EXECUTIVE SUMMARY

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT OF MULTI COLOUR GRANITE QUARRY

(As per EIA Notification, 2006 dated 14.09.2006 and amendments)

Category: B_1

Extent : 2.79.73 Ha
S. F. Nos. : 864/2(P), 3(P), 4(P), etc
Village : Alambadi
Taluk : Vedasandur
District : Dindigul

PROPONENT

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CONSULTANT

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1.Executive Summary

M/s. Shri Sai Sabari Enterprises of Multi Colour Granite Quarry over an extent of 2.79.73 hectare is located in S.F. No: 864/2(P), 3(P), 4(P), 5, 6(P), 9(P), 10(P), 12, 13Alambadi Village, Vedasandur Taluk, Dindigul District. The area is marked in the survey of India Toposheet No.58J/2. The area lies between northern latitude of10°44'25.52103" to 10°44'32.75594"N and eastern longitude from 78°03'47.24684" to78°03'54.13167"E. The mining plan was approved in favor M/s. Shri Sai Sabari Enterprises vide Rc.No.1555/MM2/2019, dated 27.02.2020.

As per the Environmental Impact Assessment (EIA) Notification dated 14th September 2006, the project falls under 1(a) mining of minerals, Category – B1 in view of lease area >5 and <100 Ha(Cluster). In view of the above the proponent submitted the online application to SEIAA/SEAC on 18.03.2020. The proposal has been placed in 156th STATE APPRAISAL COMMITTEE MEETING on 18.06.2020 and granted Terms of Reference vide Lr. No. SEIAA-TN/F. No.7529/SEAC/TOR-731/2020 dated 30.06.2020.

1.1 SCOPE OF THE PROJECT

The proposal for Environmental Clearance of Granite quarry of **M/s. Shri Sai Sabari Enterprises** requires EIA report as per Terms of Reference vide Lr.No. SEIAA-TN/F.No.7529/SEAC/TOR-731/2020 dated 30.06.2020

1.2 PROJECT DESCRIPTION

Table No 1. 1 Project Details

Project Details	
Proponent	M/s. Shri Sai Sabari Enterprises
Total Mine Lease Area	2.79.73 Hectares (Patta land)
Survey No.	864/2(P), 3(P), 4(P), 5, 6(P), 9(P), 10(P), 12, 13
Site Location	864/2(P), 3(P), 4(P), 5, 6(P), 9(P), 10(P), 12, 13
Geographical Co-ordinates	Latitude: 10°44'25.52103" to 10°44'32.75594"N Longitude: 78°03'47.24684" to 78°03'54.13167"E
Toposheet No.	58J/2
Elevation	223m above MSL
Accessibility	
Nearest Habitation	470 m - Southwest

Nearest Village	Alambadi – 1km West
Nearest Town	Karur- 20km-North
Nearest Roadway	NH- 7– Karur to Dindigul – 14.7 km – E SH 74- Karur to Dindigul – 7.4km- W MDR 418 –Palayam - Aravakurichi Road (MDR)– 1.12 km North Bodipatti Village Road – 915m Northeast
Nearest Railway station	Palayam Railway Station – 7.4 km East
Nearest Airport	Trichy Airport - 70km – East
Environmental Sensitiveness	
Interstate Boundary	Tamil Nadu- Kerala Interstate Boundary – 102km – West
Coastal Zone	Bay of Bengal – 143 m (SE) Hence the area does not attract the C.R.Z. Notification, 1991.
Reserve Forest	There is no Reserved Forest found around 10 km radius of lease boundary Hence the area does not attract the Forest Conservation Act, 1980.
Wildlife sanctuary	No wildlife sanctuary is located within 10km radius. Hence the area does not attract the Wildlife Protection Act, 1972.
Water bodies	Velliyanaikulam – 9.5 km – NE Kodavanar River – 10.6 km - W A weir near Pudumantapatti – 7.1 km NE A Weir near Talapatti – 7 km N
Habitations	Alambadi – 5335 people - 1.0km-W Chatrapatty - 3147 people - 1.0km-NW Mallapuram - 5933 people - 7.0km-S R.Vellodu - 3147 people - 4.5km-W Kottanatham - 2873 people - 4.4km-E Palayam - 15336 people - 7.7km-E Dhalipatti - 730 people - 5.6km-SE Chettiyur - 650 people - 1.0km-S Pappanayakanoor – 780 people - 3.7km-NW
Defense Installations	Nil within 10km radius
Quarries around 500m radius (AD Letter furnished)	Two Existing Quarries (4.96Ha), Two proposed (M/s. Shri. Sai Sabari Enterprises – 2.79.23 Ha &Tvl Ultratech cement – 15.95.0) and one expired quarry(0.77.0)are found around 500m radius AD Letter. No: Roc.No.171/2018/Mines dated 13.03.2020.

