

EXECUTIVE SUMMARY

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT UNDER VIOLATION CASE

“LIMESTONE MINE”

S.F.No:24/1C (P), 24/2 (P), 30/2, 30/3, 30/4, 30/5,
30/6, 30/7, 30/8 & 34/15,
Over an extent of 2.37.25 Ha of Pandapuli Village,
Sankarankovil Taluk, Tirunelveli District,
Tamil Nadu.

Project Cost – Rs 30 Lakhs

EMP Cost – Rs.6 Lakhs

M/S. Murali Enterprises,

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1. Executive Summary

M/s. Murali Enterprises of Limestone Mine over an extent of 2.37.25 Ha, in S.F. Nos.24/1C (P), 24/2 (P), 30/2 – 30/8 & 34/15, is located in Pandapuli village of Sankarankovil Taluk, Tirunelveli District. The area is marked in the survey of India (SoI) Toposheet No.58 G/11. The area lies between northern latitude of 09° 19' 43.63" to 09° 19' 47.93" N and eastern longitude from 77° 32' 54.51" to 77° 33' 1.37" E. Initially the mining lease was granted in favour of M/s.Lovely Chemicals vide G.O.(3D) No 1390 INDS, dated 12.10.1981 for a period of 3 years. The lease was first renewed for a period of 4 years with effect from 10.05.1985 to 09.05.1989 by vide G.O. Ms. No.445 Inds, dated 13.05.1985 based on the set a side order by the Government of India on the deemed rejection of the renewal application on the court orders enabled the company to carry on the mining operations. The second renewal was granted by vide G.O. Ms. 524 Inds, (MMD2) Dept., dated 30.12.1991 for a period of 10 years from 10.05.1989 to 09.05.1999. The third renewal was granted by vide proceedings No.56/MM4/2005, dated 30.06.2009 for a period of 20 years from 10.05.1999 to 09.05.2019 and the lease deed was executed on 23.11.2009.

Subsequently, the above lease was transferred to Mr. S.A. Murali., M/s Murali Enterprises by vide G.O. Ms. No. 153 Inds (MMA2) Dept., dated 01.11.2010, and the lease deed was executed on 14.01.2011.

The Mining Plan (2005-2006 to 2009-2010) was approved by Indian Bureau of Mines vide letter No. TN/TNL/MP/LST-1574-Mds, dated 14.02.2005. The Scheme of Mining (2010-11 to 2014-15) was approved by Indian Bureau of Mines vide Letter No. TN/TNL/MP/LST-689-Mds, dated 30.04.2012 and it is valid up to 31.03.2015.

Since the Scheme of Mining expired on 31.03.2015, the final scheme of mining (2015-16 to 2019-20) up to 09.05.2019 and Review of Mining Plan 2019-20 to 2023-24 along with PMCP was prepared and submitted to Indian Bureau of Mines by M/s Murali Enterprises which has received Approval under Rule 12(2) and 23(B) of MCDR, 1988.

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1.1 DETAILS OF THE MINING AREA

A) The area is marked in the Survey of India Topo Sheet No.58G/11.

G.O. Order No	Date of grant	Extent (Ha)	Date of Execution	Period of Lease	Date of expiry
G.O.No: 1390/Industries Department	12.10.1981	2.37.25	10.05.1982	Total 34 years of renewed period And continue for 50 years as per amended MMDR Act, 2015	09.05.2019 And deemed to continue up to 09.05.2032

