

**Executive Summary**  
**For**  
**Tvl. S.J. Natural Minerals**  
**Karisalpatti Multi Colour Granite Quarry**  
**“B2” Category**

S.F.Nos	113/1A, 113/2A, 113/2B, 113/3A, 113/3B, 113/4B, 113/5B, 121/1A and 121/2A
Extent	7.56.5Ha
Village	Karisalpatti
Taluk	Sattur
District	Virudhunagar
Purpose	Environmental Clearance
Proposed Production	37,125 m <sup>3</sup> (Multi colored Granite)
Project Cost	Rs. 3, 43,75,000 /-

**PROPONENT ADDRESS**  
Tvl. S.J. Natural Minerals,  
Door No. 1259, Solai Colony,  
Sivakasi Taluk,  
Virudhunagar District,  
Tamil Nadu – 626 189  
Mobile No: +91 94431-36073, 94421-36928

**PREPARED BY**  
**M/s. Geo Exploration and Mining Solutions,**  
Accredited for Sector 1, 28 & 38 Category ‘A’  
Quality Council of India – National Accreditation Board for Education & Training, New Delhi  
Certificate No : NABET/EIA/1821/RA 0123

**1. INTRODUCTION –**

Tvl. S.J.Natural Minerals is a partnership firm applied for Multi Colour Granite quarry lease over an extent of 7.56.5 Ha in S.F.Nos. 113/1A, 113/2A, 113/2B, 113/3A, 113/3B, 113/4B, 113/5B, 121/1A and 121/2A in Karisalpatti village, Sattur taluk, Virudhunagar District, Tamil Nadu.

The extent of the individual lease is more than 5 Ha ie 7.56.5 ha, This EIA report is prepared to evaluate the environmental impacts of the project in line with the requirements of EIA notification SO 1533(E) dated 14.9.2006 and amendments made thereof.

The proposed production of Multicolour granite is 1,23,750m<sup>3</sup> of ROM (37,125m<sup>3</sup> of Multicolour Granite + 86,625m<sup>3</sup> of Granite waste) for five year mining plan period.

**Project Identification:-**

This is the opencast Mining project proposed to carry out in S.F.Nos 113/1A, 113/2A, 113/2B, 113/3A, 113/3B, 113/4B, 113/5B, 121/1A and 121/2A in Karisalpatti village, Sattur taluk, Virudhunagar District, Tamil Nadu.

**Statutory details:-**

- Applied for Granite quarry lease 03.08.2017
- Precise area communication letter given by the industries department, Secretariat, Chennai Dated 14.05.2018
- Mining plan approved by the Director of Geology and Mining, Guindy, Chennai Dated 09.07.2018
- Submitted application for Terms of Reference (ToR) on 13.07.2019
- ToR and issued vide Terms of Reference (ToR) Letter No. Lr No.SEIAA-TN/F.No.6642/SEAC/ToR- 642/2019, dated: 05.09.2019

**Identification of the project proponent :-****Proponent Address**

Tvl. S.J. Natural Minerals,  
 Door No. 1259, Solai Colony,  
 Sivakasi Taluk,  
 Virudhunagar District,  
 Tamil Nadu – 626 189  
 Mobile No: +91 94431-36073, 94421-36928

Tvl. S. J Natural Minerals is the partnership firm, Thiru. T. Palanivel Murugan is the Authorized signatory of this Mining project.

**2. PROJECT DESCRIPTION –****Project profile and Salient Features**

S.No	Particulars	Details
1	Name of the project	Karisalpatti Multicolour Granite quarry project
2	Project proponent	Tvl. S.J. Natural Minerals
3	Location of the project	S.F.Nos - 113/1A, 113/2A, 113/2B, 113/3A, 113/3B, 113/4B, 113/5B, 121/1A and 121/2A  Village - Karisalpatti Taluk - Sattur District - Virudhunagar
4	Co ordinates	Latitude between 09°16'25.14"N to 09°16'35.64"N Longitudes between 77°52'47.87"E to 77°52'58.68"E <b>Toposheet No</b> 58-G/15
5	Extent and Capacity	<b>Extent</b> 7.56.5 ha <b>Production Capacity</b> 1,23,750m <sup>3</sup> of ROM (37,125m <sup>3</sup> of Multicolour Granite and 86,625m <sup>3</sup> of Granite waste)
6	Topography and MSL	Almost plain topography 85m Above MSL

