SUMMARY

FOR

PANAMOOPPANPATTI LIMESTONE MINE

SITE DETAILS		
Extent	3.07 Ha	
Survey No.	132/1, 132/3(P)	
Location	Panamooppanpatti Village, Usilampatti Taluk, Madurai District, Tamilnadu	
Land Type	Government Poromboke Land	
PROJECT DETAILS		
Category	B1 - Sector 1(a)	
Type	Expansion	
Lease period	50 Years (02.02.1998-01.02.2048 as per MMDR Act, 2015)	
PRODUCTION	As per Existing EC	Proposed Expansion
Production	(1876T ROM) 563T of Limestone 1313T of Rejects	(74342.50T ROM) 52039.75 TPA of Limestone (Peak) 22302.75TPA of Rejects
Ultimate Depth	13m	34m
Mining Method	Opencast Mechanized	

PROJECT PROPONENT

B.THIRAVIAM

D.No.15/22A, Kavandanpatti Road, Usilampatti

CONSULTANT

CREATIVE ENGINEERS & CONSULTANTS

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Creating Possibilities

APRIL 2024

SUMMARY

1.1 INTRODUCTION:

Tmt.B.Thiraviam's Panamooppanpatti Limestone Mine over an area of 3.07 Ha is located in Survey No. 132/1 and 132/3 (P) in Panamooppanpatti Village, Usilampatti Taluk, Madurai District, Tamil Nadu. The lease was executed on 02.02.1998 and the lease is deemed to be extended upto 01.02.2048 as per MMDR Act, 2015. Only small scale mining operation is carried out by the lessee in this lease and no mining in this lease is carried out since 09.06.2015 for want of EC.

Environment Clearance for this project was obtained recently vide Lr.No.SEIAA-TN/F.No.6355/1(a)/ EC.No.5720/2018 dated 09.05.2023 for the production quantity of 563T of Limestone and 1313T of rejects with an ultimate depth of mining of 13m bgl after conducting public hearing for this capacity on 23.02.2021.

The proponent has not recommenced mining operations so far since the envisaged production capacity is very low and it will not be economical.

As such, now It is proposed to expand the production capacity from 563T of Limestone and 1313T of rejects (1,876T ROM) upto a depth of 13m to 52039.75TPA of Limestone and 22302.75TPA of rejects (74,342.5T ROM) upto a total depth of 34m.

Considering that this is a limestone mining project which is a major mineral with a lease area of 3.07Ha, this project falls under Sector 1(a) i.e.; Mining of Minerals under Category B1 and as per MoEF & CC notification, this expansion proposal necessitates preparation of EIA/EMP report along with public hearing and the PP has initiated action towards the same.

1.2 STATUTORY APPROVALS:

1.	Mining Lease	• Granted vide .O.3(D) No.124/Industries (MMD2) Dept. dated 31.07.1997 • Executed on 02.02.1998 and was valid upto 01.02.2018 • Renewal application submitted. Deemed to be extended upto 01.02.2048 as per MMDR Act, 2015
2.	Environmental Clearance	• Environment Clearance for this project was obtained recently vide Lr.No.SEIAA-TN/F.No.6355/1(a)/ EC.No.5720/2018 dated 09.05.2023 for the production quantity of 563T of Limestone and 1313T of rejects with an ultimate depth of mining of 13m bgl.

		• The proponent has not recommenced mining operations for this production quantity so far.
3.	Review of Mining Plan for expansion	Approved by IBM Chennai vide Lr.No. TN/MDR/ROMP/LST-1712.MDS dated 30.08.2023
4.	Terms of Reference for expansion	Obtained from SEIAA – Tamil nadu vide letter no SEIAA-TN/F.No.10501/SEAC/1(a)/ToR-1663/2024 dated 08.02.2024

As per TOR Condition, EIA/EMP report is prepared for this expansion proposal. Salient details of the report is given below.