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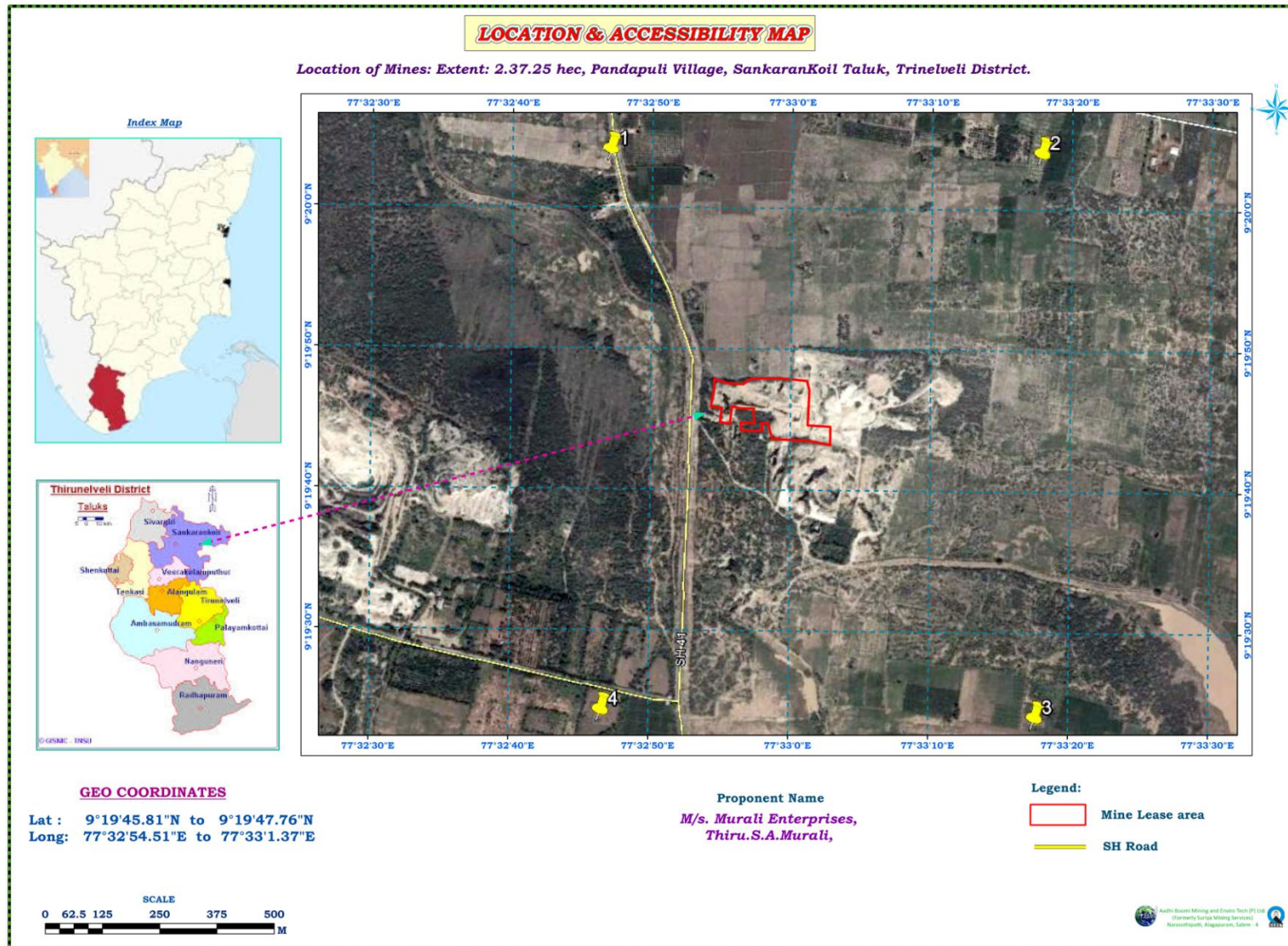


