EXECUTIVE SUMMARY

INTRODUCTION

Bistara Limestone & Dolomite Mine is owned by M/S N.M. Dubash Stone & Lime Co Pvt.Ltd. It is one of the largest suppliers of high grade Limestone to the steel plants across the country. The lessee proposes to enhance the production of Limestone and Dolomite of the mine to 3.0 lakh tonnes per annum.

The mining lease has been transferred to M/s N.M. Dubash Stone & Lime Co. (P) Ltd. on 27.06.91. The mining lease was initially granted for a period of 20 years w.e.f. 06.09.80 to 05.09.2000 and subsequently renewed for further 20 years period upto 05.09.2020. The modified Scheme of mining has been approved by IBM, Nagpur vide letter no. MP/Katni/LS/MOD.M.scheme – 02/07-08 Nagpur dated 31-07-2008 for revised target of 3.0 LTPA.

Location

The mine lease area is located within the jurisdiction of Bistara village, Tehsil-Murwara, District Katni (M.P). The mining lease area is a part of the Survey of India toposheet no. 64 A /5. Geographically the ML area falls under following co-ordinates:

Latitude	:	N 23^0 58’ 15” to 23^0 58’ 38”
Longitude	:	E 80^0 27’ 10” to 80^0 27’ 36”

PROJECT DESCRIPTION

Topography & Drainage

The mine lease area is almost flat having gentle slope towards south. The highest elevation of the lease area is 380m A.M.S.L. towards north direction and the lowest elevation is 375m A.M.S.L. in south west direction. The lease area is drained by southerly flowing non-perennial nallas originating from the foot of Kymore range confluencing in Mahanandi river in S-E of the lease area at about 10Km

Salient Features of Mining

- Mining is proposed by opencast other than fully mechanized method.
- Estimated Mineable Reserves: 16,16,364 t
- Mineable Area = 12.35 ha
- Maximum rate of production will be around 0.3 million tonnes/annum.
- Anticipated life of mine is 6 years.
- A maximum bench height of 6.0 m would be maintained. The width of the bench varies from 3m to 15m.
- The bench slope will be between 60^0 and 70^0 to the horizontal.
- Blasting will be done only in the harder pitches which cannot be directly excavated by excavator.
- Tippers will be used for loading and dumping of waste material and ore.
- Total quantum of waste is expected to be around 0.80 million m^3.
- At present total man power of Bistara Limestone & Dolomite mine is around 145.

DESCRIPTION OF THE ENVIRONMENT

Meteorology (Pre Monsoon 2008)

Sl.No	Parameters	Data
1	Hourly Maximum Temperature (0C)	44.5
2	Hourly Minimum Temperature (0C)	13.4
3	Hourly Maximum Relative Humidity (%)	94
4	Hourly Minimum Relative Humidity (%)	9
5	Predominant Wind Direction from	NW
6	Average Wind Speed (m/s)	1.22

Ambient Air Quality

The ambient air quality with respect to the study zone of 10km radius around the mine site forms the baseline information. The various sources of air pollution in the region are dust rising from unpaved roads, domestic fuel burning and vehicular traffic.

Pre-calibrated R.D. Samplers have been used for monitoring the existing AAQ status. The summary of Ambient Air Quality test results are given below.

Name of Sampling Location	Test Results (Units: µg / m3)			
	SPM	RPM	SO2	NOX
Mine Lease Area	287.6	90.1	17.4	26
Padkhuri	273.1	90.3	16.4	24.4
Kacchagawan	283.6	90.8	17.2	25.6
Karaundia	279.6	139.8	22.8	26.4
Punchhi	274.6	164.8	26.9	31.4
Jobi Kalan	287.6	172.6	28.2	32.9
Rajarwara	285.6	90.8	17.3	25.8
Pathra	273.6	164.2	26.9	32.0
*NAAQ Standard for industrial area Annual Average / 24 Hrs	360/500	120/150	80/120	80/120
**NAAQ Standard for residential area Annual Average / 24 Hrs	140/200	60/100	60/80	60/80

Noise Level

A preliminary survey was undertaken at 8 locations i.e. 2 locations in mine lease area and six locations in buffer zone during study period, to identify the major noise generating sources in the area. Summary of noise level data of different locations are given below.

Noise Levels during Study Period [Units:dB(A)]

	N-1	**N-2**	**N-3**	**N-4**	**N-5**	**N-6**	**N-7**	**N-8**
Min	71.5	72.0	67.8	68.3	68.0	68.0	67.5	67.5
Max	55.0	55.4	53.1	55.7	56.1	56.0	55.4	55.6
L_d	65.6	65.9	63.7	64.4	64.0	63.8	63.8	64.2
Standard	**75**	**75**	**55**	**55**	**55**	**55**	**55**	**55**
L_n	57.9	58.0	56.7	58.0	58.2	58.0	58.2	58.6
Standard	**70**	**70**	**45**	**45**	**45**	**45**	**45**	**45**
L_{Min}	Minimum Noise Level Recorded				**L_d**	Day Equivalents		
L_{Max}	Maximum Noise Level Recorded				**L_n**	Night Equivalents		

The major noise generating sources are mining related activities, commercial activities, traffic and blasting. The ambient noise level in and around the existing mine area is well within the statutory limits.

