

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

EXTENT – 1.62.17 HA

YEAR	ROUGH STONE IN M3	GRAVEL IN M3	DEPTH(m)
1 to 5	1,14,760.0	26,325	17
6 to 10	1,27,707.5	----	30
TOTAL	2,42,467.5	26,325	47

VILLAGE – KALLANAI, TALUK – KALLIGUDI

DISTRICT – MADURAI , STATE – TAMILNADU

PROJECT PROPONENT

THIRU. S. RATHINAM

Chinna Udaippu Village, Perungudi Post, Madurai South
Madurai District- 625022.

CONSULTANT

CREATIVE ENGINEERS & CONSULTANTS



Creating Possibilities

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OCTOBER 2023

DRAFT EIA/EMP REPORT FOR ROUGH STONE AND GRAVEL QUARRY OF THIRU. S. RATHINAM AT SURVEY NOS. 84/2C1,2D1,2E1, 2C2,2D2A,2E2,2J,2K,2L (PATTA LAND) OVER AN AREA OF 1.62.17 HA IN KALLANAI VILLAGE, KALLIGUDI TALUK, MADURAI DISTRICT, TAMIL NADU.

SUMMARY

1.1 INTRODUCTION:

Thiru. S. Rathinam proposes to operate a Rough Stone and Gravel Quarry over an area of 1.62.17 Ha in Kallanai Village, Kalligudi Taluk, Madurai District, Tamil Nadu and has initiated action towards obtaining environmental clearance. Lease period is 10 years. Fresh lease. No mining is carried out in the lease area so far.

Total production is 1,14,760.0 m³ of Rough stone and 26,325 m³ of gravel for the depth of 17 meter. The Total production for 10 years lease period is 2,42,467.5m³ of Rough Stone and 26,325m³ of gravel for the depth of 47 meter.

Although the individual lease area of this project is less than 5 Ha, the other existing and proposed quarries within the 500m radius cluster 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.

The impact assessment and mitigative measures is carried out 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:

1.	Precise Area Communication Letter	Rc.No.08/Mines/2023 dated 14.03.2023.
2.	Mining Plan Approval	Rc.No.08/Mines/2023 dated 10.04.2023
3.	Terms of Reference	Received from SEIAA, Tamil Nadu vide their Lr No.SEIAA-TN/F.No.10072/SEAC/ToR 1506/2023 dated 31.07.2023

Based on the conditions of Precise Area Communication letter, a safety distance of 7.5m safety distance has been left for the adjoining patta lands, 50m for the Odai. As per TOR Condition, EIA/EMP report is prepared. Salient details of the report is given below.



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2.1 SITE DESCRIPTION:

Table No.1: SITE DETAILS

Particulars	Details
Name of the Project	Rough Stone and Gravel Quarry of Thiru. S. Rathinam.
Location of the project	Kallanai Village, Kalligudi Taluk, Madurai District, Tamil Nadu.
Latitude & Longitude	Latitude: 9° 45' 54.5" to 9° 45' 57.3" N Longitude: 78° 02' 40.4" to 78° 02' 46.3" E
Mining Lease area	1.62.17 Ha
Type of land	The lease area of 1.62.17 Ha is a patta land in the name of the applicant.
Mine site topography	Almost Plain Terrain
Accessibility	The applied area can be easily accessible Viralipatti at a distance of 18Kms from Madurai to Thoothukudi road, and then to the applied area at a distance of 5Km towards west of Paraipatti. The nearest railway station is Thirumangalam at a distance of 13km.
Nearest Highway	(NH-45 B) – 5.0km (E) (NH-7) – 7.1km (W)
Nearest Railway station	Thirumangalam RS – 8.8km – (NW)
Nearest Airport	Madurai – 9.3Km – (NE)
Nearest major water bodies	<ul style="list-style-type: none"> ➤ Terku Ar – Less then 1km- (SW), ➤ Gundar River – 5.1km–SW, ➤ Gundaru Nadi – 7.4km – (SW)
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
Notified Archaeologically important places, Monuments	Nil within 10m radius
Reserved / Protected Forests	Nil within 10m radius
Seismic Zone	Zone – II (Least Active)

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Table No.2: TECHNICAL DESCRIPTION

Particulars	Details		
Geological reserve	8,06,520 Cu.m.		
Mineable reserve up to 47m depth	2,68,792.5 Cu.m.		
Method of Mining	Open cast mechanized mining method with drilling, blasting, excavation, loading and transportation of Roughstone to needy buyers.		
Production	Year	GRAVEL(m3)	ROUGHSTONE (m3)
	I	9000	19,702.5
	II	9000	19,702.5
	III	8325	19,702.5
	IV	----	28,950.0
	V	----	26,702.5
	First 5 Year Total	26,325	1,14,760.0
	2nd 5 year Total	----	1,27,707.5
	10Year Total	26,325	2,42,467.5
Life of the mine	10 Years		
Waste Generation and Management	No waste generation anticipated in this quarry operation since the entire excavated material will be utilized.		
Ultimate Mine depth	47m		
Manpower	9 People directly and more than 50 people indirectly		
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.		
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.		
Site services	Mine office, first aid room, rest shelters, toilets etc. will be provided as semi-permanent structures.		
Project cost	Rs. 95,93,468 /-		
CER cost	Rs.5.0 Lakhs		

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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 2023 to May 2023)** 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 72 Rural villages from Three Taluks namely Madurai South, Thirumangalam, Kariapatti and 2 urban areas of Madurai South Taluk namely Nilaiyur (I Bit) (CT), and Thirumangalam Taluk namely Thirumangalam (M) belonging to Madurai and Virudhunagar District..