Fig No: 1 Google Image showing the Location of the quarry

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Table No: 1.Project Details

Details of the Study Area		
Latitude	09°19'43.63" to 09°19'47.93" N	
Longitude	77°32'54.51" to 77°33'1.37" E	
SOI Toposheet	Toposheet No. 58 G/11	
Topography	The mining lease area is almost a flat Area. Elevation is 140-142m above MSL. An average height is of 1-2m from the ground level.	
Ownership/Occupancy	PattaLand	
Village	Pandapuli	
Taluk	Sankarankoil	
District	Tirunelveli	
Accessibility		
Nearest Village	Uralipatti – 2 km - 3096 (Population)	
Nearest City	Town	Rajapalayam - 16 Km
	City	Tirunelveli - 75 Km
	District Head Quarters	Tirunelveli
Nearest Highway	State Highway –SH-41- 16(NE)	
Nearest Railway Station	Sankarankovil Railway Station – 16km (S)	
Nearest Airport	Madurai Airport – 90km	
Nearest Seaport	Tuticorin – 125km (SE)	
Important Places		
Interstate Boundary	There is no interstate boundary located within 10 km radius.	
Archaeologically Important Sites	None within 10km radius.	
Nearest water bodies/river/sea	One Kanmoi is located within 500 m radius in west side.	
National Parks/Wildlife Sanctuaries	There is no Wildlife Sanctuary/National Park within 10 km radius from the project site area under the Wildlife (Protection) Act, 1972.	
Reserve Forest	There is no Reserve Forest situated around 10 km from the site. Hence the area does not attract the Forest Conservation Act, 1980.	
Coastal Zone	The mining area is located more than 100 km from sea coast. Hence, the project does not attract the C.R.Z. Notification, 1991.	
Habitations	Nadumandalam	4.99 km (NW)
	Uralipatti	2 km (S)
	Pandapuli	2 km (S)

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	Panniamalai	2.71 km (N)
	Avinchipatti	0.41 km (NW)
	Velanpatti	4.07 km (N)
Nearby Quarries	2 quarries are found in the Core zone	
Seismic Zone	Zone III	
Defense Installations	None within 10 km radius	

1.2. PROJECT DESCRIPTION

1.2.1. Physiography

The mining lease area is almost a flat Area. Elevation is 140-142m above MSL. An average height is of 1-2m from the ground level. The limestone deposit is partly concealed below the morum soil of about 1-2m thick. This area is bestowed with varied agro climatic condition from semi-arid to sub-tropical supporting varied agro eco systems, conducive for the cultivation of wide range of agricultural and horticultural crops. No major river is found nearby. A small pond is found nearby the site.

1.2.2. Drainage Pattern

There are no perennial water sources within the lease hold area. Few Ponds are situated about 60 meters and 350meters away on western and southern sides respectively. No pumping is required to pump out ground water as the mining extends only 16m of depth and the ground water is found to be fluctuated between 30-32mts in a year. There is no impact on natural drainages from this mine. The depth of mining is 16m. The mining shall not affect the water table. No permanent pumping arrangement made for this small mine and the ground water is found to be fluctuated between 30-32mts in a year.

A diesel engine with 5 H.P capacities is kept at the mine site to meet any eventuality of bailing out the rain water to the natural drainage outside to carry out the mine working uninterrupted. Dust suppression and green belt is obtained from proponent bore wells. There is no acid drainage or any toxic elements reported.

1.2.3. Geology of the Precise Area

Tirunelveli district of Tamil Nadu is the southern part of the Indian Precambrian shield comprising a wide variety of geological formations ranging from Precambrian to recent period. Major portion of the district is covered by plain topography. North West and western portion of the district are gently sloping to undulating. Different types of Charnockites rocks and Meta sedimentary gneissic formation are distributed throughout the Tirunelveli District. They can be divided into granitoid, non-garnetiferous mica, Hornblende gneisses and mixed gneisses associated with migmatite.

There is migmatite assemblage of garnetiferous biotite gneisses (Khondalitic) and garnetiferous quartz-feldspathic granulites. The major litho-stratigraphic units in the study area of limestone are available at several places in the district. The limestone is crystalline deposit Ramayanpatti, Thalaiyuthu, Padmaneri and Pandapuli area. The tertiary formation lies on the Archaean complex with marked unconformity, consist of calcareous sandstone and shale limestone. These are medium to fine grained, compact in nature. The thickness of the formation varies from few meters to few tens of meters.

1.3. METHOD OF MINING

Open cast mining by other than mechanized mining is adopted to raise the production in this area. As the mineral occur as outcrops and exposed mostly in working pit as well as at the surface and hence there is no separate development work involved except side burden to win the mineral. Drilling is carried out using hired tractor attached with compressor and their team and blasting carried out departmentally with qualified blaster\Manager. The Limestone is broken into the required size and sorted out in to various grades based on color and size. The rejects and waste are being removed manually using tippers. The useable minerals are transported to their cement factory or crushing plant in accordance with grade. The cement grade limestone is transported to Ramco cement factories, Tirunelveli for using public carriers on hire basis.