Traffic Density

The characteristics and volume of traffic in the buffer zone was studied during the monitoring period, on Kymore – Jhukehi road. Summary of the traffic study is given below.

Type of Vehicle	Total traffic on Jhukehi – Kaymore road (in 24hrs)
HMV	176
LMV	88
2 & 3 Whellers	143
Total	407

WATER ENVIRONMENT

Water Resources

There is no perennial source of water/river near the lease area and within the 5km buffer zone. In addition most of the water bodies are dry during summer except old worked out quarries situated within the study area, which are filled up with water. The general ground table varies from 10m to 14m. The ground water structure is mainly in the from of dug wells, bore wells and hand pumps. These are mainly used for drinking water purpose and irrigation purpose.

Water Quality

Two Surface water and Five ground water samples were collected and tested to know the water quality of the study area. Summary of the water quality results are given below.

S. No.	Parameter	Surface Water	Ground Water	Desirable limits as per IS:10500
1.	pH	7.5 – 8.5	7.1 – 7.4	6.5 – 8.5
2.	Total Dissolved Solids	119 – 128	246 – 502	500
3.	Total Hardness as $CaCO_3$	45 – 56	138 – 300	300
4.	Chloride as Cl	15 – 20	38.4 – 45.1	250
5.	Flouride as F	0.1 – 0.3	0.22 – 0.29	1.0
6.	Turbidity	21 - 32	1 - 5	5

Persual of the above table shows that physico-chemical characteristic of the samples analyzed were well within the desirable limits of the prescribed drinking water standards IS:10500.

LAND ENVIRONMENT

Land Use

The entire lease area 17.07 ha is under possession of M/s. N. M. Dubash Stone & Lime Co. Pvt. Ltd. (The Lessee).Land use of mining lease area and study area are given below.

Present Land use of ML area

S.NO.	Category	Land Use (In Ha.)
1	OB dumps	2.00
2	Excavation	8.70
3	Road	0.20
4	Infrastructure	0.40
5	Un-utilized area	4.27
6	Storage of top soil	0.40
7	Greenbelt / Afforestation	1.10
8	Others (water reservoir)	--
	Total	**17.07**

Land use in the Study area

Land use	**Percentage (%)**
Forest land	20.36%
Irrigated land	9.94%
Un irrigated land	43.56%
Cultivable waste land	15.48%
Area N/A for cultivation	10.66%
Total	**100%**

SOIL ENVIRONMENT

Soil Quality

Soil samples were collected from six locations from the core and buffer zone to evaluate the soil quality in the study area. All the samples are showing moderately fertile nature. The sampling locations have been finalized with the following objectives:-

- To determine the baseline soil characteristics of the study area.
- To determine the impact of industrialization on soil characteristics.

BIOLOGICAL ENVIRONMENT

Floral

Flora of the study area includes (neem) Azadirachta indica Sal (Shorea robusta), Gambhar (Gmelina arborea), Mahua (Madhuca indica), etc. Herbs is found sporadically all over the forest areas, some of them are, etc. Main shrubs species of this forest area are Lantana camara, Cassia tora, Dicanthium annulatum, etc.

Fauna

The presence of fauna depends on topography and vegetation in the area. The animals like Neel Gai (Boselaphus tragocamelus), Fox (Vulpes bengalensis), Hare (Lepus ruficaudatus), Jackel (Cannis aureus) etc, are found in the study area. The reptiles like snake, lizard are also found in the area. Among the birds mainly Crow (Crovus splendens), Sparrow (Athene brome), Dove, Pigeon (Columba livia) are found in the area.

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Impact on Ambient Air Quality

From the proposed expansion activity removal, handling, transportation of ore and storage of wastes will cause an additional increase in the concentration of SPM in the atmosphere. Maginal emissions of Sulphur dioxide (so2) and oxides of Nitrogen (NOX) can be anticipated by diesel operated equipments and vehicles plying on haul roads. Based on ISC-AERMOD model the maximum predicted concentrations of SPM during pick operation of mining will be < **216.31**µg/m3 within ML area and <**165** µg/m3 within study area.

Control Measures of Air Pollution

S.No.	Dust Source	Control measure
1	Haul Road	-Compaction, gradation and drainage on both sides. -Proper maintenance. -Regular water spraying.
2	Truck Movement	-No overloading of trucks. -Trucks to be covered with tarpaulin while transporting ore. -Enforcing speed limit.
4	Mine pit	-Regular water sprinkling in working areas.
5.	Plantation	-Native species of the area proposed for the plantation. -Fast growing tree species are proposed for plantation on dumps and road sides.

Impact on Noise Level

Increase in vehicles for transportation and haulage due to increase in production will add some noise level in the present monitoring level of noise specially within the active working area. The anticipated noise level at ML boundary from nearest pit boundry will be less than 55 dB(A), which is less than the prescribed limits for industrial area. No additional noise can be anticipated due to proposed mining activities at nearest habitat (about 500m from ML boundary) of Bistara village.