Seismic Zone	Zone-II, Low damage risk zone as per BMTPC, Vulnerability atlas Seismic zone of India IS: 1893-2002
Mining Details	
Method of Mining	Open Cast – Semi Mechanized Mining Method
Geological resources	335029 m^3
Mineable reserves	314334 $m^3$of Multi colour Granite
Production	4876 m^3 / annum of Multi colour Granite
Topsoil	11205m^3 for period of Plan
Granite Rejects @ 75%	73143 m^3 for 5 years
Depth of Mining	Total Depth of Mining – 28m bgl
Water Table	60-62m bgl
Overall Pit Slope	45°
Period of Lease	20 Years for Multicolour Granite
Project Cost	Rs47 Lakhs
EMP Cost	Rs 5Lakhs

2.0 Description of the Environment

2.1 Base line Environmental study

Collection of baseline data is an integral part of the preparation of Environmental Impact Assessment reports. The baseline monitoring study has been carried out during the winter season (December1st, 2019–February 29th, 2020) to assess the existing environmental scenario in the area. For the purpose of EIA studies, quarry lease area was considered as the core zone and area outside the quarry lease boundary up to 10 km radius from the lease boundary was considered as buffer zone.

Table No 1.2 Baseline Data

Particulars	Details	Standards
Meteorology (December 1st, 2019 –February29th, 2020)		
Rainfall (Avg.)	831 mm (yearly)	--
Temperature (Avg.)	19-35°C (Study period)	--
Wind speed	4.5 m/s	--
Wind Direction	From N, SW, S and NE	
Ambient Air Quality (NAAQS)		
PM_{10}	41-57 µg/m3	100 µg/m^3
$PM_{2.5}$	20-34 µg/m3	60 µg/m^3

SO_2	5-9 µg/m3	80 µg/m^3
NO_x	11-16 µg /m3	80 µg/m^3
Noise Level (CPCB Standards)		
Day time (6:00 am - 10:00 pm)	Core zone – 39.4 – 43.7 dB (A) Buffer zone –38.6- 41.6 dB (A)	**Industrial Area** Day Time - 75 dB (A) **Residential Area** Day Time – 55 dB (A)
Night time(10:00pm - 06:00 am)	Core zone – 35.1 – 37.3 dB (A) Buffer zone – 33.4-37.1 dB(A)	**Industrial Area** Night Time – 70 dB(A) **Residential Area** Night Time – 45 dB (A)
Water Quality IS 10500:2012 (Desirable limits)		
pH	7.83– 7.97	6.5 to 8.5
TDS	458 - 2916 mg/l	500 mg/l
$THCaCO_3$	281-1518 mg/l	200 mg/l
Soil Quality		
pH	6.76 – 6.94	slightly acidic
Bulk density	1.43-1.52 g/cc	Favorable physical condition for plant growth.
Hydro Geology		
Depth of Mining	28m bgl	
Water Table	60-62m bgl	

2.2 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

2.2.1 Air Environment

The air borne particulate matter is the main air pollutant by opencast mining. The mining operation will be carried out by adopting Manual methods which involves Jack Hammer drilling and blasting, excavation, loading and transportation. AERMOD was used for prediction of impact of PM10 during conditions) Loading/unloading and transportation of Granite by trucks on Haul roads ii) Blasting by using area source model to predict GLC of PM10 during these conditions. Total predicted 24-h maximum GLC of PM10 at project site for scenario 1 i.e. loading, unloading, transportation& open pit and scenario 2 i.e. Blasting was 88µg/m3 and 60µg/m3 respectively occurred at the project site after superposition of base-line value57 µg/m3 over the incremental GLC 31 µg/m3and 44 µg/m3 respectively due to

combined impact of loading, unloading, open pit and transportation over the haul road and due to blasting.

