



EXECUTIVE SUMMARY

FOR PROPOSED BLACK GRANITE QUARRY

State : Tamil Nadu District : Dharmapuri
Taluk : Palacode Village : Sudanur
SF No : 1 Extent : 30.10.5Ha
Land Classification : Government Poramboke
land
Production capacity : 79,004 M³ RoM/annum

**Project Schedule under 1(a) Mining of Minerals 'B1' category as per EIA
Notification 2006 and its Amendments**

Project Proponent



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EXECUTIVE SUMMARY

1. INTRODUCTION

M/s. Tamil Nadu Minerals Limited (An Undertaking of Government of Tamil Nadu) has been established in the year 1978 to carryout systematic mining and development of different minerals all over the state. Ever since its inception, TAMIN has developed expertise in the mining of granite dimensional stones of different varieties including black granite (Dolerite), Kashmir white (Leptynite), Paradiso (Migmatite gneiss), Green onyx (Syenite - porphyry) Red wave (Pink Feldspathic gneiss) Colombo Juparana (Pegmatitic granite gneiss of migmatitic origin), Raw silk (Yellow Feldspathic Leptynite) and a number of other coloured granite varieties apart from other industrial minerals viz. quartz and feldspar, graphite, lime stone, silica sand, vermiculite, etc. TAMIN has also set up industrial units for polishing the granite stones one each at Manali, Chennai and Madhepalli at Krishnagiri District respectively. A Beneficiation plant for the beneficiation of graphite ore has been established close to Sivaganga graphite mine. An exfoliation plant for the processing of vermiculite mineral at Sevathur village , Tirupathur District has also been established. Further, TAMIN is the only Organization recognized by Bureau of Indian Standard for manufacture and supply of I.S. Sand all over the country.

TAMIN applied for fresh grant of quarrying lease for quarrying Black Granite over an extent of 30.10.5 Ha. in S.F. No.1 of Sudanur Village, Palacode Taluk, Dharmapuri District, Tamil Nadu State for 20 years. The Government of Tamil Nadu issued the precise area communication letter to furnish the approved Mining Plan under Rule, 8-C(3b) of Tamil Nadu Minor Mineral Concession Rules, 1959 vide letter No. 12829/MME.1/2017 – 2, dated 17.12.2018. The Mining Plan was approved by the Directorate of Geology & Mining, Chennai vide letter Rc. No. 5909/MM5/2017, dated 02.02.2019.

As per Environmental Impact Assessment Notification, dated 14thSeptember 2006 and 14.08.2018 and its subsequent amendments from time to time, this project falls under **“1(a) Mining of Minerals.** As this is



new quarry and total extent of lease area is 30.10.5ha it categorized as 'B1' and green field. Hence, EIA, EMP along with Public Hearing has to be conducted for obtaining Environmental Clearance (EC) from State Environmental Impact Assessment Authority. In order to assess the environmental impacts due to the proposed project, Environmental Impact Assessment (EIA) report has been prepared.

Table 1: Project Summary & Salient Features within 15km radius of the lease area boundary

S.No	Particulars	Details
1	Latitude	12°28'34.51"N to 12°28'49.15"N
2	Longitude	77°59'52.04"E to 78°00'28.64"E
3	Site Elevation above MSL	≈730 AMSL
4	Topography	Hilly terrain
5	Land use of the site	Government Poramboke land
6	Survey No.	S.F.No.1
7	Topo Map	57L/3 & 57H/15
8	Location	Sudanur village, Palacode Taluk, Dharmapuri District, Tamil Nadu State.
9	Extent of lease area	30.10.5 Ha.
10	Quarry Lease period	20 Years
11	Peak yearly production capacity	79,004 M ³ of ROM Black Granite per Annum and 3,950 M ³ of recoverable production of granite per annum
12	Updated Mineable reserves	15,86,568 M ³ of ROM (79,328 M ³ of recoverable reserves)
13	Waste generation	Granite Waste: 3,75,143 M ³ ; O.B: 1,43,742 M ³ for 5 years
14	Granite waste ratio	1: 1.46(M ³ : M ³)
15	Method of mining	Semi Mechanized Open Cast mining
16	Bench parameters Bench Height & width Bench slope	6m & 6m Vertical slope is proposed
17	Life of Mine	20 Years subject to the continuous mining operation / Production
18	Water Requirement & Source	Water Requirement: - Drinking water & Domestic purpose : 0.5 KLD