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

Details	Population	Percentage
A. Gender-wise distribution		
Male Population	104850	50.37
Female Population	103318	49.63
Total	208168	100
B. Caste-wise population distribution		
Scheduled Caste	30966	14.88
Scheduled Tribes	83	0.04
Other	177119	85.08
Total	208168	100
C. Literacy Levels		
Total Literate Population	145052	69.68
Others	63116	30.32
Total	208168	100
D. Occupational structure		
Main workers	88406	42.50
Marginal workers	12127	5.80
Total Workers	100533	48.30
Total Non-workers	107635	51.70
Total	208168	100



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3.2.1 EXISTING ENVIRONMENTAL QUALITY:

Table 1: Baseline Data

A) METEOROLOGICAL DATA			
PARAMETERS	MINIMUM		MAXIMUM
Temperature in °C	21.0		39.0
Humidity in %	18.2		94.0
Wind speed Km/Hr	<1.8		33.5
Predominant wind direction (From)	E,ENE		
B) AMBIENT AIR QUALITY			
Monitoring Location – 5 locations			
PARAMETER	RESULT (µg/m3)		*LIMIT (µg/m3)
Location	Core Zone	Buffer Zone	
Particulate Matter (Size <10 µm)	49.3 – 63.1	43.1– 58.1	100
Particulate Matter (Size <2.5 µm)	24.6– 32.1	21.3 – 30.1	60
Sulphur Dioxide (as SO ₂)	5.8– 7.9	4.9 – 7.9	80
Nitrogen Dioxide (as NO ₂)	9.6– 15.8	8.2 – 14.2	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/m3, 60 µg/m3, 80 µg/m3 & 80 µg/m3. 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/m3)			
C) WATER QUALITY			
Monitoring Location – 5 locations			
PARAMETER	Result		*LIMIT (µg/m3)
pH at 25 °C	6.97 – 7.54		6.5-8.5
Total Dissolved Solids, mg/L	560 – 1110		2000
Chloride as Cl-, mg/L	56.7 – 440		1000
Total Hardness (as CaCO ₃), mg/L	321 – 559		600
Total Alkalinity (as CaCO ₃), mg/L	186– 314		600
Sulphates as SO ₄ ²⁻ , mg/L	167 – 344		400
Iron as Fe, mg/L	0.04 – 0.11		0.3
Nitrate as NO ₃ , mg/L	3.25 – 6.54		45
Fluoride as F, mg/L	0.42 – 0.56		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.			



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D) NOISE LEVELS		Monitoring Location – 5 locations	
PARAMETER	RESULT dB(A)		*LIMIT (µg/m3)
	Day Equivalent	Night Equivalent	
Core Zone	50.6	40.4	90
Buffer Zone	46.0 – 50.4	38.9 – 41.2	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.			
E) SOIL QUALITY		Monitoring Location – 3 locations	
PARAMETER		Range of values	
pH		6.99 to 7.24	
Electrical Conductivity (µmho/cm)		45.67 – 70.74	
Organic matter (%)		0.76 – 1.02	
Total Nitrogen (mg/kg)		125 - 245	
Phosphorus (mg/kg)		1.36 – 1.59	
Sodium (mg/kg)		354- 422	
Potassium (mg/kg)		586 - 704	
Soil is of Clay Loam type.			

3.2.2 LAND ENVIRONMENT:

Landuse pattern study carried out through remote sensing satellite data around the 10km buffer zone shows that 57.24 % of the study area constitute fallow land and Land with scrub..

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 grasses & bushes. The Dominated species in the buffer zone are Acacia auriculiformis, Acacia leucophloea Azadirachta indica, Prosopis juliflora, Borassus flabellifer, Acacia nilotica, Albizia lebbeck, etc.

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.



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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. 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 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 green netting around the lease periphery on all sides.
- Development of green belt/ plantation in various areas within the mine lease area etc.



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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 53.3 µg/m³ to 65.1 µg/m³ and with respect to PM_{2.5} are in the range of 26.8 µg/m³ to 33.1 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 seasonal odai channel located on the Western side of the lease for which 50m safety distance has been left. Earthen bund will be formed within the lease area. There is no proposal to discharge any effluent into this waterbody. No major impact is envisaged on the nearby water bodies due to project operations.



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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:

In the proposed mine workings, blasting & vibration effects will be controlled by adopting following measures.

- Carrying out controlled blasting using Nonel delay detonator.
- Optimum design for burden and spacing.
- Reducing explosive charge per delay to minimum.
- Using rock breaker wherever possible
- Proper care and supervision during blasting by a competent and experienced person to be carried out.
- Besides, different blasting time for both the projects is suggested and the timing is to be mentioned in the display board in the mines entrance.

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.



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4.1.5 IMPACT ON LAND ENVIRONMENT:

At the end of the 5 year period, 1.32.0 Ha will be used as mined out area at 17m depth. Subsequently, in the remaining 6th to 10th year there will be only depth ward mining in the same mined out area up to 47m depth. Ultimately the entire mined out area of 1.32.0 Ha will be left as water body. 0.05.0Ha will be the mine roads & Infrastructure and 0.09.0 Ha will be covered with vegetation, 0.11.17Ha will be undisturbed and 0.05.0 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:

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. 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 9 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.



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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 2 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. 17.04 Lakhs is allocated under capital cost. Besides, Rs. 14.83 Lakhs per annum is allocated as recurring cost. The baseline monitoring carried out for this project reflects the cumulative impact of this existing quarry.

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, 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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