

# EXECUTIVE SUMMARY

FOR

CAPACITY EXPANSION OF KALLANKURICHI LIMESTONE MINE (GO.344)  
FROM 0.20 MILLION TPA TO 0.70 MILLION TPA

AT

VILLAGES- KALLANKURICHI, AMEENABAD & KAIRULABAD, TEHSIL-ARIYALUR,  
DISTRICT ARIYALUR, STATE-TAMIL NADU

MINE LEASE AREA-240.61.0 HA

[CATEGORY 'A' AS MINING AREA IS GREATER THAN 100 HACTARE]

## APPLICANT



**M/S TAMIL NADU CEMENTS CORPORATION LTD**  
(A Government of Tamil Nadu Undertaking)



**BASELINE STUDY PERIOD: DEC 2019-FEB 2020**

**MC/EM/MNG/81/(DEIA-V<sub>01</sub>)**

**DEC, 2021**



**PREPARED BY**

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## **EXECUTIVE SUMMARY**

### **1. INTRODUCTION**

The Proposal of G.O. no. 344, Kallankurichi Limestone Mines of M/s Tamil Nadu Cements Corporation Ltd. is for expansion in production capacity from 0.20 MTPA to 0.70 Million TPA, from Mine lease area of 240.61.0Ha. The mine is situated at Villages-Kallankurichi, Ameenabad & Khairulabad, Taluk & District- Ariyalur, Tamil Nadu.

The Government of Tamil Nadu has granted Existing Kallankurichi limestone mining lease over an extent of 240.61.0 ha. survey No. 6/1,6/2,6/3 etc., in Villages- Kallankurichi, Ameenabad & Khairulabad, Tehsil-Ariyalur, District Ariyalur, State-Tamil Nadu. vide G.O. Ms. No. 344, dated: 10.03.1980 for 20 years and the lease deed was executed w.e.f. 27.4.1981 and is valid till 26.4.2001.

TANCEM Ltd., had submitted application for grant of renewal of mining lease for a further period of 20 years in 2000 and the renewal application under consideration of the Government, as per section 8A(5) of Mines and Minerals (Development & Regulation) Amendment Act, 2015 wherein the provision for renewal of mining lease has been dispensed with extension of lease period for 50 years from the date of first grant. In the instant case, the lease period has been extended upto 12.11.2035 subject to the statutory compliances including submission of environment clearance.

A fresh LOI has been granted by Department of Geology and Mining, Tamil Nadu vide Rc No. 18307/MM9/2001dated 24.10.2019.

The Mining Plan for Kallankurichi limestone mining lease over an extent of 240.61.0 ha was approved by the Controller of Mines (SZ), Indian Bureau of Mines, Bangalore vide TN/ALR/LST/MS/598-SZ/1062 dated 30.01.2012. The Scheme of Mining was approved by GOI, MOM, IBM, office of the Regional Controller Chennai Region of Mines vide letter no. TN/ALR/LST/MS/1299-MDS dated 29.01.2016 and it is valid upto 31.03.2021. Review of Mine Plan has been approved by GOI, MOM, IBM, office of the Regional Controller Chennai Region of Mines vide letter no. TN/ALR/LST/ROMP-1656 MDS dated 15.06.2021.

Initially M/s Tamil Nadu Cements Corporation Ltd applied on 12.03.2014 in the Ministry for grant of Terms of References. The proposal was considered in EAC meeting held during May 28<sup>th</sup> -30<sup>th</sup>, 2014, the Committee observed that this is violation case as mine was operated without obtaining prior environmental clearance after lease fell, due for renewal in 2005 and also enhanced the production of limestone. PP submitted the past production details vide letter Rc.No.8/G&M/2019, dated 12.04.2019 from 1980-81 to 2014-15 as per production details it resembles that PP had been carried out the mining operations from 1980-1981 till 2014-15 without Environmental clearance. Ministry vide letter no. J-11015/137/2014\_IA.II (M) dated 14th July, 2014 issued the closure direction under section 5 of E (P) Act, 1986. TANCEM submitted the First Schedule Form-I of MMR, 1961 in respect of actual date of discontinuous of Kallankurichi Limestone Mines of Tamil Nadu Cements Corporation Ltd to the Director General of Mines Safety, Dhanbad, Eastern Railway, Jharkhand State vide letter no. TANCEM/ACW/KLSM FORM-1/2018 dated 25.01.2018. Thus the instant proposal is deemed fit in to the violation of E(P) Act, 1986 as the mine was in operation without obtaining Environmental Clearance.