2.2.2 Noise Environment

Noise pollution poses a major health risk to the mine workers. The sources of noisein the proposed open cast granite quarry are such as Drilling, Blasting, and during movement of vehicles. The noise generated by the mining activity is dissipated within the core zone. This is because of distance involved and other topographical features adding to the noise attenuation. From the results, it can be seen that the ambient noise levels (day time and night time) at all the locations will remain within permissible limits prescribed by CPCB and 90dB (A) norms of DGMS. At present there is no mining activity carried out. However, the expected noise levels are not likely to have any effect. Precaution will be made to keep down the noise exposure level of 85 dB (A) to the operating personnel for 8 hrs duration. The charge per blast of 200kg is well below the Peak Particle Velocity below 5mm/s. However, as per statutory requirement additional control measures needs to be adopted to avoid the impacts due to ground vibrations and fly rocks due to blasting

2.2.3 Water Environment

Mining operations can affect groundwater quality in several ways. The most obvious occurs in the mining below the water table, either in underground workings or open pits. This provides a direct conduit to aquifers. Groundwater quality is also affected when waters (natural or process waters or wastewater) infiltrate through surface materials (including overlying waste or other material) into ground water. But this granite mine is devoid of any such impacts.

The impact due to mining on the water quality is expected to be insignificant because of no use of chemicals or hazardous substances during mining process. The water sample from core zone is good on both Physico-chemical analysis and biological testing. Then the water sample from both R.Vellodu and Mallapuram village is poor on Physico-chemical analysis. The water sample from Mallapuram village contains Total Coliform in the range of 33/100ml. But based on the Water Quality Index calculated, water quality in both core and buffer zone is good which is suitable for the drinking purpose. For the excellent quality of drinking the water must be treated with reverse osmosis process. The boiling of water will remove the microorganisms effectively.

2.2.4 Soil Environment

Soil characteristics indicate favorable condition for plant growth. The top soil generated for the entire life of the mine will be 11205m3. It is being used for plantation purpose.

2.2.5 Waste Dump

The top soil generated for the entire life of the mine will be 11205 m3. Top soil &weathered (32805 m3) shall be removed and stacked separately along lease boundary as earth bund which will be used for afforestation purposes. The proposed rate of production of Multicolour Granite is about 24281m3 for five years at the rate of 25% recovery up to permissible depth. The rejects of 75% is about 73143 m3. All the rejects shall be dumped barren area temporarily and back filled over the mined out area in future.

Description	Volume (m^3)
Top soil	11205 m^3
Reject/Waste (60 x 50m x 24.381 m)	73143 m^3
Total	92464 m^3

2.2.6 Biological Environment

There are no notified endangered species in the area, which may be affected due to the quarry activities; therefore the biological environment will not have significant impact due to quarrying activity. The impact on the biological environment due to amount of dust generation is minimized by well-developed green belt in and around the quarry lease area.

2.2.7 Land Environment

The Granite quarry project will result in disturbance of the land use pattern of the quarry lease area. The land degradation is unavoidable during quarrying activities like excavation, overburden dumping, soil extraction etc. So reclamation of quarried land and proper formation of benches will be given due importance. The land use analyses show that the area is of predominantly Agriculture followed by buffer zones of the study area, which clearly indicates that the development of agriculture land increases over a period of time. It is generally agreed that as the total volume of

production from year to year may increases. Some fallow land also increases due to seasonal crop production, which shows a positive impact due to quarrying activity.

2.2.8 Socio Economic Environment

The quarrying activity will definitely increase the employment opportunity (directly as well as indirectly) in the project area. Some of these impacts would be beneficial. The expectation of the people of area is concerned towards employment, education, road and health facilities. The literacy rate may be increased with the economic benefits which may arise from the quarrying activities.

Table 1.3 Environmental Management Plan

S.No	Parameters	Mining Activity	Mitigation measures
1	Air Environment	Drilling	✶ Dust extractor or wet drilling to be followed to control dust at source of emission ✶ Use of Sharp drill bits for drilling holes and charging the holes by using optimum charge and using time delay detonator
		Blasting	✶ Regular water sprinkling on blasted heaps at regular intervals will help in reducing considerable dust pollution
		Loading	✶ Water sprinkling be done before loading by making it moist
		Transportation	✶ Water sprinklers along the sides of haul road shall be fixed to control fly of dust while transporting minerals and waste ✶ Overloading will be prevented ✶ Trucks/Dumpers covered by tarpaulin covers
		DG Sets	✶ DG sets will be used only during power failure ✶ Adequate stack height for DG sets will be provided as per CPCB norms
		General measures	✶ Avenue trees along roads around ML boundary shall be planted as per the norms of MoEF to control fly of dust. ✶ Labours engaged in such dust prone areas should be provided with safety devices like ear muff, mask, goggles as per the MMR, 1961 amendments and circulars of DGMS. ✶ Regular health check–up of workers and nearby villagers in the impacted area should be carried out and also regular occupational health assessment of employees should be

