EXECUTIVE SUMMARY

OF

ENVIRONMENTAL IMPACT

ASSESSMENT REPORT AND

ENVIRONMENTAL MANAGEMENT PLAN

FOR

PUBLIC HEARING

OF

Proposed Captive Limestone Mine

(Karhi - Chandi Limestone Deposit)

with Production Capacity

of 1.95 Million TPA (ROM)(1.5 Million TPA

Limestone and 0.45 Million TPA Inter- burden),

(Area 242.127 ha)

Near

Villages : Karhi, Chandi & Khapradih,

Tehsil - Simga,

District Balodabazar - Bhatapara (Chhattisgarh)

APPLICANT

SHREE CEMENT LIMITED

M/s. Shree Cement Ltd.

Post Box No-33, Bangur Nagar,
Andheri Deori, Beawar, Dist. Ajmer (Rajasthan)
Contact No. : -01462-228101-6
Email ID : bhargavr@shreecementltd.com

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EXECUTIVE SUMMARY

1.0 PROJECT DESCRIPTION

1.1 INTRODUCTION

M/s. Shree Cement Limited (SCL) is a Public Limited Company and environment friendly business organization incorporated under the Companies Act, 1956 (no. 1 of 1956) on 25th October 1979. The Company is engaged in the business of cement manufacturing, mining of mineral for Cement manufacturing and generation of electrical power for captive use & sell.

Cement manufacturing facilities

Presently, our cement production capacity stands at 34.9 Million TPA. The Company's Cement and Clinker manufacturing facilities are located at Beawar & Ras in Rajasthan and Raipur in Chhattisgarh. It has split grinding units at seven locations viz. Khushkhera, Suratgarh, Jobner in Rajasthan, Roorkee in Uttarakhand, Aurangabad in Bihar, Bulandshahr in Uttar Pradesh and Panipat in Haryana.

Power Generation Facilities

Total Thermal Power Plants Capacity of the Company is 616 MW (including 111 MW WHRS Green Power Capacity which is the largest capacity of Green Power in the entire world cement industry excluding China). The power generated from these plants is primarily utilized for consumption in its own cement plants as well as to sell to the outside parties.

Products

The Company pursues with multi-brand portfolio strategy consisting of three brands viz ;Shree Jang Rodhak Cement, Bangur Cement and Rockstrong Cement. The Company currently has the highest market share in Rajasthan, Delhi and Haryana and possess distinguished top position in states of Punjab, West Uttar Pradesh and Uttarakhand.

1.2 TYPE OF PROJECT

This is a Proposed Captive Limestone Mine (Karhi Chandi Limestone Deposit) with production Capacity of 1.95 Million TPA (ROM) (1.5 Million TPA Limestone and 0.45 Million TPA Inter - burden), (Area 242.127 ha) near Villages: Karhi, Chandi & Khapradih, Tehsil- Simga, District Balodabazar-Bhatapara (Chhattisgarh).

Mining Plan & Progressive Mine Closure Plan has been approved by Indian Bureau of Mines (IBM) vide letter no. vide letter no. Baloda bazar/ Chup/MP-53/2016 –Raipur/238 dated June, 6th .2017.

As per EIA Notification dated 14th September, 2006 and amended as on date; the project falls under S. No.'1' (Mining of Minerals), Project or Activity -1(a)-(3) , Category "A" and therefore requires Environmental Clearance from MoEFCC, New Delhi.

1.3 NEED FOR THE PROJECT

Shree Cement Ltd. has proposed expansion of existing Integrated Cement Plant - Clinker (2 x 2.6 to 3 x 4.5 Million TPA), Cement (2 x 3.0 to 3 x 5.5 Million TPA), Waste Heat Recovery Power Plant (30 to 100 MW) and Captive Thermal Power Plant (25 to 125 MW) near Village Khapradih, Tehsil Simga, District Balodabazar - Bhatapara (Chhattisgarh).