S.No	Particulars	Details
		Wire Saw cutting : 0.3 KLD Dust suppression: 0.3 KLD Green belt:0.4 KLD Total: 1.5 KLD Source : From vendors and Sudanur Village Panchayat
19	Manpower	Direct: 35 , Indirect about 20
20	Project Cost	100 Lakh
21	Nearest highway	NH 7 : 19 Km, NE NH 66 : 25 Km, NE NH 46 : 46 Km, NE SH : 2 Km, E SH : 5.15 Km, NE
22	Nearest railway station	Marandahalli Railway station : 4.65 Km (NE) Royakottai Railway station : 9.75 Km (SE)
23	Nearest airport	Salem Airport : 77.09 Km, SW
24	Nearest town / city	Town: Royakottai, 9.75km (SE)
25	Reservoir/Lake/River/Sea	Seasonal odai, within lease area, SW Chinnar river, 5 Km, SW Panchapalli Dam, 7.10 Km, W
26	Reserved/Protected Forests	Udedurgam R.F : 4.90Km, NW
27	State Boundary	Karnataka State Boundary is 25.43km, NW
28	National parks/Wildlife Sanctuaries	Cauvery North wild life sanctuary is located in 7Km, SW direction.
29	Archaeological Important Places	Nil with 10 km Radius
30	Defense Installations	Nil with 10 km Radius
31	Nearest Port	Nil with 10 km Radius
32	Seismic Zone	Zone-III (Least Active)

1.1 Environmental Sensitive Areas

Cauvery north wild life sanctuary is located in 7Km, SW from the quarry site. There is no State and National boundary within the 15km from the mine lease boundary. Project doesn't attract the special conditions and general conditions as per EIA Notification.



1.2 Project Location

The applied Mine Lease area over an extent of 30.10.5 ha is covered within the survey of India Topo sheet No. 57L/3 & 57H/15 on a scale of 1:50,000 and it lies in latitude of 12°28'34.51"N to 12°28'49.51"N and longitude of 77°59'52.04"E to 78°00'28.64"E. Site Elevation is above 730m AMSL.

