EXECUTIVE SUMMARY

OF

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

FOR

PUBLIC HEARING

OF

Proposed Enhancement of Limestone

Production Capacity from 3.17 MTPA to 5.50 MTPA (ROM)

M.L. Area- 395.05 ha

At

Villages : Kukurdih & Risda, Tehsil : Balodabazar,
District : Balodabazar-Bhatapara (Chhattisgarh)

APPLICANT

M/s. Emami Cement Limited

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1.0 PROJECT DESCRIPTION

1.1 Introduction

- Emami group is a well diversified, professionally managed group of company in Eastern India, having interest in FMCG, news print, Writing Instruments, Health care and Hospitals, Retail pharmacies, Departmental stores, Bio diesel, Edible Oil, Real Estate, Cement and Solar Power.
- Emami Cement Limited has entered into MoU with Government of Chhattisgarh for setting up of integrated cement plant along with limestone mine and Captive Thermal power Plant in Risda and Dhandhani villages of Tehsil- Balodabazar, District- Balodabazar- Bhatapara (Chhattisgarh).

1.2 Type of Project

M/s. Emami Cement Ltd. (ECL) (An Emami Group Company) has proposed for enhancement of Limestone Production Capacity from 3.17 MTPA to 5.50 MTPA (ROM); M.L Area- 395.05 ha at Villages- Kukurdih & Risda, Tehsil- Balodabazar, District- Balodabazar- Bhatapara (Chhattisgarh).

As per EIA Notification dated 14th September 2006, as amended from time to time; this project falls under Category "A", Project or Activity 1(a) – (3) and therefore requires Environmental Clearance from MoEF & CC, New Delhi.

The project was considered by EAC (Non- Coal Mining) for ToR approval on 15.05.2015. Terms of Reference (ToR) have been issued by MoEF & CC, New Delhi for preparation of EIA/EMP report vide letter no.- J-11015/135/2015- IA. II (M) dated 9th June, 2015.

1.3 Need for the Project

Cement is an essential ingredient for the modern building construction. The new generation cement plant in India now employs the latest technology for better efficiency, energy conservation and economics of large capacity production. The improved market conditions witnessed recently, after a grip of recession over a long period, are expected to continue due to high priority being given by the Government to housing and infrastructure and also in view of the massive investment proposed in industry and rural sectors. Therefore, there is an urgent need to increase the cement production capacity in the country in spite of severe resource constraints. For that, limestone is the basic raw material.

EC was obtained for the Cement Plant (2.5 MTPA), Captive Power Plant 40 MW, at Risda and Dhandhani villages along with Limestone mine of capacity 3.17 MTPA at Villages- Kukurdih & Risda, Tehsil- Balodabazar, District- Balodabazar- Bhatapara (Chhattisgarh) from MoEF & CC, New Delhi vide letter no. J-11011/372/2007-IA II (I) dated 31st October, 2011.

ECL has Proposed Expansion of Clinkerization Capacity of Integrated Cement Plant from 1.98 MTPA to 3.2 MTPA.

The proposed enhancement in limestone production capacity from 3.17 MTPA to 5.50 MTPA (ROM) will meet the requirement/demand of limestone for the proposed expansion of Clinkerization Capacity of Integrated Cement Plant.

1.4 Brief Description of the Project

Table – 1
Brief Description of the Project

S. No.	Particulars	Details
A.	**Nature of project**	Limestone Mining Project
B.	**Size of project**	
(i)	Mining Lease area	395.05 ha {Govt. Land – 35.401 ha, Private Land – 359.649 ha)
(ii)	Proposed Expansion of Limestone Production Capacity	From 3.17 MTPA to 5.50 MTPA (ROM)
C.	**Project Location**	
(i)	Villages	Kukurdih & Risda
(ii)	Tehsil	Balodabazar
(iii)	District	Balodabazar- Bhatapara
(iv)	State	Chhattisgarh
(v)	Latitude	21^{o} 38' 0.072" N to 21^{o} 39' 48.105" N
(vi)	Longitude	82^{o} 06' 12.855" E to 82^{o} 07' 30.230" E
(vii)	Toposheet No.	64 K/ 2
D.	**Environmental Setting Details (with approx. aerial distance & direction from the mining lease boundary)**	
(i)	Nearest Town	Balodabazar (~4 km in East direction)
(ii)	Nearest State Highway	SH - 10 (~1 km in North direction)
(iii)	Nearest Railway Station	Bhatapara (~19 km in NW direction)
(iv)	Nearest Airport	Raipur (~62 km SSW direction)
(v)	National Parks, Wild Life Sanctuaries, Biosphere Reserves etc., within 10 km radius study area	No National Park, Wild Life Sanctuary, Biosphere Reserve etc., Protected Forest falls within 10 km radius study area.
(vi)	Reserved/ Protected Forests within 10 km radius of study area	➢ Sonbarsa & Latwa R.F (~ 4.5 km in NE) ➢ Mohtara R.F. (~7.5 km in NE) ➢ Dhabadih R. F. (~ 0.5 km in SSW)
(vii)	Water Bodies within 10 km radius of study area	➢ Kukurdih Talav (Adjacent in West) ➢ Jamuniya River (~ 9.4 km in NNW) ➢ Mahanadi Canal (~ 2.5 km in NW)

