

# **SUMMARY ENVIRONMENTAL IMPACT ASSESSMENT REPORT**

## **1.5 MTPA Limestone Mine**

**Mining Lease Area 249.41 ha**

**Near**

**Villages: Newari, Phulwari, Bambariya, Chirahi &  
Garrabhata**

**Tehsil: Simga & Palari, District: Balodabazar  
(Chhattisgarh)**

**by**

**Adhunik Corporation Limited**

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## 1.0 Project Description

Adhunik Corporation Ltd. (ACL), Kolkata is a part of the Adhunik Group which is in the business of manufacture of Steel, Cement, Power and Mining with an excellent market network all over the country. In order to meet the demand of limestone for cement making, ACL is proposing to develop 1.5 Million Tons Per Annum (MTPA) captive limestone mines in villages Newari, Phulwari, Garrabhata, Chirahi and Bambariya, Tehsil Simga and Palari, District Baloda Bazar, Chattisgarh. The mining lease area is 249.41 hectares. 36.356 hectares land is barren and 213.054 hectares land is agriculture land. No forest land or village is present inside the lease area. Land for proposed 1.5 MTPA Cement Plant (Clinker production - 1.0 MTPA) is identified at village Rawan, which is about 3 km from the mine. Limestone production at full capacity will be 1.5 MTPA, which will be crushed in 1200 TPH Crusher and transported to the Cement Plant by conveyor.

Government of Chhattisgarh approved the Mining Lease vide Order No. F-3-27/2008/12 on 11/10/2010 and F-3-27/2008/12 (1) dated 4/2/2013. Indian Bureau of Mines (IBM) has approved the Mining Plan vide letter no. 314(3) 2011-MCCM (CZ)/MP-45 dated 01/05/2012.

The proposed project falls under Category A (1 a) of EIA Notification 14<sup>th</sup> September 2006. Terms of Reference (TOR) for EIA have been approved by MoEF vide Letter No. J-11015/321/2014-IA.II (M) dated 9<sup>th</sup> June 2015. This draft EIA report has been prepared as per the Terms of Reference (TOR) for Public Hearing.

**Location:** The mine site is located near Newari, Phulwari, Garrabhata, Chirahi and Bambariya villages. The elevation is 274m above Mean Sea Level (MSL). Balodabazar is located about 18 km from the proposed mine site. Nearest railway station is Hathbandh, about 26 km away from proposed mine site. The nearest airport is Raipur which is about 70 km from proposed mine site. The Limestone Mines and Cement Plant of Grasim and Ultratech are located within 5 km of the proposed mine site.

There are no ecologically sensitive places within 10 km radius of the mine site. Mahanadi canal (Baloda branch) is passing adjacent to mine boundary, in northwest direction. Mahanadi canal (Lower branch) is passing at a distance of about 8.5 km in south east direction.

**Project Cost:** The estimated cost of the project is Rs.100 crores.

**Employment:** 78 people will get direct employment from the project. About 100 people will get indirect employment in the project. .

**Water Requirement:** 100 kl/day water will be required for the project. The water requirement would be met from rainwater harvesting ponds proposed inside the lease area.

**Power Requirement:** 0.9 MW electricity will be required, which will be taken from State Electricity Board.

**Mining Process:** Mechanized opencast mining method comprising shovel - tipper combination will be adopted. Drills, hydraulic rock breaker, hydraulic excavator and dumper trucks will be deployed. Controlled blasting will be applied. Overburden material will be dumped close to mine boundary inside the mine area. The height of the dump will be 10 m maximum. Limestone will be crushed up to 75 mm in a 1200 TPH Crusher. Crushed limestone will be transported to the proposed cement plant of the company by Conveyor Belt.

## **2.0 Description of Environment**

Baseline data was generated during the period 1<sup>st</sup> October 2015 to 31<sup>st</sup> December 2015. 10 km area around the mines boundary was considered as study area. Data was generated as per the standard procedures of the Ministry of Environment & Forests and the Central Pollution Control Board.

Meteorological data on wind speed, wind direction, relative humidity and temperature was generated at Garrabhata. Baseline ambient air quality was measured at 5 locations in the core and buffer zone. Noise levels were measured at 5 locations. Surface water from 3 locations, groundwater quality from 8 locations and soil quality from 6 locations were collected and analysed in laboratory. Data on plants and animals was collected from the published documents and checked during field survey. Data on landuse, demography, occupation pattern, cropping pattern, infrastructure facilities were collected from District Statistics Handbook and Primary Census 2011.

