EXECUTIVE SUMMARY OF DRAFT EIA-EMP REPORT

For

EXPANSION OF LIMESTONE PRODUCTION CAPACITY OF M/S. JK LAKSHMI CEMENT LTD., LIMESTONE MINES (MINE LEASE II OF AREA 252.105 HA.) PRODUCTION CAPACITY FROM 0.3 MILLION TPA TO 1.35 MILLION TPA, FOR WHICH TOP SOIL: 0.0243 MILLION TPA OVERBURDEN: 0.0972 MILLION TPA, INTER BURDEN: 0.0945 MILLION TPA, TOTAL EXCAVATION (ROM): 1.566 MILLION TPA)

LOCATED AT

VILLAGES SEMARIYA, GHIKURIA & NANDINI KHUNDINI, TEHSIL-DHAMDHA, DISTRICT- DURG (CHHATTISGARH)

Terms of Reference File No. 3-110105/73/2020-IA-II(M) on 20th January, 2021
Category: Category A or Activity 1 a) Mining of Minerals
Monitoring Period: Winter Season (1st Dec, 2023 – 29th Feb, 2024)

PROJECT PROPONENT

JK LAKSHMI CEMENT Ltd.

ENVIRONMENTAL CONSULTANT

ANACON

M/s. ANACON LABORATORIES PVT. LTD., NAGPUR

QCI - NABET Accredited EIA Consultant
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Report No. ANqr/PD/20A/2024/248(B)

SEPTEMBER 2024

EXECUTIVE SUMMARY

1.0 INTRODUCTION

M/s JK Lakshmi Cement Ltd. (JKLCL) has an existing Integrated Cement Plant with capacities – Clinker -1.98 Million TPA (MTPA), Cement (OPC, PPC, PSC, COC) - 5.0 MTPA, CPP - 20 MW, WHRB- 10 MW & Limestone 4.8 MTPA at Villages: Malpuri Khurd, Khasadih, P.O. Ahiwara, Dist. Durg, Chhattisgarh and environmental clearance for the existing Cement Plant was issued by MoEF&CC, New Delhi vide their letter no. J-11011/1170/2007-IA II (I) dated 13th May, 2009 and amendments done thereafter.

JK Lakshmi Cement Ltd. has an integrated cement plant, interlinked with captive limestone mines Lease areas (ML- I of 267.695 ha. and ML- II of 252.105 ha.) having single EC. The clinker capacity was enhanced from 1.5 Million TPA to 1.98 Million TPA through optimization and modernization by obtaining EC amendment in F. No. J-11011/1170/2007-IA-II(I) dated 14th November 2018

M/s. JK Lakshmi Cement Ltd. is now proposing an expansion of its Integrated Cement Plant Accordingly ToR was granted by EAC (Industry – I), MoEFCC, New Delhi vide file No. IA-J-11011/1170/2007-IA-II(I), dated 24th August, 2020. The details of which are as follows:

- Clinker from (1.98 Million TPA to 5.0 Million TPA)
- Cement (PSC, PPC, OPC & COC) from (5.0 to 6.0 Million TPA)
- Captive Power Plant from (20 MW to 40 MW)
- WHRB from (10 MW to 25 MW)
- DG sets (1000 to 2000 KVA).
- Limestone (4.8 MTPA to 8.0 MTPA)

Being Integrated Cement Plant, interlinked with limestone mines (2 Nos.) with single EC as mentioned above, JKLCL received ToR for Captive Limestone mine from EAC (Non-Coal), MoEFCC, New Delhi to sustained continuous supply of Limestone from captive mines in conformity with Cement Plant expansion capacity. Thus, following ToR are received separately for plant and mines, hence separate EIA is submitted as per TOR received. Details of ToR of for Plant and captive limestone mines are as under:

1. ToR granted for *M/S. JK Lakshmi Cement Ltd., Limestone mines (**Mine Lease I of area 267.695 Ha.**) vide F.* No. J-110105/72/2020-IA. II(M) dt. 20th Jan, 2021
2. ToR granted for *M/S. JK Lakshmi Cement Ltd., Limestone mines (**Mine Lease II of area 252.105 Ha.**) vide* F. No. J-110105/73/2020-IA. II(M) dt. 20th Jan, 2021.

Hence, in line with the ToR separate EIA-EMP report are prepared for ***Mine Lease I of area 267.695 Ha.*** *and* ***Mine Lease II of area 252.105 Ha.***

Thus, this EIA-EMP report is prepared for ***Mine Lease II of area 252.105 Ha.*** to expand limestone production from Mine lease area ML-II of 252.105 ha, from the current EC capacity 0.3 million TPA to 1.35 milion TPA for which top soil: 0.0243 million TPA overburden: 0.0972 million TPA, interburden: 0.0945 million TPA, all of which forms a total excavation of ROM 1.566 million TPA at Village Samariya, Ghikuria and Nandani Khundini, Tehsil - Dhamdha, District - Durg, Chhattisgarh.

The Total estimated geological reserves for ML-II of 252.105 ha as on date are about is 63.42 Million tonnes, the reserves of limestone get further enhanced after extensive detailed exploration in some parts of mining lease area which is still to be explored.

As per EIA Notification dated 14th Sept. 2006 & as amended; this project falls under Category "A"; Project Activity '1(a)' Mining of Minerals.

