ROUGH STONE AND GRAVEL QUARRY OF THIRU.D.MOHANRAJ

ML AREA – 12.56.5 Ha.

PEAK ANNUAL CAPACITY – ROUGH STONE – 412440 m^3

GRAVEL - 124371m^3

VILLAGE – PADMANABAMANGALAM, TALUK – SRIVAIKUNDAM,

DISTRICT – THOOTHUKUDI, STATE – TAMIL NADU

SUMMARY OF EIA / EMP REPORT

PROPONENT

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SUMMARY

1.1 INTRODUCTION:

Thiru. D. Mohanraj applied for grant of quarry lease for Rough Stone and Gravel Quarry over an extent of 12.56.5 Ha at Survey Nos. 760/1, 760/2, 762/1, 762/2A and 763 in Padmanabamangalam Village, Srivaigundam Taluk, Thoothukudi District.

Proceedings from the District Collector has been received vide letter G.M.1/129/2012. Department of Geology and mining vide their letter GM.1/129/2012 dated: 04.09.2014 have approved the Mining Plan.

This project was considered by the SEAC, Tamil Nadu on 18.07.2019 for grant of fresh ToR and the ToR was granted by the SEIAA, Tamil Nadu vide letter No**. SEIAA-TN/F.No.6805/SEAC/TOR-646/2019** dated 05.09.2019.

Based on this ToR granted by SEIAA, Tamil Nadu, EIA/EMP report has been prepared. Salient details of the EIA/EMP report are as follows:

1.2 SITE DESCRIPTION:

The salient features of the project are briefly given below.

SL.No	PARTICULARS	DETAILS
1	Name of the project	Rough Stone & Gravel Quarry of Thiru.D.Mohanraj
2	Extent	12.56.5 Ha
3	Capacity per annum	Peak production capacity of 412440m^3 of Rough Stone and 124371 m^3 of gravel
4	Village	Padmanabamangalam
5	Taluk	Srivaigundam
6	District	Thoothukudi
7	State	Tamil Nadu
8	Latitude	8^o 39’ 47”N to 8^o 40’ 05”N
9	Longitude	77^o 54’40”E to 77^o 54’ 52”E
10	Toposheet	58 H/14
11	Type of land	Patta Land
12	Surface elevation	95m to 101m AMSL and sloping towards East
13	Forest land	Nil in the lease area

SL.No	PARTICULARS	DETAILS
14	Average Annual rainfall	655mm
15	Nearest highway	NH-7A – Tirunelveli - Pudukottai – 8 km – N. SH-40 - Tirunelveli – Tiruchendur – 4 km – S.
16	Nearest Railway station	Srivaigundam Railway Station - 4.6 km - South
17	Nearest Airport	Thoothukudi – 14 Km
18	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)	As per MoEF & CC's final notification S.O.4075(E) dated 8th November 2019, Vallanadu Black buck sanctuary is located at a distance of 1.6km from the lease area. ESZ of the sanctuary lies around 0km to 0.82km from the boundary of the sanctuary. As such the project site is located outside the ESZ.
19	Reserved / Protected Forests	Vallanadu RF – 1.6 km
20	Other Industries in the study area	Other than few quarries and crusher units there are no other industries in the area.
21	Nearest town/City	Srivaikundam – 4.0 km
22	Nearest villages	Ariyabanallur -5km Manakkarai -4km Padmanabamangalam -2 km
23	Nearest major water bodies	Tamirabarani River – 3.1 km - S
24	Seismic Zone	Zone – II(Least Active)

2.1 PROJECT DESCRIPTION:

a) Peak production per annum : Rough Stone - 412440m^3 & Gravel 124371 m^3

b) Total Geological Resource : Rough Stone - 32,47,950 m^3 &
Gravel - 3,89,754 m^3

c) Total mineable reserves : Rough Stone - 20,18,520 m^3 &
Gravel - 2,73,738 m^3

d) Total waste removal : Overburden is in the form of weathered Gravel formation will be directly loaded into tippers and disposed to customers for the filling and leveling of low lying areas and other purpose

e) Method of Mining : Semi Mechanized Opencast mining

f) **Name of machinery** : **Nos.**

i.	Jack hammer	:	6
ii.	compressor	:	3
iii.	Excavator attached with Rock Breaker	:	1
iv.	Tippers	:	3