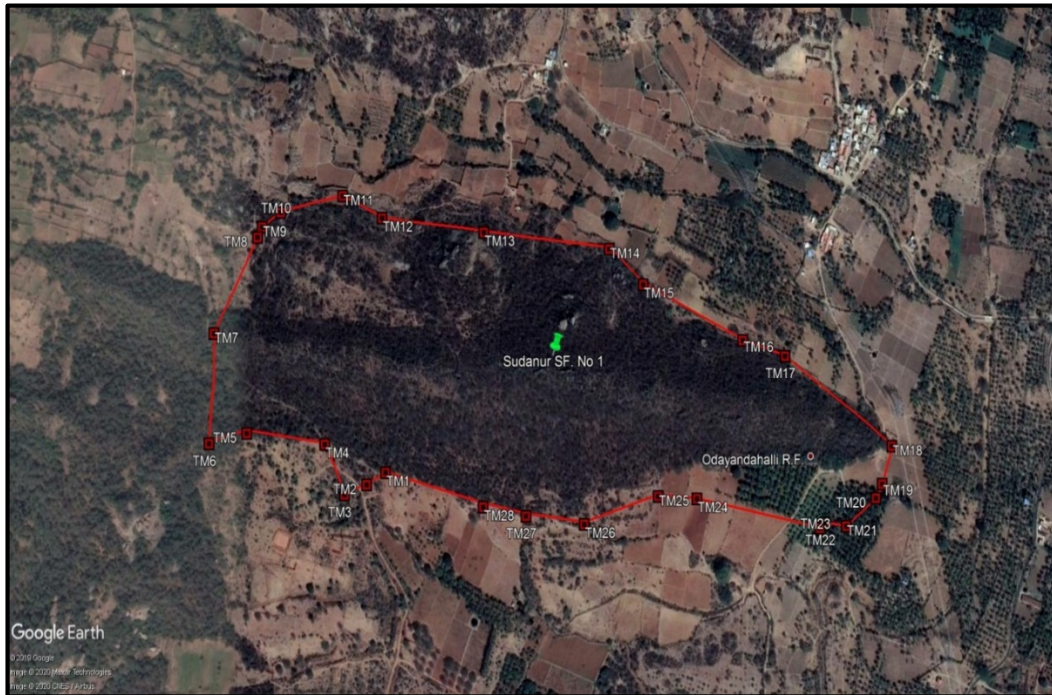


Figure 2 Google Imagery of the lease area boundary

2 PROJECT DESCRIPTION

2.1 Method of Mining- Open cast Working

The black granite quarrying operation is proposed to carry out by opencast semi mechanized mining with 6m vertical bench with a bench width of 6m has been proposed. The safety distance of 7.5m and 10 m will be left out to the adjoining Patta and Poramboke lands respectively along the boundary of the applied area and during the entire period of lease.

Under the regulation 106(2) (a) of the Metalliferous Mines Regulations, 1961, in all open cast workings in the hard ore body, the benches and sides should be properly benched and sloped. The bench height should not exceed 60° from horizontal.

Hence, it is proposed to obtain relaxation to the provisions of the above regulation from the Chief Inspector of Mines, for which necessary provision is



available within the Regulation 106(2) (a). The production of Black granite dimensional stone in this mine involves the following methods typical for granite stone mining, in contrast to any other major mineral mining.

- 1) Splitting of rock mass of considerable volume from the parent sheet rock carefully avoiding any kind of damage in the form of cracks adopting the following methods.
 - a) Diamond wire cutting along the horizontal as well as two vertical sides parallel to strike and dip direction and the third vertical face will be a free face is liberated by conventional serial blasting.
 - b) Separation of the horizontal (bottom) and the vertical (length side) planes by serial blasting simultaneously along the above two planes by using 32mm dia. blast holes charged with mild explosive like gun powder or detonating cord. The process continued aiming at the liberation of huge volume of the granite body from the parent sheet rock is called Primary Cutting.

All the above process continued together aiming at the liberation of huge volume of the granite body from the parent sheet rock is called 'primary cutting'.

- 1) The secondary splitting into required size involves long hole drilling up to the bottom of the separated block and mild blasting along the required plans.
- 2) Now-a-days the secondary splitting is carried out by the way of splitting and overturning cushion operational procedure. The procedure is by utilizing the compressed air available at the quarry at 7 to 8 bar pressure, initially (widening) splitting up to 15 to 18cms. Next by using super imposed cushion widening up to 80cms and overturning of the blocks.
- 3) Removing the defective portions and dressing into the dimensional blocks are done manually using feather and wedges and chiseling respectively by the labour that are skilled in this work.



2.1.1 Year-Wise Production for the First Five Years

In the mining lease area only 30.10.5 hectare area is available for mining and the Proposed RoM production capacity is around 3,94,887 M³ for five years and in that about 39,488.7M³ of recoverable production of granite per annum.

The year wise quantum of work proposed and the details of estimation of production quantity and generation of waste are furnished with reference to the year wise development/production plan.