2.1 SITE DESCRIPTION:

Table No.1: SITE DETAILS

S.No	Particulars	Details
1	Name of the Project	Panamooppanpatti Limestone Mine of Tmt.B.Thiraviam
2	Location of the project	Panamooppanpatti Village, Usilampatti Taluk, Madurai District, Tamil Nadu
3	Latitude & Longitude	**Latitude:** 10º02'54.58" N to 10º03'2.63" N **Longitude:** 77º51'2.11" E to 77º51.10.35" E
4	Mining Lease area	3.07 Ha
5	Type of land	Government Poromboke Land
6	Mine site topography	Almost Plain Terrain surrounded by hills
7	Accessibility	The lease area is accessible from Panamoopanpatti village from Vikkiramangalam Kovilore Road about 1.5Km on the eastern side of the lease area which joins Kalyanipatti – Kamarajnagar road on the northern side of the lease area.
8	Nearest Highway	SH-154 – 6.5Km - W
9	Nearest Railway station	Sholavandan R.S – 12.5Km -E
10	Nearest Airport	Madurai – 33Km - SE
11	Nearest major water bodies	**Name** / **Distance (Km)** / **Direction** Tirumangalam Main canal / 3.9Km / NE Vaigai River / 3.4Km / N
12	Environmental sensitive areas, Protected areas as per Wildlife Protection Act, 1972 (Tiger reserve, Elephant reserve,	Nil within 10 Km radius

S.No	Particulars	Details		
	Biospheres, National parks, Wildlife sanctuaries, community reserves and conservation reserves)			
13	Notified Archaeologically important places, Monuments	Nil within 10 Km radius		
14	Reserved / Protected Forests	Vikkiramangalam R.F	320m	SW
		Mettuppatti R.F	2.3km	N
		Mannadimangalam R F	2.6km	E
		Vettilaippatti R.F	3.2km	W
		Uttappanayakkanur R.F	6.4km	W
		Doddappanayakkanur North R.F	7.6km	W
		Kadavakurichi R.F	8.4Km	NW
		Valaiyapatti R.F	8.6Km	W
		Kodhamangalam R.F	9.6Km	SE
15	Seismic Zone	Zone – II (Least Active)		

Table No.2: TECHNICAL DESCRIPTION

S.No	Particulars	Details
1	Geological reserve	10,42,266T of Limestone
2	Mineable reserve	6,91,713T of Limestone
3	Method of Mining	Opencast semi mechanized mining using jackhammer drilling, blasting, excavation through excavator, manual sorting and mineral transport through tippers will be carried out.
4	Peak Production	52039.75TPA of Limestone and 22302.75TPA of rejects (74,342.5T ROM)
5	Lease period	Upto 01.02.2048
6	Waste Generation and Management	Top soil to be generated will be stacked separately and used for plantation, creation of embankment etc. Waste to be generated in the 5 years plan period will be dumped in waste dump – 2 and in the conceptual stage this waste along with the waste to be generated in the conceptual stage will be used for backfilling the mined out void. Mineral reject will be dumped in

S.No	Particulars	Details
		Waste Dump-1 which will be stabilized by means of plantation ultimately
7	Ultimate Mine depth	34m
8	Manpower	22 People directly and more than 50 people indirectly
9	Water Requirement & source	Total water – 10 KLD Will be procured from outside agencies initially. Later, water collected in the mine pit will be used to meet the needs.
10	Power Requirement	All the equipment will be diesel operated. No electricity is needed for mining operation. The minimum power requirement for office, etc will be met from state grid.
11	Site services	Mine office, first aid room, rest shelters, toilets etc. will be provided as semi-permanent structures.
12	Project cost	Rs.160 Lakhs
13	CER cost	Rs.5.0 Lakhs

3.1 EXISTING ENVIRONMENTAL SCENARIO:

The studies and data collection have been carried out systematically and meticulously as per relevant IS codes, CPCB and MoEF&CC guidelines and as per approved ToR during **Winter Season (December 2023 – February 2024)**. For the purpose of this study, the area has been divided into two zones, namely, core and buffer zones. Core zone is considered as the total lease area, while buffer zone encompasses an area of 10 km radius distance from the periphery of core zone. Based on 2011 census data, in the 10km radius there are 49 Rural villages and from 3 Taluks and 2 Districts.