Control Measure of Noise Pollution

Noise levels will be kept within acceptable limits by:

- Limiting of speed of haulage vehicles/tippers
- Restriction of blast hole drilling to only day time hours and usage of sharp drilling bits and delivery of compressed air at optimal pressure during drilling
- Controlled blasting techniques with sequential blasting to reduce noise level and blast induced ground vibrations.
- Use of low density explosives to have a heaving effect than an explosion
- Provision of earmuffs/ear plugs to workers in noise prone zones in the mine.

Impact on Water Environment

- Total water requirement is 37m3/day
- There is no waste water generation from the mine, hence contamination of surface and ground water quality is not possible.
- Excavation for limestone mining will be upto a maximum of 32 m and it will encounter with the ground water table as it is at 10 – 14 m.
- Excavated pit will work as water harvesting pit

Water Conservation Measure

To conserve the water following measures are adopted :

- After 3 years of mining the excavated pit will be available for rain water infiltration
- Water sprinkler will be used for dust suppression
- Dry washing of mine machinery will reduce the water consumption

Impact on Land

The present land use of the core-zone i.e. mining lease area is mostly broken waste land. There is no agriculture or forest cover. Afforestation has been done near the mine office outside pit limit. Hence every impact on land use will be positive in future by way of afforestation or water reservoir. Backfilling has already been started towards north-east in old excavated and exhausted portion of the quarry.

In buffer zone no adverse impact is envisaged due to all mining activities being restricted to the core zone only. The intensity of mining is less, most of the area already broken, backfilling proposed & garland drain & bund prepared towards the sloping southern side denies any adverse impact in the buffer zone if any.

Impact on Flora & Fauna

The area is thinly vegetated and with no thick vegetation on the plateau top. There is no tree growth on the top of the plateau area, but grass shrub and bushes grow sparsely. No wildlife are found in this area. The mining activity of the proposed project does not change the community structure of the vegetation.

Impact on Socio-Economy

Since there is no village or human settlement within the core zone, therefore there would be no displacement of the human population.

The expansion in mining operations will substantially increase gross economic production and infrastructure facilities. Therefore, Socioeconomic prospects are likely to improve to some extent. Also increase in mining operations will result in some increase in direct and indirect employment and consequently the population in near by villages.

ENVIRONMENTAL MANAGEMENT PLAN

Air Quality Management

- Drilling & blasting operations which generate maximum quantity of dust are intermittently operated and are restricted to only hard rock portions exposed.
- Water tankers with spraying arrangement will be used for regular water sprinkling on the haul roads to ensure effective dust suppression.
- Dust masks will be provided to the workers especially for the drillers and for the workers working in the loading operations.

Waste Management

Total anticipated generation of waste will be around 0.8 million m^3. There is no generation of sub-grade ore.

The Overburden will be removed in two sages. The soil at the top will be removed first and transported by 10 T tippers for Stacking and later this soil stack shall be reused for spreading over the back filled portions with the overburden and mine wastes.
No external dumping will be done in future. Simultaneously backfilling will be done in the excavated area which will be treated as internal dump only.

The old dump is located towards southern non-mineralized portion of the lease area. The sides have been sloped to 28^0 and inactive sides have been vegetated. The average height of the dump is 18m, suitably terraced of 6m height.

Afforestation

The mined out areas will be backfilled and reclaimed with dense poly-culture plantation of the local species. Water reservoirs will be created in the abandoned mine pit that shall increase the water availability on the plateau for longer periods of time. During the plan period an area of 1.15 ha land has been proposed for phased green belt plantation/afforestation and till the post mining stage a total area of 10.77 ha land shall be afforestated. The species to be grown in the areas should be dust tolerant, fast growing and fruit yielding species so that a permanent green belt is created.

Socio-Economic Benefits

The lessee provides social welfare activities in and around the lease area. The social welfare activities are planned in the following areas:-

- Medical assistance
- Primary Education
- Agriculture improvement
- Vocational Training and
- Assistance in utilizing government programs

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ENVIRONMENTAL MONITORING PROGRAMME

Routine monitoring of all the environmental parameters viz. air, water, noise and soil as per the formulated program based on CPCB and MOEF guidelines every year in order to detect any changes from the baseline status. Monitoring program will be followed till the mining operations continue. For implementation of Environment Management Plan a small unit called Environment Management Division will be formed under the control of the Mines Manager. The job of this division will be regular environmental monitoring, preparation and submission of environmental report, green belt development, etc.

CONCLUSION

Based on the EIA study it is observed that there will be an increase in the dust pollution, which will be controlled by sprinkling of water and transportation of ore in closed trucks. There will be an insignificant impact on ambient environment and ecology due to the mining activities moreover the mining operation will lead to direct and indirect employment generation in the area. Monitoring program will be followed till the mining operations continue. Around Rs.0.71 crores and Rs 0.52 Crores as capital and recurring budget for environmental protection have been formulated to achieve the environmental quality as desired. Hence, it can be summarized that the development of the mine will have a positive impact on the socio-economic of the area and lead to sustainable development of the region.