

EXECUTIVE SUMMARY

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT OF LIMESTONE MINES

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

Category: B

Extent : 3.07.0 Ha
S. F. Nos. : 132/1 and 132/3(P)
Village : Panamoopanpatti
Taluk : Usilampatti
District : Madurai

PROPONENT

Tmt. B.THIRAVIAM

W/o. Dr.K.Bose

No.9/1/22A, T.B.Road, UsilampattiTaluk,
Madurai District, Tamil Nadu.

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CONSULTANT

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Executive Summary

1. Introduction

Tmt. B.Thiraviam of Limestone Mines over an extent of 3.07.0 hectare is located in S.F. No: 132/1 and 132/3(P) Panamooanpatti Village, Usilampatti Taluk, Madurai District. The area is marked in the survey of India Toposheet No.58F/16. The area lies between northern latitude of 10°02'53.79" to 10°03'01.57"N and eastern longitude from 77°51'02.7" to 77°51'10.90"E. The review of mining plan was approved by Indian Bureau of Mines in favor Tmt.B.Thiraviam vide No. TN/MDR/LST/ROMP -1512. MDS, dated 14.08.2018.

As per the Environmental Impact Assessment (EIA) Notification dated 14th September 2006, the project falls under 1(a) mining of minerals, Category – B in view of Major Mineral and lease area less than 100 Ha. In view of the above the proponent submitted the online application to SEIAA/SEAC on 04.10.2018. The proposal has been placed in 121th STATE APPRAISAL COMMITTEE MEETING on 01.12.2018 and granted Terms of Reference vide Lr. No. SEIAA-TN/F. No.6355/2018/TOR-597/2019 dated 11.01.2019.

1.1 SCOPE OF THE PROJECT

The proposal for Environmental Clearance of Limestone mine of **Tmt. B.Thiraviam** requires EIA report as per Terms of Reference vide Lr. No. SEIAA-TN/F. No.6355/2018/TOR-597/2019 dated 11.01.2019.

1.2 PROJECT DESCRIPTION

Table No 1. 1 Project Details

Project Details	
Proponent	Tmt.B.Thiraviam
Total Mine Lease Area	3.07.0 Hectares (Poramboke land)
Survey No.	132/1 and 132/3(P)
Site Location	Panamooanpatti Village, Usilampatti Taluk, Madurai District
Geographical Co-ordinates	Latitude: 10°02'53.79" to 10°03'01.57"N Longitude: 77°51'02.7" to 77°51'10.90"E
Toposheet No.	58F/16
Elevation	261-273m above MSL
Accessibility	

Proponent: TmtB.Thiraviam, Limestone Mines, Madurai District.

Nearest Habitation	380 m - Northeast
Nearest Village	Perumalpatti - 650m –NW
Nearest Town	Usilampatti-11km-Southwest
Nearest Roadway	NH- 49– Kochi to Dhanushkodi – 10.5km – S SH 154- Batlagundu – Usilampatti – 6.6km- W Vikkiramangalam to Kovilur Road (MDR)– 1.33 km West Nearest Village Road – 510m Northeast
Nearest Railway station	Karupatti Railway Station – 10.5 km East Usilampatti Railway Station – 10.7 km Southwest.
Nearest Airport	Madurai Airport - 34km – Southeast
Environmental Sensitiveness	
Interstate Boundary	Tamil Nadu- Kerala Interstate Boundary – 65km – West
Coastal Zone	Bay of Bengal – 120 m (SE) Hence the area does not attract the C.R.Z. Notification, 1991.
Reserve Forest	<ol style="list-style-type: none"> 1. Kadavankurichi RF- NW – 8.3km 2. Uttappanayakkanur RF- NW – 5.5 km 3. Vikkiramangalam RF - SW - 212m 4. Vikkiramangalam RF –NE -2.0 km 5. Doddappanayakkanur North RF- SW – 7.7 km 6. Valaiyapatti RF- W – 8.4 km 7. Vettlaipaatti RF-NW – 3.4 km 8. Mettuppatti RF- N – 2.9 Km 9. Mannadimangalam RF- E – 3km <p>But the proposed project does not cause any harm to the forest products.</p>
Wildlife sanctuary	No wildlife sanctuary is located within 10km radius. Hence the area does not attract the Wildlife Protection Act, 1972.
Water bodies	Thirumangalam Main Canal – 3.7 km – NE Vaigai River – 3.4 km – NW Periyar Main Canal – 4.2 km – NE Lake Near to Mallayampatti village – 4.3 km – NE Kulichettipatti Lake – 7.3 km – NE Thenkarai Pond – 8.8 km – SE Mambattipatti Lake – 7.5 km – SE Ayyappanayakkanpatti Lake – 6.9 km – E Vilampatty Lake - 6.1 km – NE