ENVIRONMENTAL SETTINGS		
7	Nearest Railway	Nalli Railway Station – 4.44km - East
8	Nearest Airport	Madurai Airport – 65.83km – North
9	Interstate boundary	Kerala Interstate boundary – 67.38km - West
10	Coastal zone	Bay of Bengal – 51.65km – South East
11	Reserved Forest	Nil within 10km
12	Wildlife Sanctuary	Grizzled Squirrel Wildlife sanctuary – 48.13 km – NW
13	Notified Archaeologically important places, Monuments	Nil in the study area
14	Local Places of Historical and Tourism Interest	Nil in the study area
15	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 10km radius
16	Defense installation	Nil within 10km radius
17	Seismic zone	Zone – II (Least Active)
<b>Project Detail: -</b>		
RESOURCES AND RESERVES		
S.No	Particulars	Details
1	Geological Resource	ROM = 6,48,725m <sup>3</sup> Granite Recovery 30%= 1,94,621m <sup>3</sup> Granite Waste 70% = 4,54,104m <sup>3</sup> Ore waste ratio = 1:13.2 Estimated depth = 38m
2	Mineable Reserves	ROM = 4,99,675m <sup>3</sup> Granite Recovery 30%= 1,49,903m <sup>3</sup> Granite Waste 70% = 3,49,772m <sup>3</sup> Ore waste ratio = 1:4.2 Estimated depth = 38m
3	Yearwise production (For this Mining plan period)	ROM = 1,23,750m <sup>3</sup> Granite Recovery 30%= 37,125m <sup>3</sup> Granite Waste 70% = 86,625m <sup>3</sup> Ore waste ratio = 1:2.7 Estimated depth = 13m

METHOD OF MINING AND MACHINERY DETAIL		
4	Method of Mining	Opencast Semi mechanized Mining
5	Bench height	5m height and 5m width
6	Name of the machinery	Hydraulic Excavator – 2 Nos Crane - 1 No Compressor 125kva - 1 No Diamond Wire saw - 2 Nos Jack hammer - 10 Nos

  

**LOCATION MAP  
(10Km Radius)**

**Name of the Mine :** Karisalpatti Multi Colour Granite Quarry  
**Extent of the Area :** 7,56.5 Ha  
**Village Name :** Karisalpatti  
**Taluk :** Sattur  
**District :** Virudhunagar

**Project Proponent :** Sri. S. J. Natural Minerals  
 Da. No-1259, Sela Colony  
 Sivakasi Taluk  
 Virudhun Nagar District

**Topo Sheet Index**

**Legend**

- ▲ Village
- Major District Road
- Railway
- State High Road
- NH
- DR
- District High Road
- Panchayat Road
- Mining Area
- Other Mines

**Source:**  
 Survey of India Topo Sheet No. 88G/11, 88G/16  
 Year: Edition 2011.

**Environment Consultant:**  
 MEN, Geo Exploration and Mining Solutions,  
 Sattur, Tamil Nadu.

<b>Drafted by</b>	<b>Checked by</b>

### 3. DESCRIPTION OF THE ENVIRONMENT –

Baseline data was generated for various environmental parameters including Air, Water (surface and groundwater), Land and Soil, Ecology and Socio-economic status to determine quality of the prevailing environmental settings. The Base Line Study was conducted during post-monsoon (October - December) season in 2019.

#### 3.1 Land Environment

##### Core zone:

The entire project area (Extent - 7.56.5ha) is own patta land, The entire project area is almost plain topography covered by thick overburden (Top soil 3m). There are no habitations, vegetation's, trees any other infrastructures within project area.

It is a dry barren land and agricultural activities are carried out by utilizing well water around the area (lift irrigation-seasonal vegetation is mostly practiced). Out of 7.56.5hec, Mine working covers only 2.35.4Hec and the rest of land for dumps, roads etc.,

Land use pattern (Core zone)

Description	Area to be required during present mining plan period (ha)	Area at the end of the life of quarry (ha)
Area under quarry	2.35.4	3.87.0
Waste dump	0.60.6	Backfilled
Infrastructure	0.05.0	0.05.0
Roads	0.03.0	0.05.0
Green belt	0.44.7	1.26.3
Stocking blocks	4.07.8	2.33.2
<b>Grand total</b>	<b>7.56.5</b>	<b>7.56.5</b>

##### Buffer zone

10km radius from the periphery of the project area is taken as buffer zone, Land use refers to “mans activity and the various use which are carried on land.” Land Cover refers to “natural vegetation, water bodies, rock/ soil, artificial cover and others resulting due to land transformation.”