Table No: 2. Mining Details

Particulars	Details
Method of Mining	Open cast method of mining by Semi-mechanized method
Geological resources	252436 MT
Mineable reserves	177142 MT
Production	Average Production: 16176 MT/annum (70% of ROM) Maximum Production: 16306 MT/annum
Topsoil	Nil
Rejects	34664MT
Depth of Mining	16m
Water Table	30-32m bgl
Overall Pit Slope	45°
Scheme Period	2019-2020 to 2023-2024
Project Cost	Rs 30 Lakhs
EMP Cost	Rs. 6 Lakhs

1.4. DESCRIPTION OF THE ENVIRONMENT

1.4.1. Base line environmental study

Baseline Environmental Studies have been conducted to determine the existing status of various Environmental attributes viz., Climatic and Atmospheric Conditions, Air, Water, Noise, Soil, Hydro geological, Land use pattern, Ecological and Socio-Economical environment, prior to setting up of the project.

An area, covering a 10km radial distance from the project site is considered as the study area for the purpose of the baseline studies. As part of Environmental and Social Impact Assessment, this study was undertaken for a period of three months from December 2017 to February 2018.

Table No: 3. Baseline Data

Particulars	Details	Standards
Meteorology (Dec 1st 2017 – Feb 28th, 2018)		
Rainfall (Avg.)	917.86mm per annum	--
Temperature (Avg.)	Normal: 24.4°C and 27.1°C. Max: 38.5°C.	--
Relative Humidity	55 and 65%	--
Wind Direction	SW to NE	

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Ambient Air Quality (NAAQS)		
PM ₁₀	44.95-56.98µg/m ³	100 µg/m ³
PM _{2.5}	22.56-31.65µg/m ³	60 µg/m ³
SO ₂	6-6.95µg/m ³	80 µg/m ³
NO _x	5.48-8.7µg /m ³	80 µg/m ³
Noise Level (CPCB Standards)		
Day time (6:00 am - 10:00 pm)	Core zone & Buffer zone – 40.4-46.7 dB (A)	Industrial Area Day Time - 75 dB (A) Residential Area Day Time – 55 dB (A)
Night time (10:00 pm - 06:00 am)	Core zone & Buffer zone –36.1-38.2 dB(A)	Industrial Area Night Time – 70 dB(A) Residential Area Night Time – 45 dB (A)
Water Quality IS 10500:2012 (Desirable limits)		
pH	7.6 to 8.7	6.5 to 8.5
TDS	79-1590 mg/l	500 mg/l
Total Hardness as CaCO ₃	52-520 mg/l	200 mg/l
Soil Quality		
pH	7.56-9.15	Neutral to moderately alkaline
Bulk density	1.64-2.29 g/cc	Favorable physical condition for plant growth.
Hydro Geology		
Depth of Mining	16m bgl	Quarrying activity 16m above ground water table
Water Table	30-32m bgl	

1.5. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

1.5.1. AIR ENVIRONMENT

The air borne particulate matter is the main air pollutant by opencast mining. The mining operation will be carried out by adopting semi-mechanized methods which involves drilling, blasting, excavation, loading, hauling and unloading. Apart from above, there will be other activities associated viz transportation of mineral and waste, stocking of rejects and dump management within the mine lease area that may contribute to wash out, slope failure, leachates and other related pollution. The existing Ambient Air Quality status (AAQ) has been monitored for parameters PM₁₀, PM_{2.5}, SO₂ and NO_x at 5 different locations around 10km radius. Ambient air quality monitoring was carried out at a frequency of two days per week at each location for three months at 8 hour continuously.