**Climate and micro-environment:** The predominant wind direction is from southwest and west direction. The average wind speed ranges from 0.5 to 3.2 m/s. Daily mean temperature varied from 14.2<sup>o</sup>C to 31.8<sup>o</sup>C. The relative humidity varied from 20-54%. The annual rainfall is 1288 mm. The study area falls under Seismic Zone II.

**Air Quality:** PM<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>2</sub>, benzene, ozone, ammonia, carbon monoxide as well as Benzo(a)pyrene, Silica, As, Ni and Pb in PM<sub>10</sub> were monitored at 5 locations in the study area. The locations were selected as per CPCB guidelines. Monitoring was done at upwind direction and various downwind directions of the project. The baseline air quality levels of all parameters are found to be within the National Ambient Air Quality Standards prescribed for residential and industrial area. Maximum and minimum values are given in the following table.

Location	PM <sub>10</sub> , µg/m <sup>3</sup>		PM <sub>2.5</sub> , µg/m <sup>3</sup>		SO <sub>2</sub> , µg/m <sup>3</sup>		NO <sub>2</sub> , µg/m <sup>3</sup>	
	Min	Max	Min	Max	Min	Max	Min	Max
Newari village	43	58	18	29	4.0	4.3	9.2	11.2
Chuchangpur vill	40	54	18	24	4.2	6.2	9.2	11.8
Boidih village	48	68	22	28	4.5	7.2	9.6	12.2
Kudwa village	47	60	19	27	4.5	6.5	9.2	11.5
Parkidih vill	44	56	18	24	4.0	5.8	9.0	11.5

**Noise Quality:** Ambient noise levels were monitored at 8 locations in the study area. The baseline noise levels are well within the National Standards for residential area (Standards are 55 dBA-day time and 45 dBA-night time). The results are given in the following table

Location	Category	Daytime Noise Leq;dB(A)	Standard Day Time Leq;dB(A)	Night Noise Leq;dB(A)	Standard Night Time Leq;dB(A)
Newari village	Residential	46.8	55.0	40.6	45.0
Chuchangpur vill	Residential	48.2	55.0	41.4	45.0
Boidih village	Residential	49.4	55.0	41.8	45.0
Kudwa village	Residential	48.6	55.0	41.6	45.0
Parkidih vill	Residential	47.2	55.0	40.8	45.0

**Water Quality:** 3 surface water samples and 8 groundwater samples were collected from the study area for chemical and biological analysis. Surface water samples were collected from upstream and downstream point of ponds, streams/ canals. The surface water quality of river and dam meets the designated use criteria. The surface water is fit for irrigation and industrial use. The surface water quality is fit for drinking only after conventional treatment. Groundwater samples were collected from hand pumps of villages around the project site. The groundwater quality meets the standards prescribed by Bureau of Indian Standards (BIS 10500). pH of ground water was found between

7.64 to 8.02. TDS was found between 478- 980 mg/l. Total hardness was found between 190- 290mg/ l. Magnesium was found between 12.2 – 29.4 mg/ l.

**Soil Quality:** 6 soil samples were collected from the study area and analyzed. The texture of soil is sandy loam. The organic matter, nitrogen, potassium and phosphorus content of the soil are moderate. The pH and conductivity of all the soil samples are within the acceptable range.

**Sensitive Ecosystem:** Within 10 km distance of the project site, no plant or animal species were found to be on the endangered list. No ecologically sensitive area like biosphere reserve, tiger reserve, elephant reserve, migratory corridors of wild elephant, national park, wildlife sanctuary are present within 10 km distance of the project site.

**Socioeconomic Data:** Administratively, the villages and settlement within 10 km area around mine falls in Shimga & Palari tehsil of Baloda Bazar district. 71 villages fall in the buffer zone of the mines boundary (10 km area). Total population of the study area is 348809 comprising 174328 males and 174481 females. Total household is 68910. SC and ST population is 23.06% and 12.42% respectively. Male female ratio of the study area is 999 females / 1000 males.

**Land Acquisition and R&R:** Land will be purchased based on mutual negotiation following all rules and norms of Land Acquisition Act 2013 and R&R Policy of Govt of Chhattisgarh. Land rates fixed by Govt of CG shall be paid to all landowners. There are 422 landowners and most of them are OBC and Scheduled Castes.

