
PROPOSED TERMS OF REFERENCE FOR EIA STUDIES

INTRODUCTION

M/s. Tamil Nadu Cements Corporation Limited belong to Government of Tamil Nadu enterprise is having two cement units, one at Alangulam and another at Ariyalur. The installed capacity of the Ariyalur cement unit is 5 LTPA. It is a modern dry process plant. TANCER is having a future proposal to expand the capacity of Ariyalur works from 5 LTPA to 10 LTPA.

Ariyalur unit is having four mining leases to a total extent of 1510.91 acres or 611.70 -hectares under three mining leases. These three leases (GO No.344, 456 and 469) are contiguous operated in the name of Kallankurichi limestone mines.

Kallankurichi Limestone Mines (G.O.Ms No. 456), is located Near Villages Periyagalur, Kallankurichi, Ameenabad (Pit (IV)) & Khairulabad, Tehsil & District: Ariyalur, State: Tamil Nadu, having an area to an extent of 194.16.5 Ha, with Cement grade limestone production capacity of 0.28 MTPA. The land is of Govt. waste land and private land.

The Mine Lease area falls on Survey of India Toposheet No. 58 M/4. The ML area is bounded between;

Latitudes: 11° 07' 05" N to 11° 10' 56" N
Longitudes: 79° 06' 26" E to 79° 07' 43" E

Approval for the proposed modified mining plan along with progressive mine closure plan will be obtained via letter no. TN/ALR/MP/LST-1795-52/399, Dated: 12/07/2012 from IBM prepared under Rule 12(3) of MCDR 1988.

As per approved mining plan the total mineable reserves are estimated as 5.293 million metric tonnes and life of mine as per present production capacity is estimated as 28 years. Limestone deposits are available in nearby areas, for which mining lease can be obtained in due course to enhance the life of mine. The method of mining is highly mechanized opencast method.

The environmental studies are being conducted to assess impacts due to the proposed Limestone mine. The environmental impacts assessment report shall include following components:

GENERIC STRUCTURE OF EIA REPORT

The generic structure of the EIA Report will be as per the MoEF, EIA Notification dated 14th September 2006, as described below:

All documents will be properly referenced with index and page numbers.

Chapter 1	INTRODUCTION
1.1	Purpose of the report,
1.2	Identification of nature, size and location of the project,
1.3	Introduction of project proponent
1.4	Description of site and surrounding environment, Location maps, Importance of project to the country and region, and Scope of EIA study (as per TOR approved by MOEF)
Chapter 2	PROJECT DESCRIPTION
The description of the project aspects that are likely to induce environmental effects shall be included. Following details shall be elaborated:	
2.1	Type of project
2.2	Need for the project
2.3	Location (maps showing general location, specific location, and project boundary & project site layout),
2.4	Method of Mining
2.5	Size or magnitude of operation
2.6	Project description including drawings showing project layout, components of project etc. Schematic representations of the feasibility drawings which give important information.
Chapter 3	DESCRIPTION OF ENVIRONMENT
3.1	Base line information shall include: Study area, period, components & methodology
3.2	Establishment of baseline for valued environmental components.
3.3	Base maps of all environmental components
3.3.1	AIR ENVIRONMENT
3.3.1.1	Identify micro-climatic zones depending upon topography and wind field data for data collection.
3.3.1.2	Hourly meteorological data collection on Wind direction, Wind Speed, Temperature and Relative Humidity

3.3.1.3	Air quality will be monitored in core and buffer zone of the project site as per the frequency & methodology stipulated in National Ambient Air Quality standards issued by MoEF, vide its Notification No. G.S.R 826(E), Dated: 16.11.2009. The meteorological data of the proposed project area along with wind rose diagrams for the corresponding season of the previous year will be obtained from the nearest IMD station, prior to identification of air quality monitoring network.
3.3.1.4	Base line Ambient Air Quality on PM ₁₀ , PM _{2.5} , SO ₂ , NO _x and CO at different locations (min. 4 locations) in and around the ML area, with a minimum of 2 locations at the project site and others in upwind, downwind and cross-wind directions. All the sensitive receptors will be covered in the air quality monitoring programme. Data shall be collected for 24 hours, twice a week at each location for 12 weeks.
3.3.2	NOISE ENVIRONMENT
The study involves monitoring of noise levels in the study area of project site in accordance with Noise Pollution (Regulation & Control) Rules, 2000, notified by MoEF	
3.3.2.1	Assessment of present and projected noise levels in the region
3.3.2.2	Identification of point, line and area sources
3.3.2.3	Prediction and evaluation of noise levels
3.3.2.4	Identification of high noise level zones and suggestions on mitigation measures
3.3.3	WATER ENVIRONMENT
3.3.3.1	Identification of water bodies in the study area
3.3.3.2	Identify present and future use of water
3.3.3.3	Data on water table of the area
3.3.4	LAND ENVIRONMENT
3.3.4.1	Assessment of existing land use pattern and land quality
3.3.4.2	Preparation of inventory of waste and reject disposal sites
3.3.4.3	Identification of appropriate sites for waste disposal
3.3.4.4	Present and post mining land use details of the mining lease area
3.3.5	BIOLOGICAL ENVIRONMENT
3.3.5.1	Collection of information on flora and fauna in the study area
3.3.5.2	Identification of rare, threatened, vulnerable and endangered species, if any, in the region
3.3.5.3	Collection of ecological information in the study area
3.3.6	SOCIO-ECONOMIC ENVIRONMENT
3.3.6.1	Collection of secondary data on village wise population. Sex ratio, literacy, number of households and percentage of main workers
3.3.6.2	Collection of primary information on infrastructure facilities in the study area

