

SUMMARY
OF
DRAFT EIA/EMP REPORT
FOR
**ROUGHSTONE AND
GRAVEL QUARRY**

| | |
|-------------------|--|
| EXTENT | 3.164 Ha (PATTA LAND) |
| PRODUCTION | ROUGHSTONE – 2,64,480 m³ GRAVEL – 64,780 m³ |
| PERIOD | 5 YEARS |

**VILLAGE –NATHIKUDI, TALUK- VEMBAKOTTAI
DISTRICT- VIRUDHUNAGAR, STATE – TAMIL NADU**

PROJECT PROPONENT

THIRU S. RADHAKRISHNAN

D.No.1/128, Malliputhur Village, Srivilliputhur Taluk, Virudhunagar District.

CONSULTANT

CREATIVE ENGINEERS & CONSULTANTS

NABET accredited vide Certificate no. NABET/EIA/2023/RA 0187,

9B/4, Bharathwajar Street, East Tambaram, Chennai-600 059.

Ph: 09444133619, Email : cecgiri@yahoo.com,



Creating Possibilities

AUGUST 2022

ROUGHSTONE AND GRAVEL QUARRY OF THIRU S.RADHAKRISHNAN AT SURVEY NO. 886/2, 886/7 AND 886/9 OVER AN AREA OF 3.164 HA IN NATHIKUDI VILLAGE, VEMBAKOTTAI TALUK, VIRUDHUNAGAR DISTRICT, TAMIL NADU

SUMMARY

1.1 INTRODUCTION:

Thiru.S.Radhakrishnan proposes to operate a **Rough Stone and Gravel Quarry** at Survey No. 886/2, 886/7 and 886/9 over an area of 3.164 Hectares In Nathikudi Village, Vembakottai Taluk, Virudhunagar District, Tamil Nadu, for the ToR approved production capacity of 2,64,480 m³ of Rough Stone and 64,780m³ of Gravel for the period of five years. It is a own patta land.

Although the individual lease area of this project is less than 5 Ha, the other quarries within the 500m radius along with this subject project works out to > 5Ha and as such this proposal is considered under Category – B1 Necessitating preparation of EIA/EMP Report and public hearing .

Quarrying in this lease area was earlier carried out by applicant for the period of 09.01.2014 to 08.01.2019 with the proceeding no. KV1/30513/2013 dated 03.10.2013. eastern part of the lease area is partly mined .

1.2 STATUTORY APPROVALS:

| | | |
|----|-----------------------------------|---|
| 1. | Precise Area Communication Letter | KV1/879/2018-Kanimum, dated 24.02.2021 |
| 2. | Mining Plan Approval | KV1/879/2018, dated 09.07.2021 |
| 3. | Terms of Reference | SEIAA-TN/F.No.8867/SEAC/TOR-1124/2021 dated 23.03.2022. |

Based on the conditions of Precise Area Communication letter, a safety distance of 50m is provided for the drainage channel passing in the eastern 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 No.1: SITE DETAILS

| S.No | Particulars | Details |
|------|----------------------------|---|
| 1. | Name of the Project | Rough Stone and Gravel Quarry of Thiru S.Radhakrishnan |
| 2. | Location of the project | Nathikudi Village, Vembakottai Taluk, Virudhunagar District, Tamil Nadu |
| 3. | Proposed 5 year production | Roughstone - 2,64,480 m ³ Gravel - 64,780m ³ |



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| S.No | Particulars | Details |
|------|---|--|
| 4. | Latitude & Longitude | Latitude: 9°26'21.8" N to 9°26'26.0" N Longitude: 77°41'32.0" E to 77°41'44.5"E |
| 5. | Mining Lease area | 3.164 Ha |
| 6. | Type of land | Private Patta Land owned by the applicant |
| 7. | Mine site topography | Almost Plain Terrain |
| 8. | Accessibility | The lease area can be approached from Malliputhur – Paraipatti Road which joins the SH-42 (Srivilliputtur – Sivakasi). |
| 9. | Nearest Highway | SH-183– 6.0Km (SE) |
| 10. | Nearest Railway station | Sivakasi – 10Km - NE |
| 11. | Nearest Airport | Madurai – 62Km - N |
| 12. | Nearest major water bodies | <ul style="list-style-type: none"> • Odai- E • Odai-165m-W, • Kayalkudi River -1.7km (SW) • Nedunkulam Odai – 3.1km(SW) ▪ Marugal odai - 7.0km-(SW) |
| 13. | 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 |
| 14. | Local Places of Historical and Tourism Interest | Nil within 10 Km radius |
| 15. | Reserved / Protected Forests | Nil within 10 Km radius |
| 16. | Seismic Zone | Zone – II (Least Active) |