### **3.0 Environmental Impact and Mitigation Measures**

**Water Environment:** Rainwater harvested in ponds and pits inside mine area will be used for dust suppression and green belt development. Groundwater will be used only for drinking.

**Mitigation Measures:** The surface runoff generated during rainfall event will be diverted to mined out pits and other ponds / depressions inside the mine premises. This will act as rainwater harvesting structures. Garland drains with sedimentation pits at appropriate intervals will be made around the overburden dump. Runoff from dump slopes will be passed through Baffle Plate filters to arrest the silt before letting it to the pits. Gully along the slopes will be provided with Baffle Plates to arrest the silt. The slope will be compacted routinely and soil will be spread over it and stabilized by planting herbs and

shrubs. This will prevent soil and silt erosion. Domestic wastewater will be treated in septic tanks and disposed in soak pits. All water accumulated inside the mine premises will be checked to avoid breeding of mosquitoes. The spent oil and lubricants from workshop, vehicles, etc will be given to authorized SPCB/ CPCB recyclers/ re-processors. There will be no discharge of wastewater outside the mine premises.

**Air Environment:** Dust is the main pollutant generated during various mining operations, including blasting, transportation on haul roads, loading and vehicular movement.

**Mitigation Measures:** Stable roads will be made inside the mining premises for movement of vehicles. Water sprinkling system (truck mounted) will be applied for dust suppression on haul roads. Regular maintenance of vehicles and equipment will be carried out. Wet drilling and controlled blasting will be adopted. Bag filters and water sprinklers will be installed in the Crusher to minimize dust emission. 7.5 m greenbelt will be developed around the mine boundary. First row will be planted with small shrubs like bougainvillia, kaner, ber, casuraina followed by big trees like Shisham, Siris, Amaltas, Ber, Amaltas, Jamun, Moringa, Peepal, Jamun, Neem, Kadam, Mango, Kadam, Harsingar, etc will be planted.

**Noise Environment:** Material handlings, movement of vehicle, blasting, loading and unloading activities are the main noise generating sources in the mine site.

**Mitigation Measures:** Material handling operations and movement of vehicles will be properly scheduled to minimize noise. Maintenance program for heavy vehicles will be routinely followed. Non-electric delay detonator will be used to minimize the ground vibrations. Workers working inside crusher house will be given ear plugs / ear muffs. Mining will be done only during day time. In this manner the noise level at the mine boundary will be below the national standard of 55 dBA during day time and 45 dBA during night time.

**Land Environment:** Overburden will be stacked at the periphery of mining lease boundary along the south side to form bunds (7.5 m inside the mine boundary). The slope will be maintained at less than 37°, with adequate number and size of steps / trenches made. The slopes will be compacted and spread with 8-10 cm thick soil cover and grass, legumes and small shrubs will be planted along the slopes. Recyclable materials will be sorted out and sold to local recyclers. Inert material will be reused as landfill. Organic and other green waste will be taken to compost pit. Use of plastic inside mine area will be strictly prohibited. Mined out area will be suitably reclaimed after

extracting the limestone. Reclamation will be done by backfilling the overburden. Remaining voids will be converted to water body. For reducing adverse environmental impacts from other sources, following mitigation measures are recommended in the EIA:

- Wet drilling will be practiced. The drilling machine will have inbuilt water sprinkling arrangement and dust extraction system.
- Controlled blasting technique will be followed. The site will be wetted before blasting. Blasting will be done around noon.
- Non-electric shock tube initiating system and Noiseless Trunkline Delay detonators and IKON (Digital Electronic System) will be used to keep the air blast levels to the lowest possible limits and minimize noise and vibration.
- Ground vibrations will be continuously monitored during blasting using Minimate Seismograph, through study of the peak particle velocity at different distances.
- Hydraulic rock breaker will be used to eliminate the use of secondary blasting.
- Combination of primary rock breaker and backhoe will be used for efficient collection and loading.
- Compaction, gradation and proper drainage will be provided for haul roads.
- Haul roads in mines will be stabilized. Vehicular speed in mines area will be restricted to 20 kmph.
- Depression area within the worked out site will be converted to water body. The water body will act as water reservoir.
- Plantation shall be done on both side of road