		➢ Banjari Nala (~ 8.6 km in W) ➢ Khorsi Nala (~ 3.6 km in South)
(viii)	Seismic Zone	Zone – II [as per IS 1893 (Part-I): 2002]
E.	**Cost Details**	
(i)	Total Project Cost	₹ 45 Crore/-
(ii)	Cost for Environmental Protection Measures	Capital cost – ₹ 3 Crore/- Recurring cost – ₹ 3 Lakhs/annum
F.	**Requirements for the project**	
(i)	Land requirement	395.05 ha
(ii)	Water requirement	240 KLD Source: Ground water & Mine sump.
(iii)	Manpower requirement	89 persons

Source: *Site Visit & Pre-Feasibility Study Report*

1.5 Location Map

Location map of mine is given in Fig. 1.1 on next page.

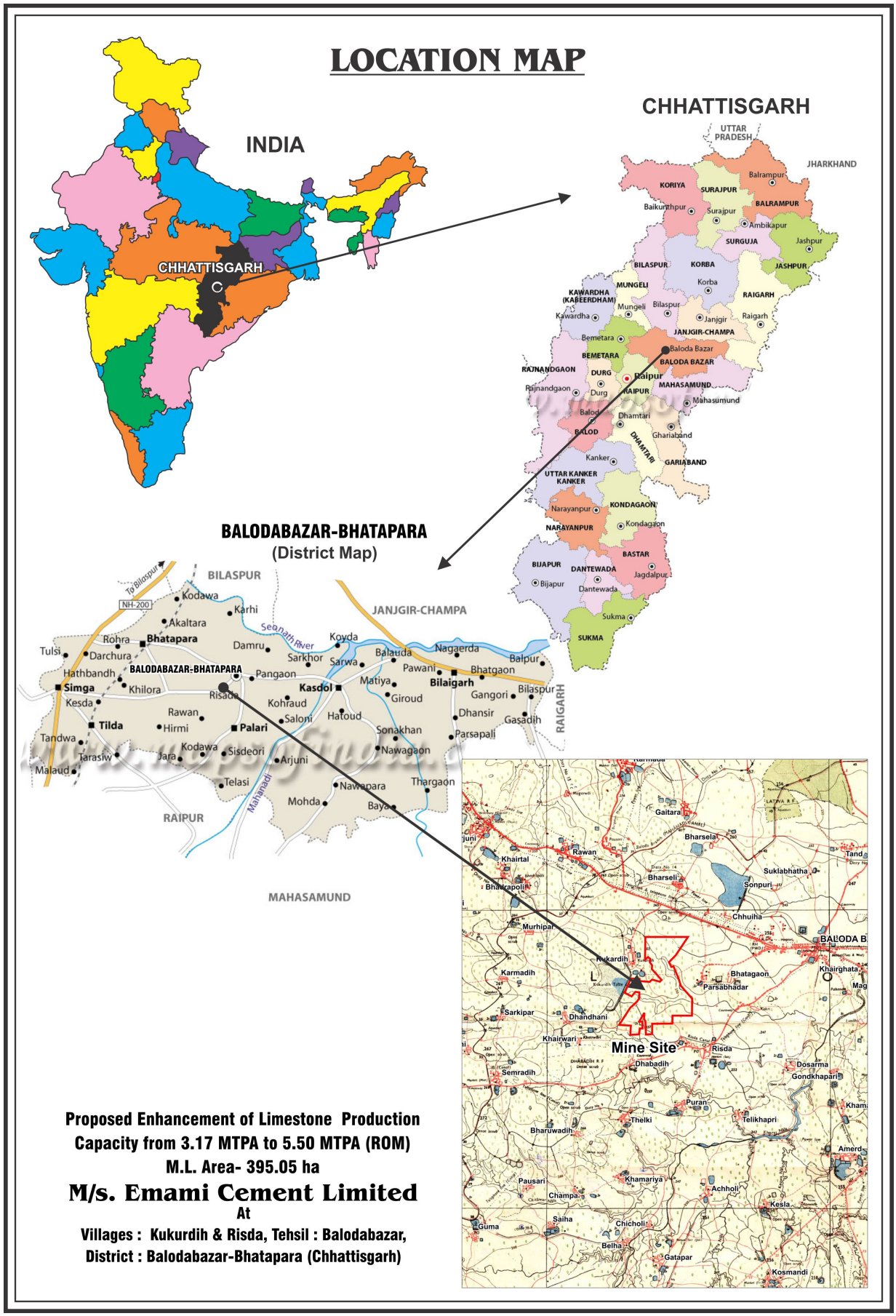

Fig. 1.1 Location Map showing Mine Site

1.6 MINE DESCRIPTION

1.6.1 Mining Lease Status

Mining lease over an area of 395.05 ha was granted in favor of M/s. Emami Cement Ltd. by Department of Mineral Resources, Govt. of Chhattisgarh on 08.09.2009.

1.6.2 Mining Details

Table – 2
Mining Details

S. No.	Particulars	Details
1.	Method of Mining	Fully Mechanized Opencast
2.	Proposed Limestone Production Capacity for Expansion	5.50 MTPA (ROM)
3.	Total Mineable Reserves	155.28 Million Tonnes
4.	Life of Mine	~31.06 years @5.0 MTPA production rate
5.	Bench Height	10 m
6.	Bench Width	25 m
7.	Elevation Range	247 – 258 m RL
8.	General Ground Level	253 m RL
9.	Ground Water Table	➢ Pre Monsoon = 247 to 236 mRL or 6 m to 17 m bgl ➢ Post Monsoon = 249 to 244 mRL or 4 m to 9 m bgl
10.	Ultimate Working Depth	North Block : 70 m (183 mRL) South Block: 50 m (203 m RL)
11.	Overall Pit Slope	45^{O}
12.	Stripping ratio (Million Tonnes: Million Tonnes)	1: 0.21 (ROM: Waste)
13.	Number of Working Days per year	300
14.	Number of shifts per day	2