Table No.2: TECHNICAL DESCRIPTION

| S.No | Particulars | Details | | | |
|------|--------------------|--|--------------------------|-----------------------|-----------------------------|
| 1. | Geological reserve | Roughstone – 8,64,240 cum , Gravel - 1,09,785 cum | | | |
| 2. | Mineable reserve | Roughstone – 2,64,480 cum , Gravel - 64,780 cum | | | |
| 3. | Method of Mining | Opencast semi mechanized mining using jackhammer drilling, blasting, excavation through excavator & mineral transport through tippers. | | | |
| 4. | Production | YEAR | TOP SOIL IN CU. M | GRAVEL IN CU.M | ROUGH STONE IN CU.M. |
| | | I | 3280 | 16400 | 47,988 |



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| S.No | Particulars | Details | | | |
|------|---------------------------------|--|---------------|---------------|-----------------|
| | | | | | |
| | | II | 3280 | 16400 | 48,372 |
| | | III | 3280 | 16400 | 48,816 |
| | | IV | 3116 | 15580 | 50,088 |
| | | V | --- | --- | 69,216 |
| | | TOTAL | 12,956 | 64,780 | 2,64,480 |
| 5. | Life of the mine | 5 Years | | | |
| 6. | Waste Generation and Management | No waste generation anticipated in this quarry operation since the entire excavated material will be utilized. | | | |
| 7. | Ultimate Mine depth | 36m bgl. | | | |
| 8. | Manpower | Direct – 18, Indirect – 50 | | | |
| 9. | Water Requirement & source | 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. | | | |
| 10. | Power Requirement | 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. | | | |
| 11. | Site services | Mine office, first aid room, rest shelters, toilets etc. will be provided as semi-permanent structures. | | | |
| 12. | Project cost | Rs.2.95 Crores | | | |
| 13. | CER cost | Rs.6.0 Lakhs | | | |

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 **Winter Season, December 2021 to February 2022**) For the purpose of this study, the area has been divided into two zones, namely, core and buffer zones. Core zone is considered as the total lease area, 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 28 Rural villages from Vembakottai Taluk, Virudhunagar District.

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Table No.3: SOCIAL, ECONOMIC AND DEMOGRAPHIC PROFILE OF THE STUDY AREA

| Details | Population | Percentage |
|--|----------------|--------------|
| A. Gender-wise distribution | | |
| Male Population | 134570 | 49.67 |
| Female Population | 136384 | 50.33 |
| Total | 270954 | 100 |
| B. Caste-wise population distribution | | |
| Scheduled Caste | 48390 | 17.86 |
| Scheduled Tribes | 292 | 0.11 |
| Other | 222272 | 82.03 |
| Total | 270954 | 100 |
| C. Literate and Illiterate population | | |
| Literate Males | 107012 | 39.49 |
| Literate Females | 91000 | 33.59 |
| Total Literate Population | 198012 | 73.08 |
| Others Males | 27558 | 10.17 |
| Others Females | 45384 | 16.75 |
| Others Population | 72942 | 26.92 |
| Total | 270954 | 100 |
| D. Occupational structure | | |
| Main workers | 119491 | 44.10 |
| Marginal workers | 10992 | 4.06 |
| Total Workers | 130,483 | 48.16 |
| Total Non-workers | 140471 | 51.84 |
| Total | 270954 | 100 |

3.2.1 EXISTING ENVIRONMENTAL QUALITY:

Baseline monitoring was carried out during Winter Season, December 2021 to February 2022). The details of the same are provided below:

Table Error! No text of specified style in document..1: Baseline Data

| A) AMBIENT AIR QUALITY | Monitoring Location – 7 locations | | |
|---------------------------------------|--|--------------------|----------------------------------|
| PARAMETER | RESULT (µg/m³) | | *LIMIT (µg/m³) |
| Location | Core Zone | Buffer Zone | |
| Particulate Matter (Size <10 µm) | 52.2 – 74.8 | 39.9 – 58.4 | 100 |
| Particulate Matter (Size <2.5 µm) | 25.1 – 35.9 | 18.8 – 28.1 | 60 |
| Sulphur Dioxide (as SO ₂) | 5.1 – 7.6 | 3.8 – 8.5 | 80 |