The project has been considered in EAC Meeting (Industry-I) held during 10– 12 July 2017 and the project has been recommended for ToR. ToR Letter for the integrated cement plant has been issued by MoEFCC, New Delhi vide Letter No. J - 11011/235/2008- IA-II (I) dated 06th Nov., 2017.

The limestone requirement of the above mentioned integrated cement plant will be fulfilled by the following mine sites-

1. Expansion of Shree Limestone Mine from 8.6 Million TPA to 11.06 Million TPA Limestone (ROM Basis: 14.48 Million TPA which includes 11.06 Million TPA Limestone Production and 3.42 Million TPA Inter-burden & Over-burden excluding Top Soil) (ML No. 38/2007, ML. Area: 531.126 ha) and crushers (Primary: 2 x 1200 TPH & Secondary: 2 x 450 TPH) at Villages: Bharuwadih & Semaradih, Tehsil- Balodabazar in District Balodabazar-Bhatapara (Chhattisgarh).
2. Proposed Proposed Captive Limestone Mine (Karhi Chandi Limestone Deposit) Area - 242.127 ha with production capacity of 1.95 Million TPA (ROM) (1.5 Million TPA Limestone and 0.45 Million TPA Inter - burden) Near Villages: Karhi, Chandi & Khapradih, Tehsil- Simga, District Balodabazar-Bhatapara (Chhattisgarh).

1.4 BRIEF DESCRIPTION OF THE PROJECT

Table – 1
Brief Description of the Project

S. No.	Particulars	Details
A.	**Nature of project**	Proposed Limestone Mining Project
B.	**Size of project**	
1.	Area	242.127 ha
2.	**Production Capacity**	1.95 Million TPA (ROM) (1.5 million TPA Limestone and 0.45 million TPA Inter-Burden)
C	**Project Location (***Location Map showing general and specific location of Mine site has been given as Figure- 1)*	
1.	Villages	Karhi, Chandi and Khapradih
2.	Tehsil	Simga
3.	District	Balodabazar – Bhatapara
4.	State	Chhattisgarh
5.	Coordinates	Latitude: **21°36'12.2"N to 21°37'40.5"N**
		Longitude: **82°01' 31. 4"E to 82°02' 34.1"E**
6.	SOI Toposheet No.	Core Zone: F44Q2 Buffer Zone: F44Q2 and F44P14
D	**Environmental Setting Details (with approx. aerial distance and direction from the mining lease**	

S. No.	Particulars	Details
	boundary)	
1.	Nearest State / National Highway	SH-10 (~7 Km in NNE direction) NH- 200 (~30 Km in West direction)
2.	Nearest Railway Station	Bhatapara (~15 Km in NW direction)
3.	Nearest Airport	Swami Vivekanand Airport Raipur (~55 km in SW direction)
4.	National Park, Wild Life Sanctuary, Biosphere Reserves, Wildlife corridors, Tiger/Elephant Reserves, etc. within 10 km radius of the project site	None
5.	Reserve / Protected Forest within 10 km radius of Project Site	Dhabadih RF (~ 4.0 Km in the ENE direction)
6.	Water body within 10 km radius study area	➢ Mahanadi Canal (~1.5 km in SE direction) ➢ Banjari Nala (~1.5 km in NW direction) ➢ Ameri Division Canal (~ 3.2 km in WSW direction) ➢ Chitawar Nala (~4.0 km in SE direction) ➢ Kukurdih Talav (~6.0 km in NE direction) ➢ Khorsi Nala (~8 km in SE direction) ➢ Jhorki Nala (~8.0 km in SSE direction from mine) ➢ Jamuniya nadi (~8 km in NNW direction) ➢ Tengna nala (~9.5 km in ESE direction)
7.	Seismic Zone	Zone – II as per IS: 1893 (Part-I) : 2002
E	**Cost Details**	
1.	Project Cost	Rs. 34.10 Crores /-
2.	Cost of EMP	Capital Cost: Rs. 3.95 Crores /- Recurring Cost: Rs. 0.22 Crores /-