TANCEM applied for Term of References (ToR) to MoEF&CC on 19.06.2017 under violation category for Existing G.O. No. 344, Kallankurichi limestone mining lease over an extent of 240.61.0 ha in pursuance of the MoEF&CC office memorandum vide F. No. Z-11013/22/2017-IA.II (M). The proposal was appraised in the EAC(V) meeting held during 29-31 January, 2019 wherein the committee deferred the proposal and sought the information PP submitted the information accordingly the proposal was reconsidered in the EAC in its meeting held during 1<sup>st</sup> November,

2019 wherein the committee recommended the proposal for grant of TOR vide **F.No.23-19/2019-IA.III (V) dated 14.05.2020** for preparation of EIA report along with assessment of ecological damage, remediation plan and natural and community resource augmentation plan.

The production details are as follows.

Period 1980-81 to 2014-15

Limestone Transportation details for the G.O.344	
Year	Quantity (in MT)
1980-81	90270.18
1981-82	339399.29
1982-83	34387.02
1983-84	478261.93
1984-85	405378.54
1985-86	0.00
1986-87	11923.74
1987-88	58043.11
1988-89	127677.97
1989-90	163719.62
1990-91	147926.76
1991-92	202073.10
1992-93	224432.09
1993-94	289499.24
1994-95	144421.29
1995-96	329422.74
1996-97	186261.44
1997-98	0.00
1998-99	323415.26
1999-2000	231360.76
2000-01	95000.16
2001-02	180149.98
2002-03	244770.54
2003-04	89242.66
2004-05	0.00
2005-06	10455.74
2006-07	80000.00
2007-08	59967.39
2008-09	166002.47
2009-10	254498.55
2010-11	199528.25
2011-12	324073.41
2012-13	233705.74
2013-14	305676.43
2014-15	168810.70
<b>Total</b>	<b>6199756.10</b>

  
Deputy Director  
Geology and Mining,  
Ariyalur.

**Table 1: Brief Description of the Project**

S. No.	Particulars	Details	
A.	<b>Nature and Size of the Project</b>	Expansion in production capacity from 0.20 Million TPA to 0.70 Million TPA, of Kallankurichi Limestone Mines (G.O. No. 344) by Tamil Nadu Cement Corporation Limited.	
B.	<b>Location</b>		
	<b>Name of Unit</b>	<b>Survey Number</b>	<b>Area of Block in ha</b>
	<b>Kallankurichi Limestone Mines</b>	Survey No.s 6/1, 6/2, 7/1, 7/3 etc., in Villages-Kallankurichi, Ameenabad & Khairulabad, Tehsil-Ariyalur, District Ariyalur, State-Tamil Nadu	240.61.0
	<b>Total</b>		<b>240.61.0</b>
	<b>Village</b>	Kallankurichi, Ameenabad & Khairulabad	
	<b>Tehsil</b>	Ariyalur	
	<b>District</b>	Ariyalur	
	<b>State</b>	Tamil Nadu	
	<b>Geographical Coordinates</b>	11° 08'13.68"N to 11° 10'09.58"N 79° 05'27.00"E to 79° 07'00.90"E	
	<b>Toposheet (OSM) No.</b>	58 M/4	
C.	<b>Lease Area Details</b>		
	Lease Area	<b>240.61.0 Ha</b>	
	Depth of Mining	101.00 m above MSL to 65 m above MSL <i>Source: Mining Plan</i>	
D.	<b>Cost Details</b>		
	Cost of the project	Approx. Rs. 29.82 Cr.	
	Cost for EMP	Rs. 59.55 Lakhs & 10.00 Lakhs recurring cost	
	OH&S	Rs. 2.0 Lakhs/Yr	
	Cost For Biodiversity Conservation	Rs. 5.00 Lakhs/-	
E.	<b>Environmental Settings of the area</b>		