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| | | | |
|---|------------------------|--|---|
| Nitrogen Dioxide (as NO ₂) | 6.9 – 9.2 | 4.6 – 10.2 | 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/m ³ , 60 µg/m ³ , 80 µg/m ³ & 80 µg/m ³ . The CO values in all the locations were found to be below detectable limit. Silica values in the study area are found to be below detectable limit. (Detection limit – 0.05 mg/m ³) | | | |
| B) WATER QUALITY | | Monitoring Location – 6 locations | |
| PARAMETER | Result | *LIMIT (µg/m³) | |
| pH at 25 °C | 7.24 – 8.2 | 6.5-8.5 | |
| Total Dissolved Solids, mg/L | 236 – 1002 | 2000 | |
| Chloride as Cl ⁻ , mg/L | 34.2 – 342 | 1000 | |
| Total Hardness (as CaCO ₃), mg/L | 171 – 431 | 600 | |
| Total Alkalinity (as CaCO ₃), mg/L | 147– 326 | 600 | |
| Sulphates as SO ₄ ²⁻ , mg/L | 13.6 – 208 | 400 | |
| Iron as Fe, mg/L | 0.04 – 0.15 | 0.3 | |
| Nitrate as NO ₃ , mg/L | 1.8 – 9.60 | 45 | |
| Fluoride as F, mg/L | 0.13 – 0.58 | 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 – 7 locations | |
| PARAMETER | RESULT dB(A) | | *LIMIT (µg/m³) |
| | Day Equivalent | Night Equivalent | |
| Core Zone | 51.9 | 39.4 | 90 |
| Buffer Zone | 44.8 – 50.6 | 37.3 – 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 | 6.89 – 7.35 | | |
| Electrical Conductivity (µmho/cm) | 98.4 – 181.6 | | |
| Organic matter (%) | 1.56 – 2.55 | | |
| Total Nitrogen (mg/kg) | 590 - 751 | | |
| Phosphorus (mg/kg) | 1.34 – 1 .59 | | |
| Sodium (mg/kg) | 199 – 218 | | |
| Potassium (mg/kg) | 592-766 | | |
| Soil is of Silt Loam type. | | | |

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3.2.2 LAND ENVIRONMENT:

Landuse pattern study carried out through remote sensing satellite data around the 10km buffer zone shows that 26.91% of the buffer area is classified under the Agriculture/ Plantation followed by 44.72 % of fallow land, 12.01 % constitutes land with scrub, 7.10 % 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. Eastern part of the lease area is already mined, exposed with rock and western part contains abandoned crusher items. The lease area is dominated with *Prosopis juliflora*. Proponent has carried out casurina plantation around his crusher near the lease area. The Dominated species in the buffer zone are *Albizia lebeck*, *Acacia auriculiformis*, *Sygygium cumuni*, *Borassus flabellifer*, *Azadirachta indica*, *Prosopis juliflora*, etc. Patches of coconut and casurina farms are also observed.

Fauna: There is no Wild Life Sanctuary or National Park within the study area of 10 km. Domesticated animals are commonly found. No wild mammalian species was directly sighted during the field survey. 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 groundwater has revealed that potential fractures are encountered at deeper levels. Rain water collected in the tanks in the region acts as a good source of water during post monsoon. The water in the wells are available mainly after post monsoon and it reduces during summer. Bore wells are as deep as 500 ft also and it reflects that the yield is only better at deeper water levels

The occurrence of groundwater mainly in the porous soil are weathered layers, very negligible amount of groundwater percolated through the poorly fractured layer, after that there is no existence of groundwater. Besides, the mining area consists of hard compact rock, no major water seepage within the mine is expected. From the nearby working mines, no such seepage is also observed.

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

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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. Proponent has already installed fixed water sprinkler in the road connecting the mine and the nearby crusher..
- 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 resultant added concentrations with baseline figures even at worst scenario, show that the values of ambient air quality with respect to PM₁₀ are in the range of 51.2 µg/m³ to 79.2 µg/m³ and with respect to PM_{2.5} are in the range of 25.2 µg/m³ to 37.5 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

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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 an drainage channel located in the eastern side adjacent to the lease area. A safety distance of 50m has been left from the lease boundary for the same. 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.

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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 2.41 Ha of mined out area will be left as water body, 0.10 Ha will be the mine roads & infrastructure, 0.554 Ha will be covered with vegetation and 0.10 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:

Part of the lease area is already mined and free from major vegetation. No clearance of major vegetation is involved since eastern part of the lease area is already mined, exposed with rock and western part contains abandoned crusher items. 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.

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.

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- 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.6.0 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 5 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.
- ❖ Keeping traffic regulators at vulnerable locations.
- ❖ Limiting of speed
- ❖ Installation of barriers at vulnerable locations

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.

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5.1 ENVIRONMENTAL MONITORING PROGRAMME:

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.16.9 Lakhs is allocated as capital cost, Rs. 13.6 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 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, medical healthcare systems, 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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