Majority of the land covered in the study area is Agriculture Land – 56.7%, fallow land – 30.8%, Mining Area – 0.1% from this Total Mining area the project area covers 30%. Existing land use pattern of the project area is Dry Barren Land, own patta Land, No Forest Land is involved.

### 3.2 Soil Environment

The major part of the district is covered by black cotton soil. Loamy soil, alluvial soil, Sandy loam and Sandy clay are the soil types found in the district.

Five soil samples were collected, one in core zone and another four samples collected in the buffer zone. pH ranges from 7.69 to 8.61 and found to be Slightly alkaline to Strongly alkaline in nature. The soils collected from different location in the study area are Clay loam in texture. Water holding capacity was found between 38.8-45.2 %.

The soils with low bulk density have favorable physical conditions whereas those with high bulk density exhibit poor physical conditions for agriculture crops. The bulk density of the soil in the study area ranged between 1.07 – 1.35 g/cc. Organic carbon and available nitrogen shows good trend and is suitable for plantation.

### 3.3 WATER ENVIRONMENT –

The assessment of present status of water quality within the study area was conducted by collecting water from ground & surface water sources during the period of October - December .

Odai is located in the north east side of the S.F.No 119/2, 50m safety distance will be maintained from the odai.

Swaminathapuram oorani is located 29m west side of the area (S.F.No 114/2) 50m safety distance will be maintained from the odai.

There is no perennial source of surface water body in the core zone, Analysis of different Samples of ground water shows that all parameter are well within prescribed limit.

The water table in the area is 53m below the ground level, observed from the nearby borewells and geophysical resistivity survey. The proposed depth is well above the ground water table. Hence the quarrying operation will not intersect the ground water table

### Groundwater –

- The pH was varying from 7.12 to 7.77.
- The Calcium value was in the range of 81.6to 99.4 mg/l.
- The TDS values is ranging from 569 to 768mg/l
- Hardness values is ranging from 354 to 417mg/l

**Surface Water–**

- The pH was varying from 7.05 to 7.35.
- The Calcium value was in the range of 78.2 to 91.1 mg/l.
- The TDS values is ranging from 551 to 689 mg/l
- Hardness values is ranging from 321.5 to 328mg/l

Analysis of different Samples of ground water shows that all parameter are well within prescribed limit.

**3.2 Air Environment –  
Meteorology (Climate) –**

The annual mean minimum and maximum temperatures are 23.78 and 33.95° C respectively. The daytime heat is oppressive and the temperature is as high as 40.2° C. The lowest temperature recorded is of the order of 19.3° C. The relative humidity is on an average between 65 and 85% in the mornings. Humidity in the afternoon is generally between 40 and 70%. rainfall over the district varies from about 724 to 913 mm

**Air quality Monitoring -**

Ambient Air quality Stations were selected based on the Predominant downwind direction in respect to the project site. Six Ambient Air Quality Monitoring (AAQM) Stations were selected by considering the wind rose pattern for pre-monsoon season and the accessibility of the selected sites.

The monitoring is being carried out from 15<sup>th</sup> September, 2019 – 15<sup>th</sup> December, 2019 for the parameters such as PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>x</sub>, CO, O<sub>3</sub>, NH<sub>3</sub>, As, Ni, Pb, Bap & C<sub>6</sub> H<sub>6</sub>. Ambient air quality monitoring was carried out at a frequency of two days per week at each location for three months at 24 hours continuously.

S.No	Parameter	Result in µg/m <sup>3</sup> (98 <sup>th</sup> percentile value)	CPCB Standard
1	PM <sub>10</sub>	44.2	100
2	PM <sub>2.5</sub>	23.4	60
3	SO <sub>2</sub>	10.0	80
4	NO <sub>2</sub>	14.9	80

From the table it can be seen that the existing Ambient Air Quality levels for SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> are within the prescribed CPCB limits.



**3.3 Noise Environment –**

Noise level monitoring was carried out in 9 location (5 in core zone and 4 in buffer) Minimum and maximum noise levels recorded in core zone during day time were from 43.3 – 49.3 dB (A) Leq and during night time were from 37.6 – 42.3 dB (A) Leq.

Minimum and maximum noise levels recorded in buffer zone during day time were from 44.3 – 45.7 dB (A) Leq and during night time were from 38.6 – 40.0 dB (A) Leq. Thus the noise level for Industrial and Residential area meets the requirements of CPCB.

From the results, it can be seen that the Day equivalents and the Night equivalents were within the Ambient Noise Standards of Industrial / Commercial / Residential Area.