Air quality dispersion modelling study was conducted and it proved that the ambient air and noise quality of the area will remain well within the national ambient air quality and noise standards. No wastewater will be generated during mining. No toxic chemicals or wastes will be handled in the mines. Diesel and Explosives will be stored as per approval obtained from Chief Controller of Explosives. Exposure to dust and respiratory disorders, noise induced hearing loss, mechanical injury to body parts are the identified occupational hazards. The workers will be checked during employment and then regularly shall be checked for any clinical complaints and abnormal symptoms by the medical team of ACL. Workers will be given personal protective equipment like nose mask, ear plugs/muffs, safety boots, gloves, goggles, etc as well as clean drinking water and toilet facility. Drivers and their attendants will be given rest room facility, complete with toilet, bathroom and recreation facility. Canteen facility will be provided for all workers and drivers. Regular training and awareness programs will be conducted for the workers so that they are aware

of the work hazards, vector borne diseases, HIV, etc and will develop the behaviour of using protective equipment.

**Impact on Groundwater:** Blasting and mining will lead to opening up of fractures and fissures thereby improving groundwater flow. Development of secondary porosity by cracks and joints will also enhance the transmissivity and specific yield of aquifer. Seepage water will accumulate in the mining pits. The accumulated water will be used for dust suppression. During rainy season the surplus accumulated water will be discharged into nearby nalla.

**Risk Mitigation Measures:** Explosion in magazine, fire in diesel drums, mechanical injury to body parts are main the risks and accident hazards in the mine. All safety measures recommended by the IBM shall be implemented. An effective communication system comprising landline and mobile phones facilities will be made available at the mine site. Ground vibration measurements will be carried out and blasting will be done as per recommendation. The ground vibration will be maintained within limit, so as to ensure safety of surrounding buildings and houses of villagers. Blasting technology selected for this operation will ensure that flyrocks are kept to the minimum and blast waves are of lower magnitude. The water pits will be properly fenced and warning signals and signboards put at various places of reservoir at the end of mine life.

#### **4.0 Environmental Monitoring Program**

EMD will be established by recruiting skilled & experienced staff. EMD will be responsible for the following functions: Regular monitoring of –

- Regular Ambient air quality monitoring at upwind & downwind direction as per norms.
- Regular Fugitive dust emission monitoring as per norms.
- Regular analysis of ground water quality of mine site (seepage water), and all surrounding villages, as per norms. The depth of water will be checked every year during May and November.
- Regular analysis of water quality of canals and village ponds.
- Development of greenbelt at mine boundary and greenery inside the mining lease area, as per norms.

## **5.0 Project Benefits**

Limestone mining will generate substantial revenue for the state of Chhattisgarh, through optimal utilization of natural resource and royalty. The project will boost the infrastructure development of the area. 78 workers will get direct employment and about 100 people will get indirect employment in this project. Local people will be preferred for jobs, depending upon their skill and experience. Transport business, vehicle drivers and attendants, repairing workshops, grocery and retail stores, school, coaching centers, restaurants, self-employed persons like tailors, carpenters, plumbers, electricians, etc will get indirect employment / livelihood opportunity from this project. The company will spent Rs.250 lakhs for various social and developmental activities in the field of education, health, sports, sanitation, cleanliness, drinking water, infrastructure development, etc.

## **6. 0 Environmental Management Plan (EMP)**

EMP for effective management of environmental impacts due to the mining activity and ensuring overall protection of the surrounding environment through appropriate management procedures has been prepared. The capital cost for environmental management of the proposed mine is estimated to be Rs.180 Lakhs. This amount shall be used for procurement of Fugitive Dust Suppression systems like road side water sprinkling system and water tanker with rain gun and other facilities for suppressing the dust. Monitoring devices for ambient air, noise monitoring, and environment cell already exists. Workers health shall be checked as per norms. About Rs.80 Lakhs would be required as annual recurring expenses.

EMD will ensure that all pollution control devices function effectively. EMD will supervise disposal of spent oil and lubricants and used batteries to the authorized SPCB/CPCB vendors. Plantation will be started from day one and continue throughout the life of the project. Schemes for resource conservation, rainwater harvesting and social forestry development will be taken up. Regular environment, safety and health awareness programs for the workers will be conducted.

EMD will interact with the regulatory authorities, submit the monitoring reports and consent applications. The implementation of EMP would ensure that all elements of project comply with relevant environmental legislation throughout the mine life.