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

Details	Population	Percentage
A. Gender-wise distribution		
Male Population	93803	50.84
Female Population	90719	49.16
Total	**184522**	**100**
B. Caste-wise population distribution		
Scheduled Caste	41568	22.53
Scheduled Tribes	906	0.49
Other	142048	76.98

Details	Population	Percentage
Total	**184522**	**100**
C. Literacy Levels		
Total Literate Population	118629	64.29
Others	65893	35.71
Total	**184522**	**100**
D. Occupational structure		
Main workers	81120	44.00
Marginal workers	22453	12.20
Total Workers	**103573**	**56.20**
Total Non-workers	**80949**	**43.90**
Total	**184522**	**100**

3.2.1 EXISTING ENVIRONMENTAL QUALITY:

Table 1: Baseline Data

A) AMBIENT AIR QUALITY	**Monitoring Location –** 6 locations		
PARAMETER	**RESULT (µg/m3)**		***LIMIT (µg/m3)**
Location	**Core Zone**	**Buffer Zone**	
Particulate Matter (Size <10 µm)	39.1 – 49.1	41.3 – 64.9	100
Particulate Matter (Size <2.5 µm)	17.9 – 22.6	19 – 30.5	60
Sulphur Dioxide (as SO_2)	4.7 – 6.2	5.4 – 8.7	80
Nitrogen Dioxide (as NO_2)	7.1 – 9.6	7.4 – 12.7	80
Conclusion: The existing Ambient Air Quality levels for PM10, PM2.5, SO2 and NO2, are within the NAAQ standards prescribed CPCB limits of 100 µg/m3, 60 µg/m3, 80 µg/m3 & 80 µg/m3. The CO values in all the locations were found to be below detectable limit. Silica values in the study area are found to be below detectable limit. (Detection limit – 0.05 mg/m3)			
B) WATER QUALITY	**Monitoring Location –** 6 locations		
PARAMETER	**Result**		***LIMIT (µg/m3)**
pH at 25 ˚C	7.06 – 7.55		**6.5-8.5**
Total Dissolved Solids, mg/L	342 – 856		**2000**
Chloride as Cl-, mg/L	98.6 – 216		**1000**
Total Hardness (as CaCO3), mg/L	184 – 478		**600**
Total Alkalinity (as CaCO3), mg/L	187– 438		**600**
Sulphates as SO42-, mg/L	32.5 – 152		**400**
Iron as Fe, mg/L	0.02 – 0.05		**0.3**
Nitrate as NO3, mg/L	1.45 – 4.65		**45**
Fluoride as F, mg/L	0.16 – 0.54		**1.5**
Conclusion: The water quality of ground water is found to be within the prescribed Permissible			

limits of IS: 10500 Norms in the absence of an alternative source as per Drinking Water Specifications.

C) NOISE LEVELS	**Monitoring Location –** 6 locations		
PARAMETER	**RESULT dB(A)**		***LIMIT (µg/m3)**
	Day Equivalent	**Night Equivalent**	
Core Zone	40.7	37.4	**90**
Buffer Zone	42.6 – 51.2	38.3 – 44.9	**Day Equivalent - 55dB(A), Night Equivalent - 45dB(A)**
*Permissible noise for industrial workers as laid down by CPCB (at 8 hrs Exposure Time). While comparing with the MoEF&CC Norms, the monitored ambient noise levels are generally within the limit values.			

D) SOIL QUALITY	**Monitoring Location –** 3 locations
PARAMETER	**Range of values**
pH	6.97 – 7.65
Electrical Conductivity (µmho/cm)	40.35 – 97.44
Organic matter (%)	94.87 – 97.23
Total Nitrogen (mg/kg)	2.77 – 5.13
Phosphorus (mg/kg)	0.72 – 0.94
Sodium (mg/kg)	432 – 510
Potassium (mg/kg)	310 – 360
Soil is of Loam Type.	

3.2.2 LAND EVIRONMENT:

Landuse pattern study carried out through remote sensing satellite data around the 10km buffer zone shows that 15.24 % of the study area is agriculture land and 8.86 % are fallow land. Land with scrub constitutes 31.72 %, lands without scrub constitute 18.21 % , Scrub Forest constitute 20.15 % and waterbodies & others constitute 5.82 %.

3.2.3 BIOLOGICAL ENVIRONMENT:

Flora: The lease area is a non-forest, private land. Major part of lease area is barren fallow land with bushes (Prosopis juliflora) and grasses. Study area represents varying land use comprising rocky hills (represented as RF) on the north, south and west of the lease area. Thorny bushes,cactus variety of species only observed in these RF areas. Besides, further north along side the vaigai river, coconut grooves and agricultural activities are observed. The Dominated

species are Prosopis juliflora, Azadirachta indica, Borassus flabellifer, Acacia nilotica, Albizia lebbeck, Acacia leucophloea, Acacia auriculiformis, etc.