Source: *Site Visit & Pre-feasibilty Report*

1.5 Location Map

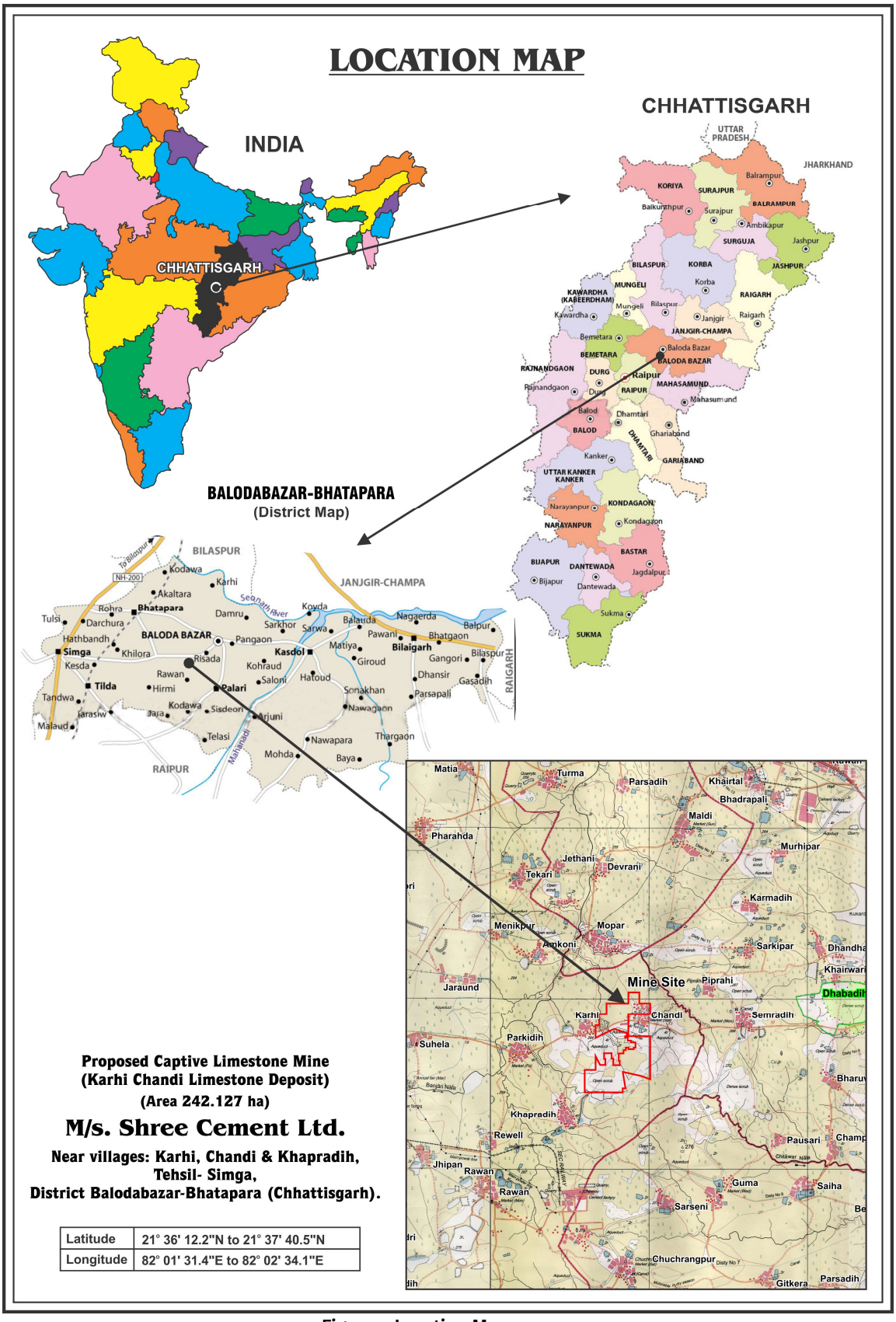

Figure 1- Location Map

1.6 MINE DESCRIPTION

1.6.1 Mining Lease Status

- Government of Chhattisgarh, Department of Mineral Resources, issued the notice inviting the tender dated 08.12.2015 to commence the auction process for grant of mining lease for Captive Limestone Mine located at Villages: Karhi, Chandi and Khapradih, Tehsil: Simga, District: Balodabazar-Bhatapara.
- The auction process was conducted in ordinance of Mineral (Auction) Rule 2015.
- M/s. Shree Cement Limited was declared as the preferred Bidder under Rule 9(4)(b)(iii) of the Rules.
- Accordingly, Letter of Intent (LOI) has been issued in Favour of M/s. Shree Cement Limited over an area of 242.127 ha vide letter no. F 3-03/16/12 dated March 28th, 2016 and amended vide letter no. F3-03/16/12 dated September 16th, 2016.

1.6.2 Mining Details

Table – 2
Mining Details

S. No.	Particulars	Details
1	Method of mining	Open Cast Mechanized Mining
2	Total Geological Reserves	155.0 Million Tonne
3	Mineable reserves	68.2 Million Tonne
4	Life of the Mine	49 Years
5	Bench Height and Width	Bench Height – 12 meter Bench Width –30 meter
6	Elevation Range	258 to 277 m AMSL
7	General Ground Level	267 m AMSL
8	Water table	Pre Monsoon: 263 to 259 m AMSL (4 to 8 mbgl) Post Monsoon: 260 to 251 m AMSL (7 to 16 mbgl)
9	Ultimate Working Depth	230 m AMSL (37 mbgl)
10	Stripping Ratio (Ore: Inter Burden) (mio t : mio t)	1:0.30
11	Overall Pit Slope	45°
12	Number of working days	320 days
13	Number of shifts per day	3 shifts

Source: *Approved Mining Plan & Progressive Mine Closure Plan*

1.6.3 Method of Mining

- Mining operations will be carried out by mechanized opencast method conventional mining method i.e. by combination of shovel and dumper with Drilling and blasting.
