period</td><td>10 Years</td></tr>
<tr><td>6.</td><td>Waste Generation and Management</td><td>No waste generation anticipated in this quarry operation since the entire excavated material will be utilized.</td></tr>
<tr><td>7.</td><td>Ultimate Mine depth</td><td>First 5 years – up to 20m
Next 5 years - up to 40m</td></tr>
<tr><td>8.</td><td>Manpower</td><td>Direct – 18, Indirect – 50</td></tr>
<tr><td>9.</td><td>Water Requirement & source</td><td>Total water – 10 KLD
Will be procured from outside agencies initially. Later, water collected in the mine pit will be used to meet the needs.</td></tr>
<tr><td>10.</td><td>Power Requirement</td><td>All the equipment will be diesel operated. No electricity is needed for mining operation. The minimum power requirement for office, etc will be met from state grid.</td></tr>
<tr><td>11.</td><td>Site services</td><td>Mine office, first aid room, rest shelters, toilets etc. will be provided as semi-permanent structures.</td></tr>
<tr><td>12.</td><td>Project cost</td><td>Rs.1.92 Crores</td></tr>
<tr><td>13.</td><td>CER cost</td><td>Rs.5.0 Lakhs</td></tr>
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3.1 EXISTING ENVIRONMENTAL SCENARIO:

The studies and data collection have been carried out systematically and meticulously as per relevant IS codes, CPCB and MoEF&CC guidelines and as per approved ToR during **Summer Season (March 2022 to May 2022)** For the purpose of this study, the area has been divided into two zones, namely, core and buffer zones. The leases in the cluster area is considered to be the core zone, while buffer zone encompasses an area of 10 km radius distance from the periphery of core zone. Based on 2011 census data, in the 10km radius there are 65 Rural villages from Three Taluks namely Aruppukottai, Tiruchuli, Kamuthi and 3 urban areas of Aruppukottai Taluk namely Aruppukottai (M), Palayampatti (CT), Athipatti (CT) belonging to Virudhunagar and Ramanathapuram District.

Table 4: Social, Economic And Demographic Profile Of The Study Area

Details	Population	Percentage
A. Gender-wise distribution		
Male Population	102703	49.96
Female Population	102888	50.04
Total	**205591**	**100**
B. Caste-wise population distribution		
Scheduled Caste	18380	8.94
Scheduled Tribes	222	0.11
Other	186989	90.95
Total	**205591**	**100**
C. Literacy Levels		
Total Literate Population	157711	76.70
Others	47880	23.30
Total	**205591**	**100**
D. Occupational structure		
Main workers	87259	42.40
Marginal workers	10477	5.10
Total Workers	**97736**	**47.50**
Total Non-workers	**107855**	**52.50**
Total	**205591**	**100**

3.2.1 EXISTING ENVIRONMENTAL QUALITY:

Baseline monitoring was carried out during Summer Season (March 2022 to May 2022). The details of the same are provided below:

Table 5: Baseline Data

A) AMBIENT AIR QUALITY	**Monitoring Location –** 6 locations		
PARAMETER	**RESULT (µg/m3)**		***LIMIT (µg/m3)**
Location	**Core Zone**	**Buffer Zone**	
Particulate Matter (Size <10 µm)	55.1 – 73.8	40.4 – 68.6	100
Particulate Matter (Size <2.5 µm)	25.6 – 34.3	18.4 – 30.8	60
Sulphur Dioxide (as SO_2)	4.9 – 7.2	3.8 – 6.9	80
Nitrogen Dioxide (as NO_2)	7.7 – 12.7	5.4 – 11.1	80
Conclusion: The existing Ambient Air Quality levels for PM10, PM2.5, SO2 and NO2, are within the NAAQ standards prescribed CPCB limits of 100 µg/m3, 60 µg/m3, 80 µg/m3 & 80 µg/m3.			