**3.4 Biological Environment –**

Ecological survey has been carried out to understand baseline ecological status, important floristic elements and fauna structure. There are No Schedule – I Species listed as per The Indian Wildlife (Protection) Act, 1972 or Threatened Species as per IUCN Red List noticed within the Study Area.

**Socio Economics –**

The buffer zone encompassing 10 km radius from the periphery of core zone consists of 46 villages within 10km radius from the study area.

The infrastructure and amenities available in the area denotes the economic well being of the region. The study area as a whole possesses an average level of infrastructural facilities. This area lacks higher level of amenities like higher education, health, drinking water and communication network.

This area needs more medical facilities as it has not even one maternity and child care centre. Though the area is well connected with road transport and communication facilities still more frequent bus service is required.

The socio-economic analysis of the Study Area shows that in terms of education and employment, the area is moderately developed. The overall socio-economic status of the target population is average in terms of literacy, Work Participation Rate etc., More attention and care should be given so that the needs and demand of the population of the study area can be fulfilled.

## **4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

### **4.1 Land Environment:**

In the Opencast Mining method, the major impact is Land Environment. The existing land use pattern of the area is dry barren land, no forest land is involved in this project. In the total extent of 7.56.5ha, about 2.35.4ha area is proposed for five years quarry activity which will have the impacts due to the quarrying activity. After end of the quarry, the pit will be backfilled and utilized for plantation.

There are no trees found in the project area at present. After the completion of the mining operation, the lease applied area will be utilized for plantation.

Plantation will be carry out on waste dump & remaining land. About 1.26.3 Ha of the total lease area will be covered under plantation by the end of life of mine. The quarried out pit will be partially backfilled and partially allowed to collect the rain water.

### **4.2 Water Environment**

The proposed depth for the mining operation is well above the water table, there is no intersection of surface water (streams, Canal, Odai etc..) within the study area.

Prevention of water flow to the odai and oorani located in S.F.No 114/2 (29m west side) and S.F.No 119/2 (North East side)

#### **Mitigation Measures –**

- Peripheral Garland drain with silt trap will be constructed around the project area to divert the water flow into the natural gradient.
- The silt trap will be cleaned weekly in the monsoon period and monthly once in the non monsoon periods
- Internal garland drains around the quarry pit to prevent the rain water entering into the pit, the rain water will be collected in the lower part of the area and it will be used for afforestation and water sprinkling on haul roads
- Construction of check dams / gully plugs at strategic places to arrest silt wash off from broken up area.
- No toxic chemicals are involved. Domestic sewage will be collected in septic tank with soak pit.

### 4.3 Air Environment–

The air borne particulate matter generated by mining operations and transportation is the main air pollutant. The emissions of Sulphur Dioxide (SO<sub>2</sub>), Oxides of Nitrogen contributed by vehicles plying on haul roads will be marginal.

The Predicted maximum Ground level concentration of 24 Hour average of particulate matter concentration is superimposed on the maximum baseline concentration obtained during the study period to estimate the post project scenario, which would prevail at the post operational phase.

The 98<sup>th</sup> percentile value of PM<sub>10</sub> is 44.2µg/m<sup>3</sup> – and PM<sub>2.5</sub> is 23.4. This shows that the adverse impact of mining outside the ML area is marginal and has no adverse effect on health of human and animals and also on the flora of the area.

#### **Mitigation Measures –**

- Using diamond wire saw for granite cuttings and sharp drill bits for jackhammer drilling
- Water spraying on working face to control dust emission from loading & handling operations
- Water sprinklers along the mine haulage roads to reduce dust generation during plying of HEMM
- Periodic water sprinkling on waste dumps and haul roads to minimize dust emissions.
- Avoiding of overloading of tippers and covering of loaded tippers with tarpaulins during ore transportation
- Greenbelt development will be carried out to arrest the dust particles.
- Periodical monitoring of air quality to take steps to control the pollutants
- Ambient Air Quality Monitoring will be conducted on regular basis to assess the quality of ambient air as per the proposed monitoring plan.

#### **4.4 Noise Environment**

Noise pollution is mainly due to the Operation of machineries and Occasional plying of tippers in the mines.

The nearest population is in Karisalpatti village at about 2.20 Km from the project site. Continuous noise levels beyond the prescribed standards can however have impact on fauna. These can also have an impact on workers.

##### **Mitigation Measures –**

- In the high noise intensity working areas, earmuffs or earplugs or any other suitable personal protective equipment will be provided to the workers.
- Regular noise level monitoring shall be done periodically for taking corrective action.
- Greenbelt development around the mine site, office buildings and all along the internal road will be practiced as to create a barrier between the source and the receiver so that the noise is absorbed and the exposure level is minimized.