			carried out as per the Factories Act ✶ Ambient Air Quality Monitoring will be conducted on regular basis to assess the quality of ambient air.
2	Water Environment	Surface water	✶ Wastewater discharge from mine will be treated in settling tanks before using for dust suppression and tree plantation purposes.
		Ground water	✶ The mining activity will not intersect the ground water table ✶ Desilting will be carried out before and immediately after the monsoon season
		Storm water	✶ Pit will be used for Storage of rainwater ✶ Rain water will be collected in sump in the mining pit and will be allowed to store and pumped out to surface setting tank of 15 m x 10m x 3m to remove suspended solids if any. This collected water will be judiciously used for dust suppression onwards and such sites where dust likely to be generated and for developing green belt. ✶ The proponent will collect and judicially utilize the rainwater as part of rain water harvesting
		General measures	✶ Regular monitoring and analyzing the quality of water
3	Noise	Drilling	✶ Limiting time exposure of workers to excessive noise

	Environment	Blasting	✶ Carrying out blasting only during day time and not on cloudy days ✶ Noise levels will be controlled by using optimum explosive charge, proper delay detonators and proper stemming to prevent blow out of holes. ✶ Providing proper noise proof enclosure for the workers separated from the noise source and noise prone equipment
		Transportation	✶ Proper and regular maintenance of vehicles, machinery and other equipments. ✶ The noise generated by the machinery will be reduced by proper lubrication of the machinery and other equipments. ✶ Speed of trucks entering or leaving the mine will be limited to moderate speed to prevent undue noise from empty vehicles. ✶ Adequate silencers will be provided in all the diesel engines of vehicles. ✶ Minimum use of horns and speed limit of 10 km/hr in the village area. ✶ It will be ensured that all transportation vehicles carry a valid PUC Certificates
		General measures	✶ Use of personal protective devices i.e., earmuffs and earplugs by workers, who are working in high noise generating areas ✶ Provision of Quiet areas, where employees can get relief

			from workplace noise. ✶ The development of green belts around the periphery of the mine to attenuate noise. ✶ Regular medical check–up and proper training to personnel to create awareness about adverse noise level effects.
4	Vibration	Blasting	✶ No deep hole blasting envisaged. ✶ Small dia shot holes are used for breaking boulders. ✶ Specific charge pattern has to be designed by proper trial vibration studies with varying charge ratios as per studies. ✶ If the vibration still exceeds the limit a long Trench to a depth of 6m may cut in the direction of wave's movement to break longitudinal waves which travel close to surface, preferably near mine buffer zone ✶ In spite of all measures periodical testing of vibration and noise using approved seismograph by DGMS has to be followed as a part of Environmental monitoring
5	Soil Environment	Topsoil	✶ Humus top soil shall be preserved for reuse in afforestation and agriculture ✶ Top soil should not be mixed with other waste or reject materials. It should be conserved by judicious utilization in the quarry premises ✶ Garland drains will be provided around the mine and dumps to arrest any soil from the quarry area being carried away by the rain water. This will also avoid the soil erosion and siltation in the mining pits and maintaining the stability

			of the benches
6	Waste Dump	Stabilization of Dumps	✶ The rejects\ waste dump shall be properly terraced in to 1.5m benches with proper repose angle and then the top soil shall be spread over the dumps and slope to make them humus for some time, after the soil suitable for water retention trees will be planted at the top, slope and toe of the stabilized dumps to form vegetation ✶ Garland drainage around dump shall prevent under wash of dump by hydrostatic pressure to be developed by surface water and control wash outs and collapse.
7	Plantation	Quarry lease boundary and waste dump	✶ Provision of green belt all along the periphery of the lease area for control of dust and to attenuate noise ✶ Stabilization of Dump with plantation ✶ It is strongly recommended that the loss of plant in each year will be counted and again planted in subsequent plantation. ✶ The plant should be planted taken from nursery, where the survival rate is high.
8	Land Environment		✶ The restoration of the degraded land would cover backfilling and terracing with the overburden / wastes and surfacing the same with top soil. ✶ Provision of Garland drainage around the dumps ✶ Fast growing trees and other native shrubs would be planted to stabilize the reclaimed land ✶ Appropriate measures will be taken for Green belt development.