Limestone mining is carried out by opencast fully mechanized method. The air borne particulate matter generated by ore and handling operations, and transportation of limestone is the main air pollutant. The emissions of Sulphur dioxide (SO₂), Oxides of Nitrogen (NO_x) contributed by diesel operated excavation/loading equipment and vehicles plying on haul roads are marginal. Prediction of impacts on air environment has been carried out taking into consideration proposed production and net increase in emissions.

1.5.2. NOISE ENVIRONMENT

1.5.2.1. Anticipated Impacts due to Core Zone

Noise pollution poses a major health risk to the mine workers. Following are the sources of noise in the existing open cast mine project are being observed, Drilling, Blasting, operation of vehicles during transportation of mineral. A preliminary reconnaissance was undertaken to identify the major noise generating sources in the area. Five locations (Core Zone & in Buffer Zone) were identified based on the activities in the study area, traffic and sensitive areas like hospitals and schools maximum covering a radius of 10km.

Although the noise level due to the operation of various mining machineries is 100 dB (A), the noise level at different receptors is lower due to the distance involved and other

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topographical features adding to the noise attenuation. The noise generated by the mining activity is dissipated within the core zone. This is because of distance involved and other topographical features adding to the noise attenuation. At present there is no mining activity 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 duration. 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.

1.5.2.2. Anticipated Impacts due to Noise in Buffer Zone

Whereas the noise levels at all locations of Buffer zone were observed to be in the range of 42.1-46.7 dB (A) being well within the Residential area prescribed limit of 55 dB (A) as per CPCB Standard for Industrial Areas. The night time noise levels at all locations of buffer zone villages were observed to be in the range of 36.1-37.3 dB (A) being well within the residential area prescribed limit of 45 dB (A). The monitored noise level during the baseline data generation period within the selected villages in buffer zone was found to be within the prescribed CPCB standards which will further be reduced when more plantations within the mining area especially in the direction of habitation will be undertaken by the proponent.

1.5.3. WATER ENVIRONMENT

Mining operations can affect groundwater quality in several ways. The most obvious occurs in the mining 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 ground water. But this Limestone mine is devoid of any such impacts. Two water samples from various locations in and around the project site were collected for assessment of the physicochemical and bacteriological quality to know the baseline status of ground and surface water.

The impact due to mining on the water quality is expected to be insignificant because of no use of chemicals or hazardous substances during mining process. The water analysis

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results shows that water from core zone is bacteriological contaminated and with pretreatment process like chlorination, UV radiation water shall make it fit for drinking purposes. There is no such impact on water environment.

1.5.4. Soil Environment

Soil samples were collected from 5 sampling locations in core zone and buffer zone for analysis of the physico-chemical characteristics of the soil quality. The pH of the soil found to be neutral to slightly alkaline in nature. Soil characteristics indicate favorable condition for plant growth. There is only negligible quantity of top soil generated for the entire life of the mine. It is being used for plantation purpose. Waste dump will accommodate the top soil at the end of life of mine.

1.5.5. Waste Dump

The waste rocks to be generated from the mine will be fragmented gneisses and rejects of patches, cracks and small size blocks. The site selected for dumping waste and Limestone rejects on the barren area and stable, therefore no chance for instability of dumps and washouts. The dump quantity is 34664 MT of mineral rejects and 14760 MT of waste(weathered) , it shall be dumped Southeast of specified lease area as proposed in the mining plan and back filled at the end of mining over the mined out area.

1.5.6. BIOLOGICAL ENVIRONMENT

There are no notified endangered species in the area, which may be affected due to the mining activities; therefore the biological environment will not have significant impact due to quarrying activity. The impact on the biological environment due to amount of dust generation is minimized by well-developed green belt in and around mining lease area. Habitat improvement programme will include plantation of various plant species like *abutilon*, *tridaxpro cumbens*, *Acacia nilotica* and *Azadirachta indica* etc. These species will help to provide habitat for fauna species, especially birds and butterflies and also increase the species diversity and maintain the naturalness of the surrounding area. It is strongly recommended that the loss of plant in each year will be counted and again planted in the subsequent plantation. The dead plants will be replaced by saplings of a new plant on the location. The plant should be planted taken from the nursery, where the survival rate is high.