Ecological Sensitive Areas (National Park, Wild Life Sanctuary, Biosphere Reserve, Reserve/ Protected Forest etc.) within 10 Km radius	No such area is located within 10km radius of the mine lease area.
Inter-state boundary within 5 Km radius	No such area is located within 10km radius of the mine lease area.
Nearest Town/ Major City with 200000 population	Ariyalur ~ 2.8km (Population-7,54,894)
Nearest Railway Station	Ariyalur Railway station approx 2.58 Km in W.
Nearest State Highway/ National Highway	SH-217 Approx 98 meter, NW NH-227 Approx 2.83 km, SE
Nearest Airport	Trichy International Airport approx 70 Km in SW direction
Medical Facilities	KVS hospital, Ariyalur~2.5 Km
Education Facilities	Vidhya Mandir School, Ariyalur~1.5 Km Montfort Matriculation Higher Secondary School~2.0 Km
Seismic Zone	Zone II
Water Body	---

## **2. PROJECT DESCRIPTION**

### **2.1 Method of Estimation Reserve**

As per UNFC guide lines the project proponent has already carried out detailed exploration. The reserves are estimated as per UNFC classification. UNFC parameter for proved reserve in (UNFC Code 111).

The category wise Mineable Reserve using UNFC code with the quantity and grade of the mineral are tabulated as given as under:-

**Table 2: Category wise Reserve**

Classification	Category	Qty. (in tons)	Qty. (in Mill. tons)	Grade
A. Mineral Reserve	111	3005268	3.005268	Cement Grade
B. Remaining Resources	221	1146984	1.146984	Cement Grade
<b>Total Reserve</b>		<b>4152252</b>	<b>4.152252</b>	<b>Cement Grade</b>

Source: Review Mine Plan

**Proposed Production**= 0.70 Million Tons per Annum

**Working days**=300 days

**Daily Production**= 2356.8 Tons/Day say 2357 Tons/Day

## 2.2 Method of Mining

The method of mining is by fully mechanized open cast method; Jackhammers with compressors and wagon drills will be deployed for drilling. Blasting will be carried out to loosen the insitu limestone. Slurry type of explosives with ANFO will be used for blasting. The spacing and burden will be 3m and 2.8m the depth of the hole will be 6m, giving 10% sub grade drilling to avoid toe formation. The blasting will be restricted to two to three rows of drilling with each row consisting of 10 to 12 holes. The holes are drilled either in a staggered pattern or square pattern.

Loading and transport of the mineral and waste will be done by Hydraulic excavators and tippers.

- (i) Primary breaking of rock will be done by conventional drilling and blasting operations. Using drilling and blasting techniques.
- (ii) Backhoe excavator is engaged for material handling into the tippers.
- (iii) For transportation of ore from the mines to the cement plant nearby will be hired through contractors. Water spraying on haul roads and mine roads will be done regularly on working days by a 4 KL water tanker.