B) WATER QUALITY	**Monitoring Location –** 5 locations	
PARAMETER	**Result**	***LIMIT (µg/m3)**
pH at 25 ˚C	7.71 – 8.36	**6.5-8.5**
Total Dissolved Solids, mg/L	328 – 1012	**2000**
Chloride as Cl-, mg/L	72.40 – 460	**1000**
Total Hardness (as CaCO3), mg/L	198 – 412	**600**
Total Alkalinity (as CaCO3), mg/L	173– 300	**600**
Sulphates as SO42-, mg/L	23 – 226	**400**
Iron as Fe, mg/L	BDL(D.L - 0.01) – 0.06	**0.3**
Nitrate as NO3, mg/L	BDL(D.L – 1.0) – 3.04	**45**
Fluoride as F, mg/L	0.12 – 0.35	**1.5**
Conclusion: The water quality of ground water is found to be within the prescribed Permissible limits of IS: 10500 Norms in the absence of an alternative source as per Drinking Water Specifications.		

C) NOISE LEVELS	**Monitoring Location –** 6 locations		
PARAMETER	**RESULT dB(A)**		***LIMIT (µg/m3)**
	Day Equivalent	**Night Equivalent**	
Core Zone	50.6	45.5 – 49.2	**90**
Buffer Zone	39.0	38.6 – 43.1	**Day Equivalent - 55dB(A), Night Equivalent - 45dB(A)**
*Permissible noise for industrial workers as laid down by CPCB (at 8 hrs Exposure Time). While comparing with the MoEF&CC Norms, the monitored ambient noise levels are generally within the limit values.			

D) SOIL QUALITY	**Monitoring Location –** 3 locations
PARAMETER	**Range of values**
pH	6.46 – 7.22
Electrical Conductivity (µmho/cm)	23.3 – 122.4
Organic matter (%)	0.9 – 1.24
Total Nitrogen (mg/kg)	128 – 142
Phosphorus (mg/kg)	1.3 – 2.14
Sodium (mg/kg)	345 - 420
Potassium (mg/kg)	637 – 756
Soil is of clay loam and sandy clay loam type.	

3.2.2 LAND EVIRONMENT:

Landuse pattern study carried out through remote sensing satellite data around the 10km buffer zone shows that 9.58 % of the buffer area is classified under the Agriculture/ Plantation followed by 46.47% of fallow land, 28.22 % constitutes land with scrub, 9.96 % constitutes land without scrub and the balance falls under other land use categories.

3.2.3 BIOLOGICAL ENVIRONMENT:

Flora: The lease area is a non forest, private land. Major part of lease area is barren fallow land with few bushes (Prosopis juliflora) and grasses. The buffer zone is dominated by species like Prosopis juliflora, Azadirachta indica, Borassus flabellifer, Acacia nilotica, Albizia lebbeck, Acacia leucophloea, Acacia auriculiformis, cocus nucifera etc. .

Fauna: There is no Wild Life Sanctuary or National Park within the study area of 10 km. Domesticated animals are commonly found. There is no Schedule I species in the core & buffer zone.

3.2.4 HYDROLOGICAL STUDY:

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. The water in the wells are available mainly after post monsoon and it reduces during summer necessitating only dry crops cultivation. Bore wells are as deep as 600 ft also and it reflects that the yield is only better at deeper water levels.

Based on the available information and the geophysical investigations it is found that in the project area due to hardrock formation water availability is consistent at deeper level

only(>100m). Since, the mining area consists of hard compact rock, no major water seepage within the mine is expected. There is no water seepage noticed in to the already quarried pits situated nearby the proposed quarry area. Hence, the quarrying rough stone up to the proposed depth may not have any adverse impact in the area over ground water conditions.

4.1 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

This is a proposed project and Semi – Mechanized Open Cast mining will be carried out to quarry out Rough Stone, & Gravel. The identified impacts due to this mine during mining and associated activities have been studied in relation to various environmental components like Air, water, noise, vibration, land, transport etc.

4.1.1 AIR ENVIRONMENT:

The principal sources of air pollution in general due to mining and allied activities will be Excavation, Drilling, Movement of HEMM such as Excavators, tippers etc., Loading and unloading operation and transportation. In case of this mine, the following measures will be adopted to control impact on the air quality due to mining operations in the lease area:

- Regular wetting of transport road using mobile water tanker.
- Wet drilling / Covering of drill holes with wet clothes
- Proper maintenance of roads.
- Avoiding overloading of tippers & Transportation of material by tarpaulin covered trucks
- Proper maintenance of HEMM to minimize gaseous emission
- Setting up of tyre washing facility in the lease area exit.
- Vehicular emission tests with digital smoke meter.
- Provision of tin sheet/ green netting around the lease periphery on all sides.
- Development of green belt/ plantation in various areas within the mine lease area etc.