#### **4.5 Biological Environment**

The impact on biodiversity is minimal as there are no forest, wild life sanctuaries, and Eco sensitive zone within the radius of 10 KM.

The impact would be due to emission of gaseous pollutant from HEMM. Adequate dust control measures will be taken to control dust emission. Thick Greenbelt development will be carried out in the mine area and haul roads to control the dust emission. Besides the air quality standards for PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub> and NO<sub>x</sub> are within the AAQ standards.

#### **4.6 Socio Economic Environment.**

Due to this mining activity 41 numbers of skilled and unskilled workers are benefitted through direct employment. About 100 numbers of peoples will be get employment opportunities indirectly. Additional facilities such as medical, educational and infrastructural development will also take place under CSR/CER activities.

Considering the socio – economic and sociological impact it is concluded that the economic level and living standard of the people will generally increase.

**5 ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)****Site Alternatives –**

No alternative site has been proposed as multi colour granite occurrence is site specific in nature and the location of the proposed project is restricted to the geology and mineral deposition of the area.

**Mining Technology alternatives –**

Mining will be carried out through Opencast mechanized method, as it is more economically viable, and preserves the conservation of minerals and environment. Unlike other industries, the project cannot be shifted to other sites.

The project will follow opencast mining method because of surface mineral deposits and to ensure higher mineral conservation. The mining by opencast method will be highly productive & economical as compared to underground method.

**6 ENVIRONMENT MONITORING PROGRAM –**

Usually an impact assessment study is carried over short period of time and the data cannot bring out all variations induced by natural or human activities. Hence regular monitoring program of Environmental parameters is essential to take into account the changes in the Environment. The Objective of Monitoring -

- To check or assess the efficiency of the controlling measures;
- To establish a data base for future impact assessment studies.

**7 ADDITIONAL STUDIES - RISK ASSESSMENT & HAZARD –**

The components associated with risk and hazard in this mining case include, waste dump and heavy earth moving machinery. Measures to reduce and avoid any incidents occurring from the above-mentioned components shall be planned and implemented as soon as the mine starts commissioning; this includes measures to avoid the above discussed risk factors. Proper risk management plan will be proposed to avoid any kind of accident/ disaster.

**8 PROJECT BENEFITS –**

This Multicolour Granite quarry project falls in the area of Virudhunagar District, Tamil Nadu where scanty agricultural activities are been carried out and the new industries are springing up in the district.

The area applied for mining lease is devoid of any major industries and agricultural activities. The earning source in the targeted area is limited, most of the people in and around the area depend upon the seasonal agriculture and much of the people migrate to nearby towns where good number of industries and factories are growing up.

This project will provide direct for about 41 persons and indirect employment for 100 peoples in various sectors like transportation and mineral processing etc., Mineral Industries of the state of Tamil Nadu provides employment opportunities for the people of the state as well as in the specific project area.

- Improvement in physical infrastructure
- Improvement in Social Infrastructure
- Employment Potential
- Proponents will carry out CSR activities like community awareness program, health camps, Medical aid, family welfare camps etc.,
- A massive plantation will be carry out in the mine area to mitigate the ill-effects of mining and to improve the vicinity and environment of mine and its surrounding area.

**9 ENVIRONMENTAL COST BENEFIT ANALYSIS.**

Environmental cost benefit analysis is not recommended.

**10 ENVIRONMENT MANAGEMENT PLAN –**

The proponent shall organize an Environment Monitoring Cell which is responsible for the management and implementation of the environmental control measures. Basically, this department shall supervise the monitoring of environmental pollution levels like Ambient Air quality, Water quality, Soil quality and Noise level by appointing approved external agencies.

**Occupational Health and Safety:-**

The working condition in the quarry is governed by the enactments of the Director General of Mines Safety (DGMS). Necessary precautions regarding health and safety of workers will be strictly followed as per the guidelines of the Mines Act, sanitary facilities will be provided within the project area and periodic health check-up will be carried out to all the workers.

**11 CONCLUSION –**

It can be concluded from overall assessment of the impacts, in terms of positive and negative effects on various environmental components, that the mining activities will not have any adverse effect on the surrounding environment.

To mitigate any impacts due to the mining activities, a well-planned EMP and a detailed post project monitoring system is provided for continuous monitoring and immediate rectification at site. Due to the mining activities, socio economic conditions in and around the project site will be improved substantially. Hence, the Environmental Clearance shall be granted at the earliest.