3.3.6.3	As a social obligation to uplift the socioeconomic condition of the people of mining affected area, a socio-economic survey would be conducted. Survey will be based on primary data collection through preparation of questionnaire and personal interview. After the survey and data analysis, development gaps will be identified and need based plan will be prepared which will be implemented during the project period.
3.3.7	WASTE GENERATION
3.3.7.1	Solid waste from mining and processing operations, their quality and quantity (overburden, low-grade ore etc.) Quantity and quality of associated minerals and possible recovery
3.3.7.2	Top soil quantity , quality and its management
3.3.7.3	Recovery and recycling possibilities
3.3.7.4	Site features of locations of waste storage and disposal
3.3.7.5	Leaching properties of overburden and other solid waste
3.3.7.6	Any specific inputs which are likely to be added the site and its surroundings. Salient feature of the area, which require specific study
Chapter 4	ANTICIPATED IMPACTS AND MITIGATION MEASURES
This chapter shall describe the likely impact on each of the identified environmental component by adopting methods such as mathematical model, empirical method, and reference of previous studies etc., Details of mitigation measures proposed in the project (site specific) to minimize the adverse effect, shall be discussed. The information shall be cover mine development, operation and closure phases of the project, as applicable	
4.1	AIR ENVIRONMENT
Impact of mineral transportation within and outside the mine lease area. The entire sequence of mineral production including blasting, drilling etc, transportation, handling, transfer of minerals and wastes and the impacts on air quality is to be shown in a flowchart with specific points where fugitive emissions can arise and specific pollution control / mitigation measures are proposed to be put in place. The adequacy of roads existing in the area and if new roads are to be laid the impact of the construction of roads.	
4.1.1	Anticipated Impact
4.1.1.1	Emission Inventory of PM ₁₀ , PM _{2.5} , SO ₂ , NO _x and site specific pollutants
4.1.1.2	Prediction of fugitive dust emissions due to mining activities like drilling, blasting, loading and transportation
4.1.1.3	Impact of fugitive dust emission on flora and fauna
4.1.1.4	Prediction of impact on ambient air quality using appropriate mathematical model (area, point and line sources). Description of model, input requirements and reference of derivation. Isopleths distribution of major pollutants and their analysis and presentation in tabular form/base map

4.1.2	Mitigation Measures
4.1.2.1	Measures to reduce the emissions of pollutants during drilling, blasting, loading, transportation and etc to maintain the air quality
4.1.2.2	Adoption scientific mining methods to reduce dust emission from point and line source
4.1.2.3	Planned green belt development
4.2	NOISE ENVIRONMENT
4.2.1	Anticipated Impact
4.2.1.1	Prediction of noise levels at different representative monitoring stations
4.2.1.2	Impact on ambient noise level due to excavation, transportation, processing equipments and ancillaries
4.2.2	Mitigation Measures
4.2.2.1	Measures for noise abatement including point source and line source
4.2.2.2	Lay out planning to minimize the impact on receiving environment
4.2.2.3	Planned preventive maintenance
4.2.2.4	Selection of low noise generating mining machinery and methods
4.3	WATER ENVIRONMENT
Impact of mining on hydrology, changes of natural drainage, diversion and channeling of the existing water courses flowing through the mine lease and adjoining area and its impacts on existing users and mine operations. Impact of water drawl and mine water discharge on the hydrogeology and use of groundwater regime in the core zone and buffer zone are to be detailed out.	
4.3.1	Anticipated Impact
4.3.1.1	Impact on groundwater regime /streams / lake / springs due to mining, to be assessed from hydro-geological study
4.3.1.2	Impact of water drawl on surface and groundwater resources
4.3.1.3	Impact on surface and groundwater quality due to discharges from mining, leachate from solid waste dumps etc
4.3.2	Mitigation Measures
4.3.2.1	Measures to minimize contamination of surface and groundwater
4.3.2.2	Construction of gully checks, sedimentation ponds, settling tanks, etc.
4.3.2.3	Slope stabilization by constructing retaining walls, vegetation etc,
4.3.2.4	Wastewater treatment for sewage, workshop etc
4.4	LAND ENVIRONMENT
4.4.1	Anticipated Impact