By adoption of all these measures, no adverse impact on air quality is envisaged due to this proposed opencast mining operation.

The impact on air quality due to the proposed project is estimated using AERMOD View Gaussian Plume Air Dispersion Model.

The impact on air quality due to the proposed project estimated using computer dispersion model (AERMOD) show that the resultant added concentrations with baseline figures even at worst scenario, the values of ambient air quality with respect to PM_{10} are in the range of 52.6 μg/m3 to 75.6 μg/m3 and with respect to PM2.5 are in the range of 24.5 μg/m3 to 35.3 μg/m3 which are within the statutory limits in each case.

For preservation of environment in this mine strict enforcement of management schemes will be undertaken for taking corrective actions, as needed. By adopting the effective implementation of all the mitigative measures, no adverse impact on Air quality due to the mining operation in this lease area is expected.

4.1.2 WATER ENVIRONMENT:

The total water requirement for this project will be 10.0 KLD. The water will be sourced initially from outside agencies. Later the rainwater collected in the mine pit sump will be used for this purpose.

The domestic effluent to be generated from the project will be collected in septic tank with soak pits arrangements. This being a mining project there will not be any process effluent. The rain water falling in the quarry will be harvested in the sump at the lowest level of the quarry. This sump will act as a settling pond to prevent solids escaping along with discharge, before outlet. etc. Towards surface runoff management, garland drain will be constructed around the quarry and will be connected to a settling pond with silt traps. The supernatant clear water from the settling pond will be flow to the downstream users.

There is a drainage channel passing on the southern side of the lease area for which 10m safety zone has been left. Earthen bund will be formed along the banks of the drainage channel in proximity to the lease area and good plantation will be carried out in the safety zone area. Either side of the drainage channel near the lease area will be properly fenced with barbed wire and it will be ensured no impact is caused on this drainage course. There is no proposal to discharge any effluent into this water body.

4.1.3 NOISE ENVIRONMENT:

During mining operation there will be noise generation due to working of excavators, movement of vehicles, etc. However, it will be felt near the active working area only and at away from its source it will get reduced. There will also be attenuation due to vegetation , tin sheet/ green

netting to be erected by the proponent all around the lease and as such there will not be any adverse noise propagation outside the lease boundary Due to natural attenuation effects, by proper green belt development, design / maintenance of machines, etc., the impact on noise levels will be negligible and are expected to be well within the prescribed limits.

4.1.4 VIBRATION:

To reduce ground vibratory conditions, various control measures will be implemented such as controlled blasting using NONEL delay detonator, optimum design for burden and spacing, reducing explosive charge per delay to minimum, not carrying out blasting during strong winds, etc. By adoption of above measures, it will be ensured that ground vibrational levels due to blasting will be maintained within the prescribed DGMS conditions of 10 mm/s for the domestic houses/structures.

4.1.5 IMPACT ON LAND ENVIRONMENT:

. In the post mining stage, entire 1.52 Ha of mined out area will be left as water body, 0.03 Ha will be the mine roads & infrastructure, 0.36 Ha will be covered with vegetation and 0.05 Ha will be fencing. Entire mined out area will be properly fenced to prevent inadvertent entry of men and animals. In the post mining stage the rainwater harvested in the mined out void shall be utilized.

4.1.6 BIOLOGICAL ENVIRONMENT:

Other than clearing the shrubs and bushes withth in the lease area, no clearance of major vegetation is involved. Necessary mitigative measures like dust suppression, proper maintenance of equipment's, greenbelt and plantation etc., will be carried out to prevent dust generation & any further impact on the vegetation or agricultural activity nearby. In the lease area, safety barrier 7.5m around the periphery, 10m for Seasonal Odai on the southern side of the lease area. Greenbelt / Plantation will be carried out to enhance the vegetative growth and aesthetic in the safety zone area.

4.1.7 SOCIO ECONOMIC ENVIRONMENT:

The entire lease area is private patta land owned by the applicant. There are no habitations or hutments in the core zone area and no rehabilitation or resettlement problems will arise here.