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	Ramarajapuram Lake – 7.8 km – NE Ayyanarkulam – 6 km – SE
Habitations	Panamooppanpatti-1km-NE -1950 Population Kalluthu -1.5km-NW – 4605 Population Ervarpatti -1.5km-NE – 2459 Population Uthappanaickanur- 6.5km-SE -6879Population Sakkarappanaickanur - 4.6km-SE -2507Population Ayyanarkulam - 6.5km-SE – 2732Population Thimmanatham- 4.5km-S - 4893Population Perumalpatti - 650m –NW - 491 Population Mahalingapuram - 3.7km –W- 375Population Kovilpatti - 2.4km – E - 655Population
Defense Installations	Nil within 10km radius
Quarries around 500m radius (AD Letter furnished)	No quarries found 500m radius
Seismic Zone	Zone-III, Low damage risk zone as per BMTPC, Vulnerability atlas Seismic zone of India IS: 1893-2002
Mining Details	
Method of Mining	Open Cast – Manual Mining Method
Geological resources	41769 m ³
Mineable reserves	4854 m ³ of Limestone
Production (30%)	250 m ³ / annum of Limestone
Topsoil	1665m ³ for entire period
Limestone Rejects (70%)	2915 m ³ for entire period
Ore to Waste Ratio	1:3.13
Depth of Mining	Total Depth of Mining – 13m
Water Table	28-30m bgl
Overall Pit Slope	45°
Period of Lease	50 Years for Limestone
Project Cost	Rs 5 Lakhs
EMP Cost	Rs 3.65Lakhs

1.3 Description of the environment

1.3.1 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 (October 1st– December 31st, 2019) to assess the existing environmental scenario in the area. For the purpose of EIA studies, Mines lease area was considered as the core zone and area outside the Mines 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 (October 1st – December 31st, 2019)		
Rainfall (Avg.)	384 mm	--
Temperature (Avg.)	21-37°C	--
Wind speed	3.05 m/s	--
Wind Direction	From N, SW, S and NE	
Ambient Air Quality (NAAQS)		
PM ₁₀	38-54 µg/m ³	100 µg/m ³
PM _{2.5}	21-33 µg/m ³	60 µg/m ³
SO ₂	5-9 µg/m ³	80 µg/m ³
NO _x	10-15 µg /m ³	80 µg/m ³
Noise Level (CPCB Standards)		
Day time (6:00 am - 10:00 pm)	Core zone – 37.2 – 41.8 dB (A) Buffer zone – 39.0- 41.5 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 – 32.7 – 35.1 dB (A) Buffer zone – 33.4-36.6 dB(A)	Industrial Area Night Time – 70 dB(A) Residential Area Night Time – 45 dB (A)
Water Quality IS 10500:2012 (Desirable limits)		
pH	7.0– 7.17	6.5 to 8.5
TDS	455 - 730 mg/l	500 mg/l
THCaCO ₃	390-574 mg/l	200 mg/l
Soil Quality		
pH	6.68 – 7.42	slightly acidic to slightly alkaline

Bulk density	1.40-1.51 g/cc	Favorable physical condition for plant growth.
Hydro Geology		
Depth of Mining	13m bgl	Mines activity 15-17m above ground water table
Water Table	28-30m bgl	

1.4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

1.4.1 Air Environment

The air borne particulate matter is the main air pollutant by opencast Mines. The Mines operations will be carried out by adopting Manual methods which involve drilling, blasting, excavation and loading. Apart from above, there will be other activities associated viz. transportation of Limestone, stocking of waste and dump management within the Mines lease area that may contribute to wash out, slope failure, leachates and other related pollution.