- Bench height and bench width will be maintained at 10 m and 30 m respectively.

- Drilling will be carried out by crawler mounted DTH hammer Drill machine.
- Conventional blasting will be done using ANFO and high explosives with use of stock tube detonator.
- Loading will be done by Hydraulic Excavators and transport of limestone and interburden will be done by dumper to crusher (located in mining lease area).
- The crushed limestone will be transported from the mine site to cement plant by covered Conveyor belt.

1.6.4 Extent of Mechanization

Table – 3

Machinery & Equipments

S. No.	Machinery	Total no.
1.	Drill Machines	1
2.	Hydraulic Excavator	1
3.	Dumper	3
4.	Dozer	1
5.	Motor Grader	1
6.	Loader	1
7.	Jeep	1
8.	Maitenance Van	1
9.	Diesel Tank	1
10.	Dewatering Pupm	1
11.	Crusher	1

Source: *Approved Mining Plan & Progressive Mine Closure Plan*

2 DESCRIPTION OF THE ENVIRONMENT

2.1. Presentation of Results (Air, Noise, Water & Soil)

Baseline study of the study area was conducted during Post Monsoon Season, October - December, 2017.

The concentrations of PM_{10} and $PM_{2.5}$ for all the 15 AAQM stations were found between 59.7 to 84.2 µg/m^3 and 24.3 to 43.2 µg/m^3 respectively. The concentrations of SO_2 and NO_2 were found to be in range of 5.9 to 13.5 µg/m^3 and 12.5 to 28.5 µg/m^3, respectively.

Ambient noise levels were measured at 15 locations around the Mine site. Noise levels varies from 49.5 to 65.5 Leq dB (A) during day time and from 38.2 to 58.5 Leq dB(A) during night time.

The Surface water analysis for all the 5 sampling stations shows that pH varies from 7.86 to 8.15, total hardness varies from 68.30 mg/l to 212.84 mg/l & total dissolved solids varies from 96 mg/l to 299 mg/l.