Table 2- Year-Wise Production for the First Five Years

Year	Section	ROM (M ³)	Recovery @ 5% (M ³)	Granite waste @ 95 % (M ³)	Over Burden & Side Burden
I	PQ-AB	78,934	3,947	74,987	45,363
II	PQ-CD	79,004	3,950	75,054	54,779
III	PQ-EF	78,986	3,949	75,037	30,583
IV	PQ-GH	78,988	3,949	75,039	31,974
V	PQ-JK	78,975	3,949	75,026	38,875
Total		3,94,887	19,744	3,75,143	2,01,574

- Total Proposed ROM: 3,94,887 M³
- Total Recoverable Reserves @ 5 %: 19,744 M³
- Granite Waste @ 95%: 3,75,143 M³
- Over Burden / Side Burden: 2,01,574 M³
- Granite: Waste Ratio: 1:1.460 [5,76,717 / 3,94,887 = 1.460M³]

Table 3- Mineable Reserves

S. No	Cross Sections with reference to conceptual plan	Strike Length considered in M (Based on Influence of Section)	Ave. Width (in M)	Ave Depth (in m)	Total Institute Reserves (in M ³)	% of Recovery	Effective Reserves (in M ³)
PQ & AA', BB', CC', DD', EE', FF', GG', HH', JJ', KK', LL', MM' & NN'							
1	I st Bench	1,000.00	60.00	3.00	1,80,000		
2	II nd Bench	998.00	60.00	6.00	3,59,280		
3	III rd Bench	986.00	60.00	6.00	3,54,960		
4	IV th Bench	974.00	59.80	6.00	3,49,471		
5	V th Bench	962.00	59.40	6.00	3,42,857		
a) Total Mineable Reserves					15,86,568	5%	79,328
b) Depletion of Reserves before mining plan					Nil		Nil



S. No	Cross Sections with reference to conceptual plan	Strike Length considered in M (Based on Influence of Section)	Ave. Width (in M)	Ave Depth (in m)	Total Institute Reserves (in M ³)	% of Recovery	Effective Reserves (in M ³)
period							
c) Updated Mineable Reserves					15,86,568	5%	79,328

2.2 Project Requirements

2.2.1 Land Requirement

The total extent area of the lease for this quarry is 30.10.5 Ha at S. F. No. 1, located at Sudanur village, Palacode Taluk, Dharmapuri District. Quarry Land is classified as Government Poramboke land and leased to Tamil Nadu Minerals Limited (TAMIN).

Table 4- Land use Pattern of the Quarry

Description	Present Area (Ha.)	Area to be required during the mining plan period (Ha.)	Area at the end of life of the quarry (Ha.)
Area under Quarry	Nil	3.43.0	10.08.5
Waste Dump	Nil	4.65.5	14.83.5
Infrastructure	Nil	0.01.5	0.01.5
Road	0.08.0	Nil	0.20.5
Green Belt	Nil	0.10.0	1.50.0
Un-utilized Area	30.02.5	21.82.5	3.46.5
Total	30.10.5	30.10.5	30.10.5

2.2.2 Man Power Requirement

As per MMR 1961, Mines officials & other competent persons are deployed for effective supervision of mines. Mostly supervisors & skilled persons are required for looking after various aspects of operations including mining, loading & quality control etc. Details of manpower deployed in mine are as given below in Table-5

Table 5- Manpower Requirement

S.No.	Designation	No's
1.	Manager (Second class Manager certificate of competency restricted)	1
2.	Mine Foreman	1
3.	Operators & Drivers	7



4.	Workers (Skilled, semiskilled & unskilled)	26
Total		35

2.2.3 Water Requirement

Total water requirement for the mining project is 1.5 KLD. Total water required for the mine will be met from tankers. Water will be required for the Domestic purpose, Dust Suppression & Green belt development etc.

Table 6- Manpower Requirement

S.No.	Description	Quantity (KLD)
1	Drinking and domestic	0.5
2	wire saw cutting purpose	0.3
3	Dust suppression	0.3
4	Green belt/plantation	0.4
Total		1.5 KLD

2.2.4 Solid Waste Management

Total Solid waste generation is 14 Kg/day. The Biodegradable waste of 8.4 Kg/day which will be disposed to the local municipality and the about 5.6Kg/day of non-biodegradable will be disposed to the PCB authorized vendors.