From the results of AERMOD Cloud 5 model, it is concluded the cumulative concentrations of PM10 due to Mines activities comply with the National Ambient Air Quality Standards (NAAQS 2009). The concentrations of SO₂ and NO_x generated from Mines area are expected to be low due to absence of any major source. It should be noted that the predicted concentrations are due to the simultaneous operations of Mines. The overall impact on air quality due to the Mines project is expected to be low.

1.4.2 Noise Environment

Noise pollution poses a major health risk to the Mines workers. The sources of noise in the proposed open cast Mines project are Drilling, Blasting, and Vehicular Movements.

The noise generated by the Mines activity is dissipated within the core zone. This is because of the 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 Central Pollution Control Board (CPCB) and 90dB (A) norms of **Directorate General of Mines Safety** (DGMS). At present no Mines activity is 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. The charge per blast of 120 kg is well below the Peak Particle

Velocity of 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.

1.4.3 Water Environment

Mines operations can affect groundwater quality in several ways. The most obvious impact occurs in Mines 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 groundwater. The impact due to Mines on the water quality is expected to be insignificant because of no use of chemicals or hazardous substances during the Mines process. The Mines activity will not intersect groundwater table. The water sample from core zone is high in TH and also poor on biological testing. Then the water sample from Kalluthu Perumalpatti and Mahalingapuram pudur village is high in Total Hardness, TDS. But based on the Water Quality Index calculated, water quality in core and buffer zone is Excellent and good respectively which is suitable for the drinking purpose. For the excellent quality of drinking the water sample from buffer zone must be treated with reverse osmosis process and water sample from core zone must be boiled before using for drinking purpose.

1.4.4 Soil Environment

Soil characteristics indicate favorable condition for plant growth. The top soil generated for the entire life of the mine will be 1665m³. It is being used for plantation purpose.

1.4.5 Waste Dump

The top soil generated for the entire life of the mine will be 1665 m³. Top soil will be removed and dumped as earth bund in lease boundary which will be used for plantation purpose. The proposed rate of production of Limestone for five years is about 1249m³ at the rate of 30% recovery up to permissible depth. The remaining 70% of rejects and other side burden which is 11735 m³ will be dumped southeastern and north side of the lease boundary. The ore to waste ratio is 1:3.13

Description	Quantity (MT)	Volume(m³)
Topsoil (Earth Bund)	2498MT	1665
Reject (35mX30m X4.13m X1.68m)	7287MT	2915
Side Burden(50mX35mX7.5m X1.68m)	22050MT	8820
TOTAL	31835MT	13400m³

1.4.6 Biological Environment

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

1.4.7 Land Environment

The LimestoneMines project will result in disturbance of the land use pattern of the Mines lease area. The land degradation is unavoidable during Mine activities like excavation, overburden dumping, soil extraction etc. So reclamation of quarried land and proper formation of benches will be given due importance. Stagnant water in the Mines pit will help in development of agriculture and afforestation in the buffer zone over a period of time utilizing the water in the Mines pit which shows a positive impact due to Mine activity.

1.4.8 Socio Economic Environment

The Mines 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 Mines activities.