			✶ The rain water will be stored in the pit which will recharge the ground water as a part of rain water harvesting scheme for irrigating the nearby agricultural lands.
9	Socio Economic		✶ Good maintenance practices will be adopted for machinery and equipment, which will help to avert potential noise problems. ✶ Green belt will be developed in and around the project site as per Central Pollution Control Board (CPCB) guidelines. ✶ Drilling, blasting etc at specified location will be followed with proper schedule. ✶ Appropriate air pollution control measure will be taken so as to minimize the environmental impact within the core zone. ✶ An emergency preparedness plan will be prepared in advance, to deal with firefighting, evacuation and local communication. ✶ For the safety of workers, personal protective appliances like hand gloves, helmets, safety shoes, goggles, aprons, nose masks and ear protecting devices has been provided which meet 'BIS' (Bureau of Indian Standards). ✶ As a part of CSR activities, community welfare activities will be undertaken by the proponent which leads to socio economic development
10	Occupational Health		✶ First-aid facilities as per provisions under Rule (44) of Mines Rules 1955

			✶ Initial and Periodical medical examination shall be conducted for the employees under Rule 29B & 45 (A). o Insurance will be taken in the name of the labourers working in the quarry ✶ Workers involved in quarrying work shall be provided protective equipment's such as Thick Gloves, Goggles, ear plugs, safety boot wears, etc…

3.0 Analysis of Alternatives

The quarrying site is dependent on the geology and mineral deposition of the area. Hence, this project is mineral and site specific and no alternative site considered for this project.

3.1 Environmental Monitoring Program

Success of any environmental management programme depends upon the efficiency of the organizational set up responsible for the implementation of the programme. Regular monitoring of the various environmental parameters is also necessary to evaluate the effectiveness of the management programme. Environmental Monitoring Programme will be conducted for various environmental components as per conditions stipulated in the Environmental Clearance Letter issued by SEIAA & Consent to Operate issued by TNPCB.

Table No: 1.4 Post Project Environmental Monitoring Program

S. No	Environment Attributes	Location	Monitoring		Remarks
			Duration	Frequency	
1	Meteorology and Air Quality	Continuous monitoring weather station in core zone/ nearest IMD station	24 hours	Monthly Once	Wind speed, direction, Temperature, Relative humidity and Rainfall.
2	Air Pollution Monitoring – $PM_{2.5}$, PM_{10}, SO_2 and NO_x	6 locations (One station in the core zone and at least one in nearby residential, area, one in the upwind, two station on the downwind direction and one in cross wind direction).	8 hours	Once in six months	Fine Dust Sampler and Respirable Dust Sampler
3	Water Pollution Monitoring	Mine effluents, Set of grab samples during pre and post monsoon for ground and surface water in the vicinity.	–	Once in six months	Physico–chemical, microbiological characteristics
4	Hydrogeology	Water level in open wells in buffer zone around 1km at	-	Once in 6months	Water level monitoring devices may be

		specific wells			used.
5	Noise	Mine Boundary, high noise generating areas within the lease and at the nearest residential area	24 hours	Monthly Once	Sound level meter
6	Vibration	At the nearest habitation (in case of reporting)	–	During blasting operation	Digital Seismograph
7	Soil	Core Zone and Buffer zone (Grab samples)	–	Once in six months	Physical and Chemical characteristics

4.0 Project Benefits

The proponent is very much conscious of their obligations to society at large. Under plantation program, it is suggested to develop green belt further all along the boundary of mining lease area. Apart from the green belts and aesthetic plantation for eliminating fugitive emission and noise control, all other massive plantation efforts will be executed with the assistance of experts and cooperation of the local community. The mining activity will create rural employment. In addition there will be indirect employment to many more people in the form of contractual jobs like construction of infrastructural facilities, transportation of Granite to destinations, sanitation, supply of goods and services to the mine and other community services, etc…The local population will have preference to get an employment. Part of the royalty is given to local bodies by the State Govt. for the welfare and development of the village. The proponent help in socio economic development of the village by providing education facilities to children's, procuring sports equipments, welfare amenities like drinking water to school, road facilities to villages and employment opportunities to nearby villagers. CSR budget is allocated as 2.5% of the profit.

5.0 Environmental Management Plan

The Environmental Management Plan (EMP) must be integrated into the process of quarry planning so that the ecological balance of the area is well maintained and adverse effects are minimized. EMP includes all preventive as well as mitigation measures to minimize the impacts on the environment. The Quarry Plan is for the production of Granite without deep hole drilling and heavy blasting. Only controlled

blasting is undertaken. Such limited quarrying activity is not likely to cause any impact adversely on the environment as far as pollution of air, water, land and noise is concerned.

6.0 Conclusion

As discussed, it is safe to mention that the project is not likely to cause significant impacts on the ecology and environment of the area, as adequate preventive measures will be adopted to contain the pollutants within permissible limits. The total operations shall be carried out with ease & minimum risk to the workers. The proposed Environmental Management Plan will keep the area in a safe environment with negligible impact on the environment. Plantation will substantiate the impact due to the quarrying activity. Quarrying activity will help in improving the socio–economic benefits in areas like Employment, Business, communication and infrastructure development.