At present there are six existing pits and their dimensions are given below:

Pit No.	Length	Width	Depth	Area In Ha.	Dip & Strike
1	200	320	6	56.50.0	E-W –Dipping N
2	217	455	6		
3	265	365	6		
4	640	440	6		
5	300	285	6		
6	360	400	6		

### i) **Pitting:**

The depth of the mine has reached maximum 6m. Based on the existing trial pits and drilled bore holes, the depth of the mineralization has been proved upto 6 m depth in the lease area. There is no additional formation of pits in the existing mine. The mining pit indicates the limestone deposit and direction. To confirm the mineral deposit and characteristics features of the Limestone mineral and to find out the further depth persistence of the mineralization, One hundred and seventy nine core drills (PBH-1- PBH-179) upto 30m depth are proposed from the surface level @ 200m grid interval, for future exploration during the present plan period in the year 2022-23. Locations of the proposed core drills are marked in the geological plan and year wise plan.

## ii) Trenching

As discussed above, there is no requirement of trenching in the existing mine. Besides, active mines in this region prove that the terrain consist of cretaceous limestone formation.

## 2.3 Production Detail

Year wise proposed production is as given below:

Year	ROM Quantity (Ts)	Limestone @100%(Ts)	ROM/Waste Ratio
2021-22	306240	306240	1:0
2022-23	407136	407136	1:0
2023-24	453180	453180	1:0
2024-25	707040	707040	1:0
2025-26	706716	706716	1:0
<b>Total</b>	<b>2580312</b>	<b>2580312</b>	<b>1:0</b>

Source: Review of Mining Plan

The anticipated annual production ROM (proved 111) would be about 5,43,224 tonnes/year (average) and for the end of the life of the mine is 30,05,268 Ts of ROM, when the Mine is fully developed.

## 2.4 Stacking of mineral reject /sub grade material and disposal of waste

There is no generation of topsoil and waste during the present plan period. Since mining operation does not generate any harmful waste, question of treatment does not arise.

### Generation of waste in the plan period

Year	Top soil			Mineral Reject		
	Reuse/spreading	Storage	Back filling	Storage	blending	Beneficiation
2021-22 to 2025-26	Nil	Nil	Nil	Nil	Nil	Nil

## 2.5 Mineable reserve and anticipated life of the mines

Mineable reserve is now estimated to be 3.0053 Million Tons of proved reserve of “111” as per UNFC classification. Considering 0.70 Million TPA of production per year life of the mine is expected to be 6 years.

## 2.6 Project Requirements

### 2.6.1 Land Requirements

Total Mine lease area is 240.610 Ha out of which 218.825 Ha Patta Land and 21.785 Ha Government Land.

## 2.6.2 Water Requirement

Water requirement for plantation and dust suppression will be 36.57 KLD, which shall be met from water tanker through reservoir at G.O. 344.

## 2.6.3 Power Requirement

No electrical power shall be required for operations as the mining will be worked out during day time in two shifts.

## 2.6.4 Man power Requirement

It includes managerial & supervisory staff directly employed by the company and skilled, semi skilled workers through contractual. Therefore, total strength of workforce in the mine site is **40**.

## 3. DESCRIPTION OF ENVIRONMENT

Environmental data has been collected in relation to proposed mining for Air, Noise, Water, Soil, Socio-economic and Ecology & Biodiversity. The generation of primary data as well as collection of secondary data and information from the site and surroundings was carried out during pre monsoon season i.e. December 2019 to February, 2020.

**Table 3: Baseline Environment Status**

Parameter	Baseline Status
<b>Ambient Air Quality</b>	PM <sub>10</sub> -44.16 to 88.00 µg/m <sup>3</sup> PM <sub>2.5</sub> -25.20 to 53.96 µg/m <sup>3</sup> SO <sub>2</sub> -5.0 to 16.0µg/m <sup>3</sup> NO <sub>x</sub> -14.0 to 28.0µg/m <sup>3</sup>
<b>Noise Level</b>	Noise Level During Day Time -48.4-56.4 dB Noise Level During Night Time -36.4-43.2 dB
<b>Water Quality</b>	Surface Water: <ul style="list-style-type: none"> <li>• The analysis results indicate that the pH value is 7.38 to 7.82. which is well within the specified standard of 6.5 to 8.5.</li> <li>• The TDS was observed as 608 to 712 mg/l.</li> <li>• The chlorides were found as 148 to 194 mg/l.</li> <li>• The Fluoride were found as 0.36 to 0.56 mg/l. It is observed that sulphates are within limits;</li> <li>• Total hardness ranges between 199 to 239 mg/l.</li> </ul> Ground Water: <ul style="list-style-type: none"> <li>• pH varies from 7.24 to 7.62</li> <li>• Total Hardness varies from 218 to 328 mg/L</li> <li>• Total Dissolved Solids varies from 462 to 642 mg/L</li> <li>• Fluoride varies from 0.46 to 0.66 mg/L</li> <li>• Chloride varies from 88 to 166 mg/L</li> </ul>