2.3 Project Cost

Project cost of the project is shown in Table 7.

Table 7- Project cost of the project

S.No	Description of the Cost	Cost in Lakhs
I. Fixed Asset Cost		
1	Land Cost (Lease)	Nil (Govt. land)
	Labours Shed	50,000
	Sanitary facilities	50,000
	Fencing Cost	1,25,000
	Sub Total	2,25,000
II. Variable cost		
1		Operational Cost
	Machineries	95,67,000
	Sub Total	95,67,000
	EMP Cost	



2	Afforestation	30,000
	Water Sprinkling	50,000
	Water Quality Test	25,000
	Air Quality Test	25,000
	Noise/Vibration Test	25,000
	Sub Total	1, 55, 000
3	CSR Activities	50,000
Grand Total		99,97,000/ @ Rs. 1 Crore

3 BASELINE ENVIRONMENT

3.1 Meteorological Environment

The micro-meteorological conditions during the study period for hourly data of wind speed, wind direction and temperature were recorded at the project site. The nearest Indian Meteorological Department (IMD) station is Salem, the annually determined wind direction during the December, January & February is East.

During the study period (December 2019 – February 2020), maximum temperature is 37°C. Minimum temperature is 20°C. Relative humidity is 24 % to 96 %. Average wind speed in study period is 3.1 m/s, predominant wind direction is from East.

3.2 Ambient Air Quality

Maximum concentrations of PM₁₀, PM_{2.5}, SO₂, NO₂, CO, Pb, O₃, NH₃, C₆H₆, C₂₀H₁₂, As, Ni, are well within the National Ambient Air Quality Standards at all monitoring locations during the study period. The ambient air quality has been monitored at six (6) locations for 12 parameters as per NAAQS, 2009 and free Silica within the study area. The average baseline levels of PM₁₀ (31.2 to 54 µg/m³), PM_{2.5} (14.8 to 29.8 µg/m³), SO₂ (<5 µg/m³ to 7.5 µg/m³), NO₂ (<5 to 13.9 µg/m³), CO (<0.1 to 0.17mg/m³), O₃ (<5 to 11.1 µg/m³) were observed within the study area. Others parameters were Below Limit of Quantification. All the parameters are well within the National Ambient Air Quality Standards at all monitoring locations during the study period.



3.3 Noise Quality

The existing ambient noise levels were monitored using precision noise level meter in and around the project site at 10 km radius at 6 locations during study period.

- Within the mine area, day time noise level was about 43.6 dB(A) and 38.9dB(A) during night time, which is within prescribed limit by MoEF&CC (55dB (A) Day time & 45 dB(A) Night time).
- In other monitoring locations, day time noise levels varied from 42.7dB (A) to 53.1dB(A) and night time noise levels varied from 37.4dB(A) to 43.8 dB(A) across the sampling stations. The field observations during the study period indicate that the ambient noise levels in residential area are within the limit prescribed by MoEF&CC (55 dB(A) Daytime & 45 dB(A) Night time).

3.4 Water Quality

The water quality status at 1 locations for surface water and 6 locations for ground water were assessed.

Surface water quality:-

Water sampling results are compared with Surface water standards IS 2296:1992. The results indicate that the pH ranges between 7.84, TDS ranges from 172mg/l. The total hardness ranges from 80 mg/l, BOD ranges from <2 mg/l, COD ranges from 8 mg/l and DO ranges from 6.8 mg/l. The concentration of heavy metals within detectable limits and within the limits of IS2296:1992.

Ground water Quality:-

Water sampling results are compared with IS 10500:2012 standard. The results indicate that the pH ranges between 7.52 to 7.88, TDS ranges from 327 to 1610 mg/l. Total alkalinity in ground water samples ranges from 190 mg/l to 350 mg/l, sodium content in ground water samples ranges from 40 mg/l to 240 mg/l and Potassium content in ground water samples ranges from 1.5 mg/l to 5.8 mg/l. The heavy metals concentrations in the study area samples are below detection limits and all are well within the limits.