1.5.7. LAND ENVIRONMENT

Limestone quarry will result in disturbance of the land use pattern of the mine lease area. The land degradation is unavoidable during mining activities like excavation, overburden dumping, soil extraction etc. Land requirement for the project has been assessed considering functional needs. So reclamation of mined out land will be given due importance as a step for sound land resource management. No release of toxic elements into the ground. No adverse impact is anticipated on land use of buffer zone associated due to the mining activity, as all the activities will be confined within the project site. The mining operations will impact the land usage and land aesthetics of mine lease area.

Table No: 4. Land Use pattern of the Core zone

S.No	Description	Existing LU (Ha)	Proposed LU (Ha)
1	Area under Mining	1.42.00	1.51.72
2	Waste Dump	0.07.50	0.13.80
3	Mine Roads	0.03.00	0.04.00
4	Safety and Area under plantation	0.70.75	0.64.73
5	Infrastructure	0.01.00	0.01.00
6	Storage of topsoil	----	---
7	Mineral Storage	----	---
8	Processing unit	-----	---
9	Virgin Area	0.13.00	0.02.00
Total		2.37.25 Ha	2.37.25Ha

1.5.8. SOCIO ECONOMIC ENVIRONMENT

The mining lease area does not cover any habitation. Hence the mining activity does not involve any displacement of human settlement. No public buildings, places, monuments etc., exist within the lease area or in the vicinity. It is the non-mining operation will not disturb/ relocate any village or need resettlement. Thus no adverse impact is anticipated.

The proposed of the mine with enhanced capacity provided employment to 34 persons which will aid in the overall social economic development of the region.

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The proponent help in socio economic development of the village by providing education facilities to children's, procuring sports equipments, welfare amenities like drinking water to school, road facilities to villages and employment opportunities to nearby villagers. CSR budget is allocated as 2.5% of the profit.

Table No: 5. Post Project Environmental Monitoring Program

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&CC to control fly of dust. ○ Labour engaged in such dust prone areas should be provided with safety devices like ear muff, mask, and goggles as per the MMR, 1961 amendments and circulars of DGMS. ○ 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

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			<p>out as per the Factories Act</p> <ul style="list-style-type: none"> ○ 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 ○ Desalting 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
		General measures	<ul style="list-style-type: none"> ○ Regular monitoring and analysing 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.

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			<ul style="list-style-type: none">○ 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
		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.

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4	Vibration	Blasting	<ul style="list-style-type: none">○ Specific charge pattern has to be designed by proper trial vibration studies with varying charge ratios.○ Milli second detonators shall be used preferably 25–50ms per delay to control vibrations○ Diamond wire saw cutting and chemical blasting shall be used to cut the blocks into saleable dimensions○ 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○ Top soil should not be mixed with other waste or reject materials. It should be conserved by judicious utilization in the quarry premises○ Garland drains will be provided around the mine and dumps to arrest any soil from the quarry 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	<ul style="list-style-type: none">○ 1m height parapet shall be constructed for dumps more than

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		Dumps	<p>6m height along the toe to prevent and control wash out from dumps entering into natural system through rain water</p> <ul style="list-style-type: none"> ○ 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 ○ Dump should be terraced for every 5m height and stabilized
7	Plantation	Mine lease boundary 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 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	-	<ul style="list-style-type: none"> ○ Good maintenance practices will be adopted for machinery and

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	Economic		<p>equipment, which will help to avert potential noise problems.</p> <ul style="list-style-type: none"> ○ 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. ○ An emergency preparedness plan will be prepared in advance, to deal with fire fighting, 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). Insurance will be taken in the name of the labourers working in the quarry. Workers involved in quarrying work shall be provided protective equipments such as Thick Gloves, Goggles, ear plugs, safety boot wears, etc...

1.6. ANALYSIS OF ALTERNATIVES

The limestone mine is site specific and also operating mine. The selection of site is based on the following considerations which are feasible in terms of location, deposit characteristics, availability of reserves, percentage recovery, road facilities, labor availability, requirement of health and safety and environmental concerns, production scheduling, scope of mechanization/automation, land reclamation, operating and capital cost estimates. This project site provides direct and indirect employment thereby improving the economic standard of people in the surrounding villages. It is a site specific project. No alternative is suggested.