The mining operations in the proposed mine will provide the following socio-economic benefits:

- Direct Employment for about 18 persons.
- Besides through allied opportunities in logistics, trading, repairing works etc. good employment potential will arise in this area, which will provide raising income levels and standards of living in the area through various service-related activities connected with the project operations.
- Benefit to State and central exchequer by way of royalty, taxes.

Towards the socio-economic development of the surrounding area, the proponent has earmarked an amount of Rs.5.0 Lakhs under Corporate Environmental Responsibility. The activities identified under CER will be implemented in a phased manner in the nearby Government school. In consultation with the locals based on the need & priority it will be implemented.

By carrying out systematic and scientific mining and implementing all the environmental mitigative measures it will be ensured that there will be no adverse impact on this front.

4.1.8 IMPACT ON LOCAL LOGISTICAL SYSTEM DUE TO PROJECT:

The material mined out from this lease area will be directly transported to the required customers. During the project operations, there will be 3 trips/hr. The transport route will be properly maintained to absorb this traffic due to this project. The following mitigative measures are suggested for mitigation of adverse impacts on the logistical aspect of the project:

- Water sprinkling on mineral in the transport vehicles before transporting, so that no dust nuisance during transport will arise.
- Plantation on either side of the transport road in consultation with the concerned department.
- Proper maintenance of transport road.
- Proper maintenance of transport vehicles.
- Avoiding overloading of material.
- Covering of loaded vehicles with tarpaulins sheet.
- Limiting of speed

4.1.9 WASTE MANAGEMENT:

There is no process effluent generation from this mine. Hence no liquid waste is generated. Single use plastics/ use and throwaway plastics will be banned in the site as directed by the Tamil Nadu Government vide GO(Ms)No.84 regarding ban on use of plastic products. The employees will be encouraged to use compostable material or reusable material.

5.1 ENVIRONMENTAL MONITORING PROGRAME:

Regular, systematic and sustained programme schedules for implementation and monitoring of various control measures are devised with clear cut guidelines of various concerned plans for keeping a continuous surveillance on the various environmental quality parameters in the area. The Mines Manager in the mine project site will be directly responsible for various environmental activities in the mine and will undertake effective monitoring and implementation of various environmental control measures promptly and effectively and to oversee various environmental management schemes for air quality control, water quality status, noise level control, plantation programme, social development schemes, etc in the mine. Towards EMP measures, Rs.6.15 lakhs is allocated under capital cost. Besides, Rs.12.60 lakhs per annum is allocated as recurring cost. The baseline monitoring carried out for this project reflects the cumulative impact of this existing quarry.

6.1 CUMULATIVE IMPACT STUDY:

As already mentioned, since this proposal is considered under cluster Category cumulative impact due to projects in the cluster is studied and given in the respective EIA/EMP reports. The baseline monitoring carried out for this project reflects the cumulative impact of the existing quarries and other activities

Combined cumulative computer Air Quality Model simulations carried out show that the resultant added concentrations with baseline figures with respect to PM_{10} is in the range of 52.6 $\mu g/m^3$ to 82.7 $\mu g/m^3$ and with respect to $PM_{2.5}$ are in the range of 24.5 $\mu g/m^3$ to 38.7 $\mu g/m^3$ which are within the statutory stipulations in respective case..

It is observed that the peak incremental concentration for PM_{10}, $PM_{2.5}$ is occurring very near the source. At away from the source the values are getting drastically reduced due to dispersion effects no effect is observed. Cumulative Noise modeling has been carried out to determine the post project noise levels due to the mining operations of the proposed quarries and it is

seen that that the post project concentration in the nearby areas are within the statutory limits of 55dB(A).

For all the environmental attributes, by implementing the mitigative measures as suggested in the report continuously and rigorously, no adverse impact on the surround environment is expected on the cumulative basis also.

7.1 CONCLUSION:

By systematic and scientific mining adhering to all the statutory norms and enforcing and strictly implementing the above said mitigation measures mentioned in this report, no adverse impact is envisaged. The proposed mining project will benefit this region in the fields of potential employment opportunities, improved income for local people, improved social welfare facilities in respect of education, etc. in its own way and also revenue to Government through royalty, taxes etc. Besides, it will meet the raw material requirement of the construction industry also.

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