Source: *Approved Modified Mining Plan with Progressive Mine Closure Plan*

1.6.3 Method of Mining

Mining will be by mechanized opencast method adopting a system of benches. Bench height will be maintained at 10m. Hydraulic excavators will be deployed for progressing benches and for handling ore/waste material. Drilling and blasting techniques will be used for hard formations. Dumpers will be used for loading and dumping of waste material/ore. Limestone will be blasted, handled and loaded by excavators into dumpers of 60 ton capacity and ROM will be crushed to -40mm in crushing/screening plant and transported to the cement plant by covered conveyor belt.

1.6.4 Extent of Mechanization

Table - 3
Machinery & Equipments

S. No.	List of Machines	No.	Size/ Capacity	Make	Motive Power
1.	Drill machine	02	150 mm	Sandvik	Diesel
2.	Excavator	03	6.5 cu.m	PC 1250- Komatsu	Diesel
3.	Excavator cum Rock breaker	02	2.0 cu.m	PC 300- Komatsu	Diesel
4.	Wheel loader	01	5.0 cu.m	Caterpillar	Diesel
5.	Dumpers	12	60 tonnes	HD465- Komatsu	Diesel
6.	Dozer	02	-	D155A- Komatsu	Diesel
7.	Explosive Van	01	10 tonnes	Ashok Leyland	Diesel
8.	Jeep	02	-	Mahindra	Diesel
9.	Water Tanker	02	8000 ltrs	Tata	Diesel
10.	Crushing Plant	01	1500 tph	L & T	D.G. Power
11.	Diesel Bouser	01	8000 ltrs	Tata	Diesel
12.	Hydra	01	-	-	Diesel
13.	Tire handler	01	3 TE	Godrej	Diesel
14.	Mobile Service Van	01	-	-	Diesel

Source: *Approved Modified Mining Plan with Progressive Mine Closure Plan*

2.0 DESCRIPTION OF THE ENVIRONMENT

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

Baseline study for the project was conducted during Post- Monsoon season- October to December, 2015.