1.7. ENVIRONMENTAL MONITORING PROGRAMME

M/s. Murali Enterprises ensure the implementation of the measures within the mine area and carryout efficient monitoring. **M/s. Murali Enterprises** continue to monitoring the environmental parameters as per TNPCB/IBM/MoEF&CC guideline.

Table No: 6 Post Project Environmental Monitoring Program

S. No	Environment Attributes	Location	Monitoring		Remarks
			Duration	Frequency	
1	Meteorology and Air Quality	Minimum 1 site in the project impact area	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	5 locations (One station in the project site and at least four in nearby residential, commercial or industrial areas, one in the upwind and one station on the downwind direction).	8 hours	Yearly Once	Fine Dust Sampler and Respirable Dust Sampler

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3	Water Pollution Monitoring	5 locations (Core Zone-1 and Buffer Zone-4) Mine effluents, Set of grab samples taken in Winter season for ground and Surface water in the vicinity.	-	Once in a Year	Physico-chemical & microbiological characteristics
4	Hydrogeology	Water level in the open wells in core and buffer zone around 1km at specific wells	-	Once in 6months	Water level monitoring devices may be used.
5	Noise	5 locations (Core Zone-1 and Buffer zone-4) (Mine Boundary, High noise generating areas within the lease	24 hours	Monthly Once	Sound level meter
6	Vibration	Around the project area	-	Regularly During blasting operations	Vibration and Over pressure monitoring instrument/Digital Seismograph
7	Soil	5 locations (Core Zone-1 and buffer-4)	-	Once in a year	Physical and Chemical characteristics

1.8. PROJECT BENEFITS

The proponent **M/s. Murali Enterprises** is very much conscious of their obligations to society at large. Under plantation program, it is suggested to develop green belt further all along the boundary of quarry lease area. The species to be grown in the areas will be dust tolerant and fast growing species so that a permanent green belt is created. Apart from the green belts and aesthetic plantation for eliminating fugitive emission and noise control, all other massive plantation efforts will be executed with the assistance of experts and cooperation of the local community. The mining activity will create rural employment. It has been observed that local people mainly depend upon agricultural, where the income is irregular and low. The mining activity in the region will have positive impact on the social economic condition of the area by way of providing employment to the local in-habitants; wages paid to them will increase the per capita income, housing, education, medical and transportation facilities, economic status, health and agriculture by improving the life style of the people. A major part of the labour force will be mainly from local villagers who are expected to engage themselves both in agriculture and mining activities. The State Govt. for the welfare and development of the village. The proponent help in socio economic development of the village by providing education facilities to children's, procuring sports equipments, welfare amenities like drinking water to school, road facilities to villages and employment opportunities to nearby villagers. CSR budget is allocated as 2.5% of the profit.

1.9. CONCLUSION

Based on the EIA study it is observed that there will be a marginal increase in the dust pollution, which will be controlled with the effective implementation of the environment management measures as suggested in the EIA/EMP report and as may recommended by SEIAA, State Pollution Control Board, the negative impacts will be minimized to a great extent. There will be negligible impact on ambient environment & ecology due to mining activities, moreover the mining operations will lead to direct and indirect employment generation in the area.

The mining activity in the region will have positive impact on the social economic condition of the area by way of providing employment to the local in-habitants; wages

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paid to them will increase the per capita income, housing, education, medical and transportation facilities, economic status, health and agriculture by improving the life style of the people. A major part of the labour force will be mainly from local villagers who are expected to engage themselves both in agriculture and mining activities. Indirect employment opportunities to local people in contractual works like construction of infrastructural facilities, transportation of Limestone to destinations, sanitation, supply of goods and services to the mine and other community services. The State Government will also benefit directly from the existing limestone quarry, through increased revenue from royalties, excise duty and etc...

Also the proponent's Corporate Social Responsibility initiatives will have a positive impact on socio economic environment of the region.