The ground water analysis for all the 10 sampling stations shows that pH varies from 7.36 to 8.02, total hardness varies from 216.46 mg/l to 552.29 mg/l & total dissolved solids varies from 234.0 mg/l to 801.0 mg/l.

Samples collected from identified locations indicate pH value ranging from 7.7.60 to 8.05. Organic Matter ranges from 0.87% to 1.13% in the soil samples. Nitrogen is found to be in moderate amount as it ranges from 215.45 kg/ha to 306.54 kg/ha and Phosphorous in less amount i.e. from 30.22 kg/ha to 55.60 kg/ha, whereas the Potassium is found to be ranging from 215.90 kg/ha to 492.07 kg/ha.

2.2. Biological Environment

Flora: Species which are most commonly found in the study area are *Azadirachta indica* (Neem), *Pongamia pinnata* (Karanj), *Acacia nilotica* (Babool), *Phyllanthus emblica* (Amla), *Zizphus nummularia* (Ber), *Syzygium cumini* (Jamun), *Artocarpus heterophyllus* (Jackfruit) and *Psidium guajava* (Amrud) etc.

Fauna: Commonly found fauna in the study area are *Funambulus pennanti* (Palm squirrel), *Hyaena hyaena* (Stripped hyaena), *Vulpus bengalensis* (Indian fox), *Herpestes edwardsii* (Mongoose), *Saara hardwickii* (Spiny tailed lizard), *Felis chaus* (Jungle cat) and *Pteropus giganteus* (Indian Flying fox) etc.

2.3. Socio-Economic Environment

The population as per 2011 Census records is 109651 (for 10 km radius study area). Scheduled Caste population of the study area (10 km) is 26275 (24 %) and Scheduled Tribe is 12907 (12 %). Total no. of household in the area is 21928 and percentage of literacy is 72.90 %.

3.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

- **Impact on Air Environment -** The key air emissions from the mining activities (drilling, blasting, loading, haulage and transportation) are Particulate Matter, Oxides of Nitrogen (NO_2) and Sulphur dioxide (SO_2). Gaseous emissions will be generated from HEMM, crusher & transportation of vehicles. Use of proper mitigation measures will be taken like water sprinkling during transport activities & development of green area along the road sides to control fugitive emissions. Better maintenance of equipments also help to reduce such emissions.

- **Impact on Water Environment** - There is no major surface water body within the mining lease area. Some water bodies i.e. Mahanadi Canal, Banjari nalla, Ameri Division canal, Chitwar Nalla, Kukurdih Talav, Khorsi nall , Jamuniya nadi , Tengana nala and Jhorki nalla are found in the 10 Km radius study area. The area is drained by The Banjari Nala, which occurs outside the Limestone block, is a perennial stream.

The proposed working will not affect any of the streamlets. There has been no water flow in these streamlets excepting during rains. No waste water will be generated during mining operations. Wastewater generated from office toilets will be discharged in soak pit via septic tank. Waste water generated from workshop will be treated with Oil/ grease/ Water separator. Therefore there is no significant impact on the water environment due to the mining operations in limestone Mining Lease area.

General Ground level is 267 m AMSL. Water table level in Pre monsoon season is 263 to 259 m AMSL (4 to 8 mbgl) and in Post Monsoon season is 260 to 251 m AMSL (7 to 16 mbgl). Ultimate working depth of the mining operation will be 230 m AMSL (37 m bgl). Therefore as per the mining details, Mining operations will encounter water table. Prior permission for Ground water table intersection will be taken from the Concerned Authority.

Moreover, the mineral limestone and associated rocks do not contain any toxic substance. Therefore, there is no significant impact of mining activities on any source of water.

- **Impact of Noise & Vibration** - Major noise generating sources of the mining activity are drilling, blasting, crushing and HEMM movement used for transportation of limestone. The plantation and the green belt around the mining lease boundary help in reducing noise level and proper mitigation measures will be carried out. Controlled blasting techniques through proper blast design and explosive selection reduce the vibrations to a greater extent.