g) Bench height : 5 m

h) Maximum mine depth : 28m Below Ground level

i) Man power : Direct – 15 persons; Indirect - 50 persons

j) Mode of transport : By 10/20 T Tippers to consumers like external crusher units for producing stone aggregates of different sizes

k) Water requirement : 8.5m^3/day

l) Source of water : Bore well & Mine sump water

m) Life of the mine : 5 years

3.0 EXISTING ENVIRONMENTAL SCENARIO:

3.1 GENERAL:

Base line environmental data for various Environmental components were collected in the study area systematically and meticulously as per relevant IS codes, CPCB, MOEF&CC guidelines and as per approved TOR during October to December 2019. For the purposes of this study, the area has been divided into two zones, namely, core and buffer zones. Core zone covers 12.56.5 Ha of Mine lease area. The buffer zone covers an area of 10km radius from the periphery of the ML area. Entire ML area is a patta land with no forest or an agricultural area involved.

3. 2 SOCIO-ECONOMIC STATUS:

Based on 2011 census data, in the 10km radius there are 49 Rural villages from three Taluks namely Srivaikundam, Tiruchendur and Thoothukudi and 3 urban areas of two

taluks namely Srivaigundam (TP) & Perungulam (TP) of Srivaikundam Taluk and Alwarthirunagari (TP) of Tiruchendur Taluk. The distribution of population is as below:

- Male - 70753 (49.29%)
- Female - 72781 (50.71%)
- Total - 143534
- Scheduled caste - 36480 (25.41%)
- Scheduled tribes - 408 (0.29%)
- Total literacy rate in the area - 109851 (76.53%)

Male literacy rate is 40.05 % & Female literacy rate is 36.48% in total Population.

The occupational structure of the area is as below:

Total main workers - 53905 (37.56%)

Male main workers - 36866 (25.69%)

Female main workers - 17039 (11.87%)

Total marginal workers - 7365 (5.13%)

Total non-workers - 82264 (57.31%)

3. 3 AMBIENT AIR QUALITY:

No of AAQ Monitoring locations - 6		**Season: October to December 2019**
Parameter	**Range of Result (in µg/m^3)**	***CPCB Limit (µg/m^3)**
PM_{10}	38.2 – 60.9	**100**
$PM_{2.5}$	16.8 – 28.4	**60**
SO_2	BDL(D.L3.0) – 5.6	**80**
NO_2	4.1 – 13.3	**80**

- CO values in the all locations were found to be below detectable limit (DL – 1144 µg/m^3).
- Silica values in the study area are found to be below detectable limit (Detection limit – 0.05mg/m^3) which is well within the prescribed limit of 5mg/m^3

*__CPCB Limits for Industrial & Residential category (2009 Notification)__

3.3 WATER QUALITY:

No of Samples – 5 Bore well Water Samples		**October to December 2019**	
Parameter	**Bore Well water samples**	**IS 10500: Acceptable Limits**	**IS 10500: Permissible Limits**
pH	6.67 - 7.35	**6.5 - 8.5**	**No Relaxation**
Total Dissolved Solids, mg/l	702 - 885	**500**	**2000**
EC, µmhos/cm	1157 - 1462	**-**	**-**
Chloride (as Cl), mg/l	191 - 230	**250**	**1000**
Total Hardness (as $CaCO_3$), mg/l	282 - 365	**200**	**600**

Total Alkalinity (as $CaCO_3$), mg/l	135 - 270	**200**	**600**
Sulphate, mg/L	190 - 266	**200**	**400**
Iron (as Fe), mg/l	0.07 – 0.12	**0.3**	**No Relaxation**
Fluoride, mg/L	0.32 – 0.87	**1.0**	**1.5**
Nitrate as NO_3, mg/l	1.35 - 2.48	**45**	**No Relaxation**
Note: * IS10500: 2012 **** Permissible limits in the absence of Alternate Source**			

3.4 NOISE ENVIRONMENT:

No of locations - 6	**October to December 2019**	
Noise Level In dB(A)	**Core & Buffer Zone dB(A)**	***MOEF&CC Norms dB(A)**
Day Equivalent	42.0 to 49.0	**55**
Night Equivalent	37.9 to 41.6	**45**
Day and Night Equivalent	41.0 to 47.6	
*While comparing with the MOEF&CC Norm the monitored ambient noise levels were within the limit values for Residential areas.		