The concentration for all the 8 AAQM stations for PM_{10} ranged between 58.3 to 82.5 µg/m_3, $PM_{2.5}$ ranged between 25.1 to 39.4 µg/m_3, SO_2 ranges between 5.2 to 10.5 µg/m^3 and NO_2 ranged between 13.2 µg/m^3 to 22.7 µg/m^3.

Ambient noise levels were measured at 8 locations in and around the Mine site. Noise levels varied from 50.1 to 58.2 Leq dB(A) during day time and during night time noise levels ranged from 41.2 to 48.3 Leq dB(A).

surface water analysis for 3 sampling stations shows that pH varied from 7.73 to 7.90, Total hardness varied from 85.8 mg/l to 220.48 mg/l and Total Dissolved Solids varied from 145 mg/l to 324 mg/l.

The ground water analysis for all the 7 sampling stations shows that pH varied from 7.18 to 7.83, Total Hardness varied from 94.24 mg/l to 416.24 mg/l & Total Dissolved Solids varied from 278 mg/l to 945 mg/l.

The analysis results for soil shows that soil is slightly alkaline in nature as pH value ranged from 7.10 to 7.98 & is silty loam in texture. The concentration of Nitrogen has been found to be in better amount in the soil samples.

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 158058 (for 10 km radius study area). SC population distribution is 4940, 11788 and 15383 respectively in primary, secondary and outer zone. ST population distribution is 2190, 6231 and 13233 respectively in primary, secondary and outer zone respectively. Literacy rate is 70.96%, 72.93% and 68.47% in primary, secondary and outer zone respectively. The percentage of total working population and non-working population is 43.69% and 56.30% respectively of whole population of surveyed villages.

This indicates that the economic conditions in this area are not good. They require jobs to upgrade their livelihood status and fulfill basic needs. Total no. of households are 2775, 11278 and 17378 respectively in primary, secondary and outer zone.

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 are being/ will be taken like water sprinkling during transport activities & development of green area along the road sides to control fugitive emissions.
- **Impact on Water Environment**– No waste water will be generated from mine. Therefore, no significant impact on surface water bodies is anticipated due to mining operations. Domestic waste water generated from office will be treated in septic tank via soak pit.

  The general ground level in the mine area is 253 m RL. Ultimate working depth will be 70 m (183 mRL) in North Block and 50 meter (203 mRL) in South Block. Water level in the proposed area is 247 to 236 mRL or 6 m to 17 m bgl during Pre- monsoon season and 249 to 244 mRL or 4 m to 9 m bgl during Post Monsoon season.

  Working has been planned upto 25 m depth in this plan period. However, detailed hydro geological investigation will be carried out during next plan period & its observations would

be submitted to concern authorities like CGWA, IBM, CECB etc. & necessary permissions would be obtained prior to mining below ground water table.

- **Impact of Noise-** Major noise generating sources of the mining activity will be drilling, blasting, crushing and trucks movement used for transportation of limestone. The instant noise level from blasting will be high but for a very short duration. Plantation will check propagation of noise in the surrounding area.
- **Impact on Land Environment** – Opencast mining activities may alter the landscape of the lease area but will not have any effect on the surface features of the surrounding areas.

  At the conceptual stage, out of the total mining lease area (i.e. 395.05 ha), 283.46 ha area will be excavated.

  At the conceptual stage, about 392.74 ha area will be covered under greenbelt/ plantation.

4.0 POST PROJECT ENVIRONMENTAL MONITORING PROGRAMME

Table- 4

S. No.	DESCRIPTION	FREQUENCY OF MONITORING
1.	Meteorological Data	Daily
2.	Ambient Air Quality at mine site	Quarterly/ Half Yearly
3.	Water Quality	Quarterly/ Half Yearly
4.	Noise Level Monitoring	Quarterly/ Half Yearly
5.	Soil Quality	Half Yearly/Yearly
6.	Monitoring of Agricultural crops	Yearly
7.	Socio – economic status of nearby area	Yearly
8.	Stack Monitoring	Quarterly/ Half Yearly

5.0 ADDITIONAL STUDIES

The Additional Studies viz. Hydrogeology study, Biological study, R & R & Need Based Assessment study as per the Terms of References issued vide MoEF&CC letter no.- J-11015/135/2015- IA. II (M) dated 9th June, 2015 are covered in Draft EIA/ EMP Report.