<b>Soil Quality</b>	<ul style="list-style-type: none"> <li>• The analysis results show that soil is basic in nature as pH value ranges from 6.88 to 7.52 with organic matter 1.08 % - 1.46%.</li> <li>• The concentration of Nitrogen (13.2 mg/100gm to 15.5 mg/100gm) Phosphorus 0.62 to 0.89 mg/100gm) and Potassium (8.1 to 9.8 mg/100gm) has been found to be in good amount in the soil samples. The soil is found to be suitable for the agricultural purpose.</li> <li>• The soil will not be affected by proposed mining project since the mining &amp; its allied activities will not affect the nearby soil quality of area.</li> </ul>
<b>Traffic Density</b>	The LOS value for the SH-27, SH-139, NH-227 will remain same as "Excellent". However, LOS value for the SH-143 be changed from "Excellent" to "Very Good" after post mining. So the additional load on the carrying capacity of the concerned roads is not likely to have any significant adverse affect.
<b>Ecology And Biodiversity</b>	As per secondary sources, a total of 137 floral species belonging to 56 plant families have been listed in the study area. Based on the number of species, the most important plant families reported in this region are; Euphorbiaceae, Fabaceae, Poaceae, Apocynaceae, Rhamnaceae, Lamiaceae, Rubiaceae, Malvaceae, Caesalpinaceae etc.
	There is no wildlife sanctuary/biosphere reserve/national park present within 10 Km radius of the study area. One schedule-I specie was observed during study. Subsequently, a budget of Rs. 5.00 Lakhs has been earmarked for conservation of wildlife.
<b>Socio Economic</b>	The existing project will provide positive impact to the nearby area. The project will provide direct employment, which will be hired through the nearby villages.

#### 4. ANTICIPATED ENVIRONMENT IMPACT AND MITIGATION MEASURES

The proposed mining operations are not anticipated to raise the concentration of the pollutants beyond prescribed limits. However, the mitigate measures are suggested to control harmful impacts of pollutants, like the plantation of trees along haul roads, especially near settlements, to help to reduce the impact of dust on the nearby villages; regular water sprinkling on unpaved roads to avoid dust generation during transportation etc. There are one species of Schedule I observed during the study period hence, for the same conservation plan was prepared. Subsequently, a budget of Rs. 5.0 Lakhs has allotted for the conservation of wildlife species. The mining of Limestone is likely to increase the per capita income of local people by which the socioeconomic status of the people will be improved. The local people have been provided with either direct employments or indirect employment such as business, contract works and development work like roads, etc. and other welfare amenities such as medical facilities, conveyance, free education, drinking water supply etc. Except dust generation, there is no source which can show a probability for health related diseases. Regular water sprinkling will be done with sprinkles mounted tankers and dust masks will be provided to the workers. All workers will be subjected to a medical examination as per Mines Rule 1955 both at the time of appointment and at least once in a year.

## **5. ANALYSIS OF ALTERNATIVES**

We have analyzed all the option for alternatives of the Limestone Mining Project. Since it is an existing and mineral specific project therefore, analysis of alternative site is not applicable.