3.5 SOIL QUALITY:

Soil samples were collected from 3 locations to assess the soil quality in and around the mines. Results of the soil samples show that the pH values were found to be alkaline and Electrical Conductivity values were ranging between 42.11 – 65.47 µmhos/cm. Soils are generally clay loam types.

3.6 LAND ENVIRONMENT:

The entire proposed mine lease area of 12.565 Ha is a patta land with no forest or agricultural areas involved and is in project proponent's possession. All the lease area shall be used for mining and allied activities including green belt development. There are no habitations within the lease area and hence the question of rehabilitation does not arise.

Landuse pattern of buffer area studied through satellite imagery show that the cumulative agricultural area of three major sub-categories under "agriculture" such as Crop land, Fallow land and Plantation within the buffer area is estimated to be nearly 41.3%.

3.7 BIOLOGICAL ENVIRONMENT:

Vallanadu Wildlife Sanctuary is located at 1.6 Km (NW) from North western side of the lease area The Eco-sensitive zone as per Final Notification S.O 4075(E) dated 08.11.2019 of MOEF & CC, the extent of Eco-sensitive Zone varies from zero (northern side, due to NH 7A) kilometer to 2.00 kilometer around the Vallanadu Blackbuck sanctuary. The area of the Eco Sensitive Zone is 12.03 square kilometers. The lease area is 1.09 Kms from the sanctuary boundary and as such **the project does not attract clearance under Wild life protection Act – 1972(NBWL).**

Common species found like Neem, Karuvelem, Tamarind, thorny bushes and shrubs are dominantly observed.

3.8 HYDROLOGY:

The proposed lease area falls in **Srivaikundam block** and the stage of ground water development as per Central Ground Water Authority study is categorized under "**Safe"** category. The quarry operation is proposed upto a depth of 28m below the ground level. The water table is generally more than 35m to 40m BGL.

4.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.1 GENERAL:

Detailed impact assessment studies and planning of appropriate control measures have been undertaken for the proposed project. The study details are briefly given below:

4.2 AIR ENVIRONMENT:

Impact on air quality due to fugitive emissions consequent to this project operation was estimated based on the latest computer model – **ISCST (Industrial Source Complex Short Term Model)** developed by USEPA.

Peak hourly incremental concentrations have been computed using hourly meteorological data and from the study it is observed that the peak incremental 24 hourly particulate matter concentration under worst scenario works out to **4.04µg/m^3** and the distance of occurrence of the peak concentration is near the active working area. However at away places the values drastically comes down. From the study it can be seen that the resultant added concentrations with baseline figures even at worst scenario, show values of

ambient air quality in the range of **48.4μg/m^3 to 61.9 μg/m^3** which are within the NAAQ limits.

Adopting various mitigative measures like development of green barrier around mine, avoiding overloading of dumpers, Regular wetting of transport road using mobile water tanker, Covering of drill holes with wet cloth, Laying and maintenance of haul roads and other roads will be strictly as per standards, blacktopping of roads wherever necessary to minimize air-borne dust, Improved preventive maintenance practices of machinery, Using sharp teeth for shovel etc., will ensure that there will be no major impact on air quality due to this project.

4.3 WATER ENVIRONMENT:

The total water requirement for the proposed rough stone quarry will be 8.5 m^3/day which comprises 5.0 m^3/day of industrial requirement like Water sprinkling/dust suppression, 2.5 m^3/day of Green Belt development and 1.0 m^3/day of domestic needs. For domestic needs, the source of water will be from bore well. As for green belt, dust suppression, etc., rain water harvested in the mine sump will be used.

For domestic effluent, septic tank with soak pits are provided.

Since the entire material from the quarry face will be directly dispatched to the consumers, there will not be any rough stone stockpiles. There are no waste dumps in this quarry. As such there will not be any wash out due to stock pile or waste dumps.

Garland drains will be constructed along the quarry to collect the water falling on the site and the water will be made to flow in to settling ponds with silt traps. 3 number of settling ponds are proposed on the 3 locations on the Eastern side and garland drain will be constructed flanking the entire lease area. Water harvested using these measures will be used for green belt, dust suppression, water sprinkling, etc.