Table 1.3 Environmental Management Plan

S.No	Parameters	Mining Activity	Mitigation measures
1	Air Environment	Drilling	<ul style="list-style-type: none"> ★ 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	<ul style="list-style-type: none"> ★ Regular water sprinkling on blasted heaps at regular intervals will help in reducing considerable dust pollution
		Loading	<ul style="list-style-type: none"> ★ Water sprinkling be done before loading by making it moist
		Transportation	<ul style="list-style-type: none"> ★ 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	<ul style="list-style-type: none"> ★ DG sets will be used only during power failure ★ Adequate stack height for DG sets will be provided as per CPCB norms
		General measures	<ul style="list-style-type: none"> ★ 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

Proponent: TmtB.Thiraviam, Limestone Mines, Madurai District.

			<p>as per the Metalliferous Mines Regulations (MMR), 1961 amendments and circulars of DGMS.</p> <ul style="list-style-type: none"> ★ 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	<ul style="list-style-type: none"> ★ Wastewater discharge from mine will be treated in settling tanks before using for dust suppression and tree plantation purposes.
		Ground water	<ul style="list-style-type: none"> ★ The mining activity will not intersect the ground water table ★ Desilting will be carried out before and immediately after the monsoon season
		Storm water	<ul style="list-style-type: none"> ★ 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 judiciously utilize the rainwater as part of rain water harvesting

Proponent: TmtB.Thiraviam, Limestone Mines, Madurai District.

		General measures	<ul style="list-style-type: none">★ Regular monitoring and analyzing the quality of water
3	Noise Environment	Drilling	<ul style="list-style-type: none">★ Limiting time exposure of workers to excessive noise
		Blasting	<ul style="list-style-type: none">★ 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	<ul style="list-style-type: none">★ 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

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		General measures	<ul style="list-style-type: none"> ★ 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	<ul style="list-style-type: none"> ★ 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	<ul style="list-style-type: none"> ★ Humus top soil shall be preserved for reuse in afforestation and agriculture

Proponent: TmtB.Thiraviam, Limestone Mines, Madurai District.

			<ul style="list-style-type: none"> ★ Top soil should not be mixed with other waste or reject materials. It should be conserved by judicious utilization in the Mines premises ★ Garland drains will be provided around the mine and dumps to arrest any soil from the Mines 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	<ul style="list-style-type: none"> ★ 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	Mineleaseboundary and waste dump	<ul style="list-style-type: none"> ★ 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

Proponent: TmtB.Thiraviam, Limestone Mines, Madurai District.

			the survival rate is high.
8	Land Environment		<ul style="list-style-type: none">★ 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		<ul style="list-style-type: none">★ 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.

Proponent: TmtB.Thiraviam, Limestone Mines, Madurai District.

			<ul style="list-style-type: none">★ 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		<ul style="list-style-type: none">★ 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).<ul style="list-style-type: none">○ Insurance will be taken in the name of the labourers working in the Mines★ Workers involved in Mines work shall be provided protective equipment's such as Thick Gloves, Goggles, ear plugs, safety boot wears, etc...

1.5 Analysis of Alternatives

The Mines 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.

1.6 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

1.7 Project Benefits

The proponent **Tmt. B.Thiraviam**, is very much conscious of his obligations to society at large. Under plantation programme, it is suggested to develop green belt further all along the boundary of the Mines lease area. Apart from the green belts and aesthetic plantation for eliminating fugitive emissions and noise control, all other massive plantation efforts will be executed with the assistance of experts and cooperation of the local community. The Mines 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 Limestone to destinations, sanitation, supply of goods and services to the Mines and other community services etc. The local population will have preference to get an employment. The proponent will help in socio economic development of the village by providing educational facilities to children, and welfare amenities like drinking water to school; road and medical facilities to villages and employment opportunities to nearby villagers. CSR budget is allocated as 2.5% of the profit.

1.8 Environmental Management Plan

The Environmental Management Plan (EMP) must be integrated into the process of Mines 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 Mines Plan is for the production of Limestone without deep hole drilling and heavy blasting. Only controlled blasting is undertaken. Such limited Mines activity is not likely to cause

any impact adversely on the environment as far as pollution of air, water, land and noise is concerned.

1.9 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 Mines activity. Mines activity will help in improving the socio-economic benefits in areas like employment, communication and infrastructure development.