- **Impact on Land Environment** – Opencast mining activities may alter the landscape of the lease area but will not have any significant effect on the surface features of the surrounding areas.

  At the conceptual stage, total excavated area will be 141 ha, out of which 52 ha area will be reclaimed and backfilled followed by plantation and remaining 89 ha area will be converted into water reservoir. Total 80 ha area will be covered under Green belt and plantation.

4.0 POST PROJECT ENVIRONMENTAL MONITORING PROGRAMME

Table 4
Post Project Monitoring

S. No.	DESCRIPTION	FREQUENCY OF MONITORING
1.	Ambient Air Quality	Twice a Week
2.	Water Quality & Level	Quarterly
3.	Noise Level Monitoring	Quarterly
4.	Vibration Monitoring	On every blast
5.	Stack Monitoring	Regular

5.0 ADDITIONAL STUDIES

Additional Studies i.e. Hydro –Geological Study and Risk Assessment & Disaster Management Plan are covered in Draft EIA/EMP Report as per the Terms of References issued vide letter no J-11015/64/2017-IA.II (M) dated 05.09.2017 and amended vide letter dated 27.12.2017.

6.0 PROJECT BENEFITS

The proposed project activity will help in meeting the growing demand of cement & hence help in the economic growth of the country. It will be helpful in the development of basic needs of the local area like education, Health & family welfare, women empowerment, Natural resource management, water conservation, roads etc. It will result in growth of the surrounding areas by increasing direct and indirect employment opportunities in the region including ancillary development and supporting infrastructure.

7.0 ENVIRONMENT MANAGEMENT PLAN

7.1 Air Quality Management

- Drilling machines will be equipped with wet drilling arrangements.
- Sharp drill bits will be used.
- Controlled blasting method with Shock Tube detonator (Downline detonator in combination with Noiseless Trunk line Detonator) will be adopted.
- Rock breaker is proposed to be used in place of secondary blasting for breaking over size boulders.
- Regular Water sprinkling will be done on haulage roads & loading area to arrest dust from being air borne.
- Covered crusher with water sprinkling arrangement at the unloading and inside the crusher.
- Proper maintenance , oiling and greasing of HEMMs will be done to minimize gaseous pollutants.
- Periodic air quality monitoring will be carried out.
- Personal Protective Equipments like dust mask will be provided to all employees.
- Development of green belt/plantation around lease boundary, roads and other places will be carried out to control the air pollution.

7.2 Water Quality Management

- No waste water will be generated from the mining activities.
- Septic tanks and soak pit will be provided for the disposal of domestic waste water generated from mine office.
- Waste water generated from washing of HEMM will be used in crusher for dust suppression after oil and grease separation.
- Garland drains along with Retaining walls having water holes at the toe of temporary dumps will be constructed to avoid the soil wash out & around the mine pit to prevent surface run off entering into the mine pit.
- Periodical Ground water level & quality monitoring will be carried out.

7.3 Noise Quality Management

- Drilling will be carried out with the help of sharp drill bits which will help in reducing noise.
- Secondary blasting will be totally avoided and Hydraulic rock breaker will be used for breaking boulders.
- Controlled blasting method with Shock Tube detonator (Downline detonator in combination with Noiseless Trunk line Detonator) will be adopted.
- HEMMs equipped with acoustic cabins will be provided for the operators.
- Proper maintenance, oiling and greasing of HEMMs will be done to minimize generation of noise.
- Periodical monitoring of noise will be done.
- Green Belt and Plantation will be developed around the mining activity area and along haul roads. The plantation checks propagation of noise.