Fauna: There is no Wild Life Sanctuary or National Park within the study area of 10 km. Domesticated animals are commonly found. No wild mammalian species was directly sighted during the field survey. There is no Schedule I species in the core & buffer zone.

3.2.4 HYDROLOGICAL STUDY:

In the study area, the shallow aquifer is developed through dug wells and deeper aquifer through tube wells. The groundwater has revealed that potential fractures are encountered at deeper levels. The occurrence of groundwater mainly in the porous soil are weathered layers, very negligible amount of groundwater percolated through the poorly fractured layer, after that there is no existence of groundwater. Besides, the mining area consists of hard compact rock, no major water seepage within the mine is expected.

4.1 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

As already mentioned, only small scale mining operations are carried out in this lease and no mining activities are carried out since year 09.06.2015 . The identified impacts due to this mine expansion project during mining and associated activities have been studied in relation to various environmental components like Air, water, noise, vibration, land, transport etc.

4.1.1 AIR ENVIRONMENT:

The principal sources of air pollution in general due to mining and allied activities will be Excavation, Drilling, Movement of HEMM such as Excavators, tippers etc., Loading and unloading operation and transportation. In case of this mine, the following measures will be adopted to control impact on the air quality due to mining operations in the lease area:

- Regular wetting of transport road using mobile water tanker.
- Wet drilling / Covering of drill holes with wet clothes
- Proper maintenance of roads.
- Avoiding overloading of tippers & Transportation of material by tarpaulin covered trucks
- Proper maintenance of HEMM to minimize gaseous emission
- Setting up of tyre washing facility in the lease area exit.

- Vehicular emission tests with digital smoke meter.
- Provision of green netting around the lease periphery on all sides.
- Development of green belt/ plantation in various areas within the mine lease area etc.

By adoption of all these measures, no adverse impact on air quality is envisaged due to this expansion project.

The impact on air quality due to the project is estimated using AERMOD View Gaussian Plume Air Dispersion Model.

The Post expansion resultant added concentrations with baseline figures even at worst scenario, show that the values of ambient air quality with respect to PM_{10} are in the range of 46.9 μg/m3 to 65.9 μg/m3 and with respect to PM2.5 are in the range of 22.1 μg/m3 to 31.5 μg/m3 which are within the statutory limits in each case.

For preservation of environment in this mine strict enforcement of management schemes will be undertaken for taking corrective actions, as needed. By adopting the effective implementation of all the mitigative measures, no adverse impact on Air quality due to the mining operation in this lease area is expected.

4.1.2 WATER ENVIRONMENT:

The total water requirement for this project will be 10.0 KLD. The water will be sourced initially from outside agencies. Later the rainwater collected in the mine pit sump will be used for this purpose.

The domestic effluent to be generated from the project will be collected in septic tank with soak pits arrangements. This being a mining project there will not be any process effluent. The rain water falling in the quarry will be harvested in the sump at the lowest level of the quarry. This sump will act as a settling pond to prevent solids escaping along with discharge, before outlet. etc. Effective monsoon surface run off management like provision of about 890m of Garland in the mine periphery, around waste dumps About 890m of Retaining wall is constructed at the toe of the dump. Drains are connected to the settling ponds and supernatant clear water is let out. to the downstream users.

There is no major waterbodies or drainage courses in and around the lease area. The nearest water body is Tirumangalam Canal which is beyond 3.88Km and Vaigai River which is at 3.4Km. No major impact is envisaged on the water bodies due to project operations

4.1.3 NOISE ENVIRONMENT:

During mining operation there will be noise generation due to working of excavators, movement of vehicles, etc. However, it will be felt near the active working area only and at away from its source it will get reduced. There will also be attenuation due to vegetation, tin sheet/ green netting to be erected by the proponent all around the lease and as such there will not be any adverse noise propagation outside the lease boundary Due to natural attenuation effects, by proper green belt development, design / maintenance of machines, etc., the impact on noise levels will be negligible and are expected to be well within the prescribed limits.