4.4.1.1	Impact on topography, drainage pattern, land use with respect to agriculture, forestry, built up area etc
4.4.1.2	Impact on soil quality and agriculture
4.4.1.3	Soil erosion
4.4.1.4	Subsidence
4.4.1.5	Visual Impact on surrounding environment
4.4.2	Mitigation Measures
4.4.2.1	Plan for restoration / rehabilitation of mined-out area
4.4.2.2	Technological measures to prevent soil erosion from core and buffer zones
4.4.2.3	Plantation / afforestation of local varieties of plants
4.4.2.4	Measures to control and conserve runoff from various locations
4.4.2.5	Landscaping, plantation, afforestation to minimize adverse visual and noise impact
4.5	BIOLOGICAL ENVIRONMENT
4.5.1	Anticipated Impact (Flaura & Fauna)
4.5.1.1	Impact on terrestrial biodiversity
4.5.1.2	Impact on flora and fauna due to air emissions, noise, vibration, illumination, vehicular movement, waste water discharges, changes in land use, etc
4.5.2	Mitigation Measures
4.5.2.1	Green belt and its raising schedule
4.5.2.1	Progressive afforestation in overburden, reclaimed mined out areas
4.6	SOCIO-ECONOMIC ENVIRONMENT
4.6.1	Anticipated Impact
4.6.1.1	Positive and negative impacts on present status of livelihood in the area
4.6.1.2	Impact on the cropping pattern and crop productivity in the buffer zone
4.6.1.3	Impact on community resources such as grazing land
4.6.2	Mitigation Measures
4.6.2.1	Training to locals for employment in the project
4.6.2.2	Employment opportunities and access to other amenities such as education, healthcare facilities to be extended to locals
4.7	WASTE GENERATION (MINE WASTES)
4.7.1	Anticipated Impact
4.7.1.1	Impact of runoff from overburden, top soil, low-grade ore and other stock piles on water bodies (siltation, contamination etc)

4.7.1.2	Impact on surrounding agricultural land
4.7.1.3	Impact on groundwater quality due to leachate
4.7.1.4	Sliding of waste dump
4.7.1.5	Impact of hazardous wastes and liquids
4.7.2	Mitigation Measures
4.7.2.1	Land reclamation and mine closure plan
4.7.2.2	Overburden dumps stabilization to minimize impact due to runoff
4.7.2.3	Overburden utilization for back-filling and other purposes
4.7.2.4	Measures to control runoff from waste dumps and mining surface
4.7.2.5	Hazardous waste management as per regulatory guidelines
Chapter 5	ANALYSIS OF ALTERNATIVES (TECHNOLOGY & SITE)
This chapter gives details of various alternatives both in respect of location of site and technologies to be deployed	
Chapter 6	ENVIRONMENTAL MONITORING PROGRAM
In order to focus on environmental management during project implementation and execution stage, the project proponent is required to spell out detailed plan and shall be including the following:	
(a)	Monitoring of quality of water, air, noise, vibration and occupational health status of project personnel and surrounding habitations
(b)	Planned monitoring program to evaluate the effectiveness of various / specific aspects of technological / mitigation measures
(c)	Environmental audit of various activities including budgeting and financial management with reference to environmental management plan
(d)	Plantation monitoring program to ensure survival and growth rate of plantations
(e)	Analysis of data, its interpretation and evaluation (any additional studies to be carried out if required)
(f)	Mine closure plan along with the fund requirement for implementation of the activities proposed there under
Chapter 7	ADDITIONAL STUDIES
7.1	Analysis of alternatives
This is site specific project. Mining activities are carried out based on local geology and availabilities of mineral. Different alternative for mining technologies are discussed and most economical eco-friendly options are selected	
7.2	Public hearing
Public hearing with the issues raised by the public and the response of the project proponent in tabular form shall be discussed	

7.3	Risk Assessment (RA) and Disaster Management Plan (DMP)
Mining activities are associated with risk relating to hazards and accidents. Therefore risk analysis and risk mitigation shall be clearly indicated in the report. This shall include the following:	
(a)	Identification and type of risk associated with mining (slope failure, subsidence, fly rock fragments, fires, toxic / hazardous / flammable gas release / explosion, inundation etc.)
(b)	Details of safety measures to prevent accident and disaster
(c)	Disaster management plan and emergency response system with proper organizational setup to deal with such situation
(d)	Occupational health risks
7.4	Natural Resource Conservation
Plan of action for conservation of natural resources and recycle waste materials due to the project activity in the construction and operational phase of the project are to be discussed. Energy efficiency measures in the activity are to be drawn up.	
Chapter 8	PROJECT BENEFITS
This section describes the improvements in physical and social infrastructure. It details out the employment potential and other benefits that are accrued	
Chapter 9	ENVIRONMENTAL MANAGEMENT PLAN (EMP)
(a)	Administrative and technical set up for Environmental Monitoring
(b)	Mechanism of self monitoring for compliance with environmental regulations
(c)	Institutional arrangements proposed with other organizations/ Govt. authorities for effective implementation of proposed environmental management plan
(d)	Integrating in the environmental management plan measures for minimizing use of natural resources – water, land, energy etc
(e)	Description of mitigation measures incorporated into the project to meet environmental standards, environmental operating conditions
Chapter 10	SUMMARY AND CONCLUSIONS
Summary shall provide the overall justification of the project and explains how the adverse effects have been mitigated.	
Chapter 11	DISCLOSURE OF CONSULTANTS ENGAGED
The team of consultants/ experts engaged in this project shall be detailed in this chapter	