3.5 Soil Quality:-

Soil sampling was carried out at six (6) locations within the study area. It has been observed that the pH of the Soil ranging from 6.71 to 7.41 indicating the moderate and ideal of plant growth properties. The soil is predominantly of loam type and clayey loam in some locations. The concentration of nitrogen is in the range of 248kg/Ha to 378kg/Ha, the value of phosphorus content varies between 116.8 kg/Ha to 33.6kg/Ha and the Potassium ranges between 232 kg/Ha to 372 kg/Ha, which indicate that, the soil in the Study area shows moderate fertility and ideal for plant growth.

3.6 Ecological Environment

Cauvery North Wildlife Sanctuary is located in 7Km, SW from the project site. The area did not record the presence of any critically threatened species. The floral diversity is grouped into trees, shrubs, climbers, herbs, aquatic plants and phytoplankton. Similarly, the faunal diversity is grouped into mammals, birds, reptiles, amphibians and zooplankton. The study area has good vegetation cover in the western and northern western regions. Large tracts of the land are under paddy, sugarcane, and coconut and groundnut cultivation.

3.7 Socio economic Environment

The baseline data includes the socio economic status of the area. The data about the human settlements in and around the project site, health status of the community, existing infrastructure facilities for social welfare, job opportunities, safety and security of the workers and the surrounding population. Total population in the study region (Census 2011) is worked out as 1, 20,607 out of which 6, 19,277 are male and 58,680 female. The literacy rate of the total population is worked out to 52,877(45.74%). Male literacy 3, 52,524(26.96%) and female literacy is 20,353(16.87%) and the total population of main worker 55,176(33.79%) and non-worker category are 26,705(27.79%)



4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.1 Air Environment

The emissions mainly generated from the mining activities are blasting, drilling, scrapping, excavation, loading, unloading, and transportation etc. Machinery like compressors and jackhammers are used for drilling. Fugitive dust control in mine is given in Table 8.

Table 8- Fugitive dust control in mine

S.No	Activities	• Best practices
1	Drilling	<ul style="list-style-type: none">• Drills should be provided with dust extractors (dry or wet system)
2	Blasting	<ul style="list-style-type: none">• Water spray before blasting• Water spray on blasted material prior to transportation• Use of controlled blasting technique
3	Transportation of mined material	<ul style="list-style-type: none">• Covering of the trucks/dumpers to avoid spillage• Compacted haul road• Speed control on vehicles• Development of a green belt of suitable width on both sides of road, which acts as wind break and traps fugitive dust

4.2 Noise Environment

Noise will be generated during drilling, blasting and transportation processes. However, the noise is not anticipated to affect any of the surroundings since there is no habitation within 1Km nearby vicinity. The advancements in blasting techniques are also expected to bring down noise levels further. All mining operations including blasting processes will be done during the day time to avoid disturbing any of the local communities surrounding the mining site.

4.3 Water & wastewater Management

The accumulation of water inside the mines would be mainly due to the surface water entering the mines during rainy season. A pump will be installed & pumping will be done to dewater the mine seepage. The excess water pumped out during rainy season will be discharged into the nearby water course. During rest of the year, the water accumulated in the mine



sump area would be utilized for green belt development & for dust suppression measures.

Sewage (0.4 KLD) is being sent to septic tank followed by soak pit. The septic tank will be cleaned regularly. There is no process effluent generation in quarry project.

4.4 Biological Environment

To reduce the adverse effects on flora/fauna in mine area due to deposition of dust generating from mining operations, water sprinkling and water spraying will be ensured in all dust prone areas to arrest dust generation.

4.5 Solid/ Hazardous Waste Management

Municipal solid wastes including food waste are being disposed to municipal bin.

4.6 Occupational Health & Socio economic Environment

Impacts to health can be caused due to exposure to dust in large quantities or accidents that happen during the mining processes like drilling, blasting etc. The impacts can be nullified if safety measures like personnel protection equipment are worn and adequate safety procedures are followed during the mining operations. In terms of socio-economic impacts, there will be a positive impact since jobs will be created for the local community.