6.0 PROJECT BENEFITS

The project activity will help in meeting the growing demand of cement & hence will help in the economic growth of the country. Emami Cement Limited (ECL) is committed to contribute to upliftment of the social status of the people of the area through performing various CSR activities. Women Empowerment, Plantation work, Health Programmes, Educational Training, Blanket & Sweater distribution & Bore well for drinking water in the area are some of the highlights of the CSR activities which are being/ will be taken up by the company.

7.0 ENVIRONMENT MANAGEMENT PLAN

7.1 Air Quality Management

- ✓ Sharp drill bits will be used for drilling to reduce generation of dust.

- ✓ Use of Non Electric Ignition System, use of millisecond delay detonators and optimizing the blasting parameters to control & prevent the dust to get air borne and to control the fly rock.
- ✓ Rock breaker will be used for breaking over size boulders.
- ✓ All the haul roads will be kept properly graded with sufficient width and regular water spraying is done on the haul roads.
- ✓ Proper maintenance of vehicles will be carried out regularly for minimization of generation of gaseous pollutants.
- ✓ Personal Protective Equipment like dust mask, ear plug/ear muff, goggles, safety shoe, hand gloves will be provided to all employees.
- ✓ Periodical ambient air quality monitoring will be done.
- ✓ Development of green belt/plantation around lease boundary and other places to arrest dust.

7.2 Water Quality Management

- ✓ No waste water will be generated during mining operation.
- ✓ Domestic waste water generated will be disposed off in soak pit via septic tank.
- ✓ Garland drain having siltation pits will be provided at the toe of the dumps along the slopes to divert the rain water course away from the dumping areas.
- ✓ Generated effluent will be used for sprinkling on haul roads, dust suppression purpose at crushing plant, loading, afforestation purposes and domestic use like washing etc.
- ✓ Dump slopes will be covered with grass plantation to stabilize and prevent erosion

7.3 Noise Quality Management

- ✓ Drilling will be carried out with the help of sharp drill bits which help in reducing noise.
- ✓ Secondary blasting will be totally avoided and NONEL will be used in blasting.
- ✓ Controlled blasting with proper spacing, burden & stemming will be maintained.
- ✓ Proper maintenance, oiling & greasing of machines at regular intervals will be done to reduce generation of noise.
- ✓ Greenbelt/plantation will be done along haul roads, mine office & on undisturbed area for minimizing the propagation of noise.
- ✓ Periodic monitoring of noise will be carried out in the core zone as well as in the buffer zone.

7.4 Solid Waste Management

- ✓ At the end of plan period, total 183330 Tonnes of top soil and 549998 Tonnes of waste will be generated. At the end of life of mine, 32.09 Million Tonnes of waste will be generated.
- ✓ The non-mineralized portions within the mining lease area have been selected for dumping of OB and stacking top soil.
- ✓ Topsoil generated will be be used for plantation purpose.
- ✓ Waste will be used for backfilling of the mined out area at later stages.

7.5 Management of Land Use Pattern

The mining activity will affect the present landscape of the M.L. area. The original topography of the ML area will be affected due to the mining operation.

At the conceptual stage of mining, out of the total mining lease area (i.e. 395.05 ha), total mined-out area will be around 283.46 ha. No reclamation & rehabilitation of mined- out land is planned in this plan period as no mining or dumping areas are going to mature.

7.6 Greenbelt Development and Plantation Program

Out of total M.L. area of 395.05 ha, at the conceptual stage, about 392.74 ha area will be covered under greenbelt/ plantation (283.46 ha backfilling, afforestation/ water reservoir, 15.46 top- soil dump plantation, 15.48 waste dump plantation, 74.52 afforestation on un- worked area including buffer zone and 3.82 ha over mineral storage).

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. ECL will initiate the above amenities either by providing or by improving the facilities in the area, which will help in uplifting the living standards of local communities.