4.1.4 VIBRATION:

During mine workings, blasting & vibration effects will be controlled by adopting following measures.

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

By adoption of above measures, it will be ensured that ground vibrational levels due to blasting will be maintained within the prescribed DGMS conditions of 10 mm/s for the domestic houses/structures.

4.1.5 IMPACT ON LAND ENVIRONMENT:

In the post mining stage, an area of 2.21.40 Ha of mined out area will be left as water body, 0.03 Ha will be roads & 0.82.6Ha of land will be covered with plantation. Entire mined out area

will be properly fenced to prevent inadvertent entry of men and animals. In the post mining stage the rainwater harvested in the mined out void shall be utilized.

4.1.6 BIOLOGICAL ENVIRONMENT:

Necessary mitigative measures like dust suppression, proper maintenance of equipment's, greenbelt and plantation etc., will be carried out to prevent dust generation & any further impact on the vegetation or agricultural activity nearby. Greenbelt / Plantation will be carried out to enhance the vegetative growth and aesthetic in the safety zone area

4.1.7 SOCIO ECONOMIC ENVIRONMENT:

The entire lease area is Government Poromboke Land owned by the applicant. There are no habitations or hutments in the core zone area and no rehabilitation or resettlement problems will arise here.

The mining operations will provide the following socio-economic benefits:

- Direct Employment for about 22 persons.
- Besides through allied opportunities in logistics, trading, repairing works etc. good employment potential will arise in this area, which will provide raising income levels and standards of living in the area through various service-related activities connected with the project operations.
- Benefit to State and central exchequer by way of royalty, taxes.

Towards the socio-economic development of the surrounding area, the proponent has earmarked an amount of Rs.5.0 Lakhs under Corporate Environmental Responsibility. The activities identified under CER will be implemented in a phased manner in the nearby Government school. In consultation with the locals based on the need & priority it will be implemented.

By carrying out systematic and scientific mining and implementing all the environmental mitigative measures it will be ensured that there will be no adverse impact on this front.

4.1.8 IMPACT ON LOCAL LOGISTICAL SYSTEM DUE TO PROJECT:

The mined out limestone will be transported to end users by road. Since the production is less, during the project operations, there will be just 1 trip/hr. The transport route will be properly

maintained to absorb this traffic due to this project. The following mitigative measures are suggested for mitigation of adverse impacts on the logistical aspect of the project:

- Water sprinkling on mineral in the transport vehicles before transporting, so that no dust nuisance during transport will arise.
- Plantation on either side of the transport road in consultation with the concerned department.
- Proper maintenance of transport road.
- Proper maintenance of transport vehicles.
- Avoiding overloading of material.
- Covering of loaded vehicles with tarpaulins sheet.
- Keeping traffic regulators at vulnerable locations.
- Limiting of speed
- Installation of barriers at vulnerable locations

4.1.9 WASTE MANAGEMENT:

There is no process effluent generation from this mine. Hence no liquid waste is generated. Single use plastics/ use and throwaway plastics will be banned in the site as directed by the Tamil Nadu Government vide GO(Ms)No.84 regarding ban on use of plastic products. The employees will be encouraged to use compostable material or reusable material.

5.1 ENVIRONMENTAL MONITORING PROGRAME:

Regular, systematic and sustained programme schedules for implementation and monitoring of various control measures are devised with clear cut guidelines of various concerned plans for keeping a continuous surveillance on the various environmental quality parameters in the area. The Mines Manager in the mine project site will be directly responsible for various environmental activities in the mine and will undertake effective monitoring and implementation of various environmental control measures promptly and effectively and to oversee various environmental management schemes for air quality control, water quality status, noise level control, plantation programme, social development schemes, etc in the mine. Towards EMP

measures, Rs.23.57 Lakhs is allocated under capital cost. Besides, Rs.18.30 Lakhs per annum is allocated as recurring cost.

7.1 CONCLUSION:

By systematic and scientific mining adhering to all the statutory norms and enforcing and strictly implementing the above said mitigation measures mentioned in this report, no adverse impact is envisaged. The proposed expansion will benefit this region in the fields of potential employment opportunities, improved income for local people, improved social welfare facilities in respect of education, medical healthcare systems, etc. in its own way and also revenue to Government through royalty, taxes etc. Besides, it will mee the raw material requirement of the cement plant also.

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