5 ENVIRONMENTAL MONITORING PROGRAMME

During the operation of mining, it is important in terms of evaluating the performance of pollution control equipments installed in the project. A monitoring schedule with respect to Ambient Air Quality, Water & Wastewater quality, Noise quality as per Tamil Nadu State Pollution Control Board (TNPCB) will be maintained.

6 ENVIRONMENTAL MANAGEMENT PLAN

The Environmental Management Plan (EMP) for the proposed mining operation has to ensure that the residual environmental impacts are minimized, by adopting best possible economically viable techniques. The environmental Management Plan during the operation of the mine shall be directed to the following:



- It should be ensured that all the pollution control/environment management systems are commissioned as part of main equipments, before the commencement of operation.
- Regular monitoring of various components of environment should be undertaken to ensure effective functioning of pollution control measures as well as to safeguard against any unforeseen changes in the environment.
- The recommendations for Disaster Management Plan / Occupational Health and safety Plan should also be implemented along with the commissioning of the project.

6.1 Budget for Environmental Protection

It is necessary to include the environmental cost as a part of the budgetary cost component. Total of Rs.1,55,000/- allocated for environmental protection activities. Environmental Management cost is given in Table 9.

Table 9 Environmental Management Cost

S. No	Details	Cost in Rs.
1	Afforestation	30,000
2	Water Sprinkling	50,000
3	Water Quality Test	25,000
4	Air Quality Test	25,000
5	Noise/Vibration Test	25,000
Total		1,55,000

7 GREENBELT DEVELOPMENT

The green belt plantation programme will be continued till the end of the mining operation in the area. In framing out this programme on a sustainable and scientific base, due consultation and coordination with the forest department will be sought. Plants are chosen to provide aesthetic, ecological and economical value. Trees will help to arrest propagation of noise and help to lessen dust pollution due to dust arresting action. The plantation will be developed inside and around the lease area is 0.10.0 Ha, out of 30.10.5 Ha. The soil dumps, are planted to prevent erosion and for stabilization of the soil.



8 DISASTER MANAGEMENT PLAN

The on-site and off-site emergency plans recommend various preventive and protective systems. A protective system includes Site controller, Incident controller and coordinators. Personnel protective equipments to be deployed at the site, control systems and mock drill and simulation exercises, mutual aid schemes, and procedures for Communications, Medical facilities to be provided and procedure for reporting to external agencies.

9 PROPOSED CORPORATE ENVIRONMENTAL RESPONSIBILITY (CER)

TAMIN will comply with the 1st May 2018 OM w.r.t. CER and the cost will be assessed on actual project capex expenditure of that particular financial year.

CER Expenditure outlay shall be spent in various social development cost based on the assessed needs @ 2% of the estimated project cost i.e, Rs.2 Lakhs over a period of 5-10 years.

10 Project Benefits

Environmental Benefits:

- Proposed greenbelt outside mine lease area will minimize air pollution, also act as noise barrier to reduce noise levels and prevents soil erosion.
- Water will be sprinkled at regular intervals during quarry operation will minimize air pollution
- No groundwater withdrawal

Social Benefits:

The quarrying activities will benefit to the local people directly (35 persons) and indirectly (20 persons).

Economic Benefits:

- Improve in per capita income of the people.
- Financially viable and would be in the interest of construction industry thereby indirectly benefiting the masses.
- Revenue generation to State government by way of taxes, royalties and DMF.



11 CONCLUSION

Assessment of the impacts due to various emissions and discharges from the mining indicate that the environmental quality will remain within the stipulated standards even after commissioning and operation of the project. All the impacts due to the operation of the mine shall be mitigated by adopting state of art technologies and management systems. In addition, the benefits of the project in terms of utilization of barren land, improvement of living standards of the local population, improvements in infra structure etc., will add positive impacts of the project.

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