The formations are compact with less intergranular porosity and fractures leading to less permeability and transmissivity values. The general ground water level in this area is deep from surface. Besides, the water collected in the mine pit if any can also be supplied to nearby users if necessary.

4.4 NOISE ENVIRONMENT:

During mining operation there will be noise generation due to working of shovels, drilling, blasting, movement of vehicles, etc., 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 limits prescribed by Environment Protection Rules 1986 and CPCB.

Avenue plantations and green belt will be created around mine periphery to abate noise levels in the area to the minimum.

4.5.1 IMPACT DUE TO GROUND LEVEL VIBRATIONAL EFFECTS FROM BLASTING OPERATIONS AND CONTROL MEASURES THEREON:

The vibration due to blasting can cause damage to the nearby structures if appropriate technology and control measures are not adopted in the blasting operation.

The impact due to blasting vibration in the proposed Rough Stone quarry is calculated based on accepted empirical equation in the nearby villages under worst scenario which is well within the DGMS limit.

In the proposed quarry blasting & vibration effects will be well controlled by following various measures suggested by NIRM and its details are as follows:

- Optimum design for burden and spacing and reduced quantity of explosives.
- Inclined drilling practice, whenever necessary.
- Using electric milli second delay detonators / NONEL, in combination with detonating fuse etc. This sequence of blasting reduces vibration to a large extent, thereby minimizing propagation of shock waves.

By adoption of above measures, it will be ensured that that there is no impact due to blasting vibration in the nearby area.

4.6 IMPACT ON LAND ENVIRONMENT:

The entire mine lease area of 12.56.5 Ha is patta land and is in Proponents possession.

Since, the life of the mine is expected to be 5 years, end of year 5 will be the ultimate stage of mining. In the ultimate stage, the depth of mining will be 28m below the ground level.

At the end of mine life the entire mined out area of 10.845 Ha will be left as water body. The mined out area will be properly fenced all around. Besides, it is also suggested to construct barbed wire fencing around the quarried pit to prevent inherent entry of the public and cattle. However, during extraction of Rough Stone, an earth bund will be formed around the quarry area to prevent inherent entry of public and animals into the quarry area.

The rain water falling in the quarry will be harvested in this quarried out pit. This pit will act as a settling pond to prevent solids escaping along with discharge, before outlet etc. This water storage will enhance the static level and ground water recharge of nearby wells. Most of the mine pit water will be used for green belt, dust suppression, etc.

4.7 BIOLOGICAL ENVIRONMENT:

The core zone area is a hard rock formation area, with barren patches. As such no clearance of major vegetation was involved. To reduce the adverse effects on flora / fauna status of the area necessary mitigative measures like dust suppression, proper maintenance of equipment's, roads, development of Green belt will be carried out. A budget of Rs. 1.75 Lakhs has been provided for species conservation .

4.8 SOCIO ECONOMIC ENVIRONMENT:

As there are no habitations or hutments in the core zone area, no rehabilitation or resettlement problems will arise here.

As the mining operations in the proposed mine will employ about 15 persons directly and about 50 persons on indirect basis 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.

Besides, there will be improvement of various facilities in the local areas due to project operation like Improvement in educational services, Infrastructural betterment through better roads, lighting and communicational systems, Betterment of drinking water facilities, benefit to the State and the Central governments through financial revenues by way of royalty, tax, GST, etc from this project directly and also indirectly.

From above details, it is clear that the project operations will have beneficial positive impact in the area.

The project proponent has planned to carry out CER/CSR activities mainly in the areas of Education development, Medical and Community/Infrastructure development to the local community around the project site based on the needs of the people. For future CSR activities, need based assessment for the local community to the tune of Rs.20 lakhs (for 5 years) is made.

5.0 ENVIRONMENTAL MONITORING PROGRAMME:

In this proposed project, appropriate environmental monitoring programme are framed. 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/Mine Incharge 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. 12 lakhs will be spent under capital cost and Rs. 6 lakh under recurring cost.

6.0 CONCLUSION:

Efficient and effective implementation of environmental management plan, as described above, will ensure that all the environmental parameters will be maintained well within statutorily sustainable levels. The proposed quarry will also brought improvements in physical and social infrastructures in the nearby area and there will be good social upliftment in the area, along with visible biological improvement due to proposed greenbelt development and land reclamation.

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