## **6. ENVIRONMENTAL MONITORING PROGRAM**

TANCEM has formulated well laid-out Environmental Policy, wherein preservation of environment has been accorded a most strategic and prime position. The various protocol procedures in connection with communication channels upwards and downwards, for dealing with violations or departures in environmental standards involvement of Board of Directors as well as shareholders about such incidences, etc, have been described in detail in chapter-6.

Regular monitoring of implementation of various control measures in respect of air quality, meteorology, water quality, noise levels, biological status, land environment, socioeconomic factors, occupational health, etc. is most important to ensure that the project operations do not deteriorate the environmental status of the area at any point of time and environmental quality in respect of above parameters are kept well within the statutorily sustainable levels, as prescribed by CPCB, MOEF&CC and State Pollution Control Board.

A full-fledged environment cell is operating in the Kallankurichi Limestone mine. This cell 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 programmes, social development schemes, construction of garland drains, etc. in the cement plant and all the working mines in the area.

## **7. ADDITIOINAL STUDIES**

M/s Tamil Nadu Cement Corporation Limited has formulated a disaster management plan for Emergency Preparedness & Responses.

The salient features are elaborated as below.

- Emergency response Organization
- Communication System
- Action on the site
- Facilities available at site.

## **8. PROJECT BENEFITS**

The management will recruit the semi-skilled and unskilled workers from the nearby villages. The project activity and the management will definitely support the local Panchayat and provide another form of assistance for the development of public amenities in this region. The company management will contribute to the local schools, dispensaries for the welfare of the villagers. It is proposed to plant 119100 no.s till 5<sup>th</sup> year. The officers of the State pollution control Board will strictly monitor the compliance of the lease holder in this regard.

## **9. ENVIRONMENT MANAGEMENT PLAN**

### **9.1 AIR QUALITY MANAGEMENT**

- Proper mitigation measures like water sprinkling on haul roads will be adopted to control dust emissions.
- To control the emissions regular preventive maintenance of equipments will be carried out on contractual basis.
- Plantation will be carried out along approach roads & mine premises.
- It shall be ensured that all transportation vehicles carry a valid PUC certificate.

### **9.2 WATER MANAGEMENT**

No waste water will be generated from the mining activity of minor minerals as the project only involves lifting of over burden from mine site.

### **9.3 NOISE MANAGEMENT**

- Periodical monitoring of noise will be done.
- No other equipments except the Transportation vehicles and Excavator (as & when required) for loading will be allowed at site.
- Noise generated by these equipments shall be intermittent and does not cause much adverse impact.
- Plantation will be carried out along approach roads. The plantation minimizes propagation of noise and also arrest dust.

### **9.4 SOLID WASTE MANAGEMENT**

No solid waste will be generated from the said mining operations.

### **9.5 OCCUPATIONAL HEALTH & SAFETY**

- Dust masks will be provided as additional personal protection equipment to the workers working in the dust prone area.
- No, occupational health hazards is reported till date from this activity.
- Workers are informed, kept aware and trained about occupational health hazards, due to such activities and preventive measures.
- Workers health related problem if any, will be properly addressed.

## **10. Conclusion**

As discussed, it is safe to say that the project is not likely to cause any significant impact on the ecology of the area, as adequate preventive measures will be adopted to contain the various pollutants within permissible limits. Green belt development around the area will also be taken up as an effective pollution control technique, as well as to control the pollutants released from the premises of the propose mine. The project will throw opportunities to local people for both direct and indirect employment. The proposed mining operation in the state will not only fetch income to the state exchequer but also ensure healthy development. Illegal mining and un-organized mining poses a much bigger health hazard where as organized mining under ML facilities to undergo periodic health check-ups. At present agriculture is the main occupation of the people living in the study area. Due to mining project the occupational pattern of the people in the area will change making more people engaged in industrial and business activities there by leading to urbanization. It is expected that education, health, housing, water and electricity etc facility will improve to due to this mining project and associated industrial and business activities. A total amount of Rs. 470000 has been allocated for Environment Remediation Plan.