7.4 Top Soil and Solid Waste Management

- Total 85000 cubic meter (0.136 million tonne) Top soil will be generated at end of the 5th year of mining plan.
- Total 275855 cubic meter interburden (0.690 million tonne) will be generated at end of the 5th year of mining plan.
- During mining operations, the top soil is proposed to be stacked separately in temporary top soil dump yard which will be later spread in 7.5 m safety zone along the lease boundary.
- At the end of life of mine, total 22.5 million tones will be generated.
- At the end of life of mine, 18.9 Million tonne of waste will be backfilled in the excavated area and plantation will be done over it after spreading top soil over it and remaining 3.6 Million tonne of waste will be dumped which will be stabilized by plantation later.

7.5 Land use pattern

- At the conceptual stage, total excavated area will be 141 ha, out of which 52 ha area will be backfilled followed by plantation and remaining 89 ha area will be converted into water reservoir.
- Total 80 ha area will be covered under Green belt and plantation.

7.6 Greenbelt Development and Plantation Program

- At the end of life of mine Green belt/Plantation will be done on 80 ha (17 ha on waste dump, 4 ha on 7.5 meter barrier zone and 7 ha on undisturbed area and 52 ha on backfilled area)
- Density of plantation would be 1500 trees / ha.
- Survival will be maintained more than 90%.

- Species proposed for plantation on backfilled area are – Sesbania grandiflora (Humming bird tree/Agati), Grevillea robusta (Silver Oak- Usage in mining benches), Peltophorum pterocarpum (Yellow Gulmohar), Tectona grandis (Teak/ Sagwan), Bombax ceiba (Semal), Morus alba (Shahtut), Phyllanthu semblica (Amla Plantation), Annona Squamosa (Sitaphal Plantation), Psidiumguajava (Guava Plantation), Manilkarazapota (Chiku Plantation), Acacia senegal (Gum arabic tree), Moringa oleifera (Senjana), Acacia nilotica (Babool), Acacia catechu (Khair), Cassia fistula (Amaltas), Delonix regia (Gulmohar), Capparis decidua (Kair), Ziziphus mauritiana (Mota Ber), Cynodondactylon (Doob grass).

- Species proposed for plantation on the un worked area are - Azadirachta indica (Neem), Sesbania grandiflora (Humming bird tree/Agati), Grevillea robusta (Silver Oak- Usage in mining benches), Peltophorum pterocarpum (Yellow Gulmohar), Tectona grandis (Teak/ Sagwan), Artocarpus heterophyllus (Jackfruit), Morus alba (Shahtut), Phyllanthus emblica (Amla Plantation), Annona Squamosa (Sitaphal Plantation), Psidium guajava (Guava Plantation), Manilkarazapota (Chiku Plantation), Acacia senegal (Gum arabic tree), Moringa oleifera (Senjana), Tecomastans(Yellow bells), Cassia fistula (Amaltas), Delonix regia (Gulmohar), Nerium indicum (Kaner).

- Species proposed for plantation on the waste dump area are – Sesbania grandiflora (Humming bird tree/Agati), Grevillea robusta (Silver Oak- Usage in mining benches), Peltophorum pterocarpum (Yellow Gulmohar), Tectona grandis (Teak/ Sagwan), Artocarpus heterophyllus (Jackfruit), Bombax ceiba (Semal), Morus alba (Shahtut), Phyllanthus emblica (Amla Plantation), Annona Squamosa (Sitaphal Plantation), Psidiumguajava (Guava Plantation), Manilkarazapota (Chiku Plantation), Acacia senegal (Gum arabic tree), Moringa oleifera (Senjana), Acacia nilotica (Babool), Acacia catechu (Khair), Cassia fistula (Amaltas), Delonix regia (Gulmohar), Capparis decidua (Kair), Ziziphus mauritiana (MotaBer), Cynodon dactylon (Doob grass).

- This will be done in consultation with local forest department.

7.7 Socio-Economic Environment

Better education facilities, proper health care, road infrastructure and drinking water facilities are basic social amenities for better living standard of any human being. SCL will provide such facilities to the nearby villagers and will further improve the facilities in the area, which will help in uplifting the living standards of local communities.