Anacon Laboratories Pvt. Ltd., Nagpur, is QCI-NABET accredited in 'Category A' environment consultant organization has been assigned to undertake an Environmental Impact Assessment (EIA) study and preparation of Environment Management Plan (EMP) for various environmental components, which may be affected due to the impacts arising out of the proposed project.

The Environmental Impact Assessment (EIA) and Environment Management Plan report is prepared for obtaining Environmental Clearance (EC) from MoEF&CC, New Delhi and the Consent for Establishment from the Chhattisgarh Environment Conservation Board (CECB) for the proposed expansion project.

1.1 IDENTIFICATION OF PROJECT

M/s. JK Lakshmi Cement Limited (JKLCL) proposes to install expansion of the existing manufacturing unit capacity of **Integrated Cement Plant**, Clinker (1.98 Million TPA to 5.0 Million TPA), Cement (5.0 Million TPA to 6.0 Million TPA), CPP (20 MW to 40 MW), WHRB (10 MW to 25 MW), DG Set (1000 KVA to 2000 KVA), at Villages Malpuri Khurd, Khasadih. PO. Ahiwara, Tehsil Ahiwara, District - Durg (Chhattisgarh), and **Limestone (4.8 Million TPA to 8.0 Million TPA)**. The plant has two Captive Limestone mines of mine lease areas ML- I of 267.695 Ha and ML - II of 252.105 Ha at village Semaria, Ghikuria and Nandini - Khudani, Tehsil - Dhamdha, District Durg, CG. These mines are interlinked with Integrated Cement plant.

Both the leases ML- I and ML- II are contiguous, such that ML-I is surrounded all round by ML-II. Mine lease area ML- II (252.105 ha.), has nine Blocks. The nine leases are operated differently.

Now the applicant is seeking for expansion of the production mining of limestone in its existing ML-II (252.105 ha.) environmental clearance as per EIA Notification, 2006

The current proposal is expansion of production capacity of Limestone Mines in conformity with expansion of the existing manufacturing unit capacity of Integrated Cement Plant. The details of existing and expansion production capacity are given in **Table 1.**

TABLE 1: EXISTING AND EXPANSION PRODUCTION DETAILS

Product	Existing EC Capacity (Since combine EC was issued for both mines vide F. No. J- 11011/1170/2007-IA II(I) on dated 13th May, 2009)	Proposed Additional Capacity expansion	Total Capacity after expansion from mining lease area 252.105 ha.	Remarks
Limestone	4.8 million TPA from both mining leases (267.695 ha & 252.105 ha) Under Operation: 3.5 million TPA (0.3 million TPA from 252.105 ha & 3.2 million TPA from 267.695 ha) Lease wise limestone Total production (4.8 MTPA) bifurcation: ML-II (252.105 ha) : 0.3 million	1.05 million TPA	Lime Stone: 1.35 million TPA Top Soil: 0.0243 million TPA Overburden: 0.0972 million TPA Interburden : 0.0945 million TPA Total Excavation (ROM) : 1.566 million TPA	Its Limestone capacity expansion from 0.3 million TPA to 1.35 million TPA from Mining lease area 252.105 ha. However, the cumulative net limestone mineral mining production capacity shall be 8.0 million from both lease with Top Soil :0.0536 million TPA; Overburden: 0.20094

Product	Existing EC Capacity (Since combine EC was issued for both mines vide F. No. J- 11011/1170/2007-IA II(I) on dated 13th May, 2009)	Proposed Additional Capacity expansion	Total Capacity after expansion from mining lease area 252.105 ha.	Remarks
	TPA ML – I (267.695 ha) : 4.5 million TPA			million TPA; Interburden: 0.6265 million TPA. **Total Excavation (ROM): 8.881 million TPA.** Note: Separate ToR for ML – I and ML- II are granted.

1.2 LOCATION OF THE PROJECT

The mine is located at village Semaria, Ghikudia & Nandini-Khudani, Tehsil Dhamdha, District-Durg, CG. The area falls between Latitudes N 21° 24' 6.35" - N 21°25'47.34" Longitudes E 81° 23' 9.00" - E 81°24'58.73" and is covered by Survey of India Toposheet No. 64 G/7, 64G/6, 64G/11 on 1: 50,000 scale. The detailed co-ordinates of boundary pillars of mine provided in **Table 2.**

The nearest city Bhilai is around 22.30 KM in SSW direction. Nearest airport is Swami Vivekananda Airport, Raipur is around 41.65 km at SE direction. The project site can be reached through State Highway (SH7) is 2.76 km towards WSW direction. The project is well connected to all weather roads. Nearest railway station is Kumhari railway station which is 20.6 km SE direction. The details of environmental setting are given in **Table 2.**

1.3 EIA/EMP REPORT

In line with the approved ToR obtained from EAC (Non- Coal), MoEF&CC, New Delhi, baseline environmental monitoring was conducted during Winter Season **(1st Dec 2023 – 29th Feb. 2024)** for determining the status of ambient air quality, ambient noise levels, surface and groundwater quality, soil quality, status of flora, fauna and eco-sensitive areas and socio-economic status of the villages within 10 km radius study area from the project site **(Figure 1)**. The observations of the studies are incorporated in the EIA/EMP report. Impacts of the proposed project activities during construction and operation stages were identified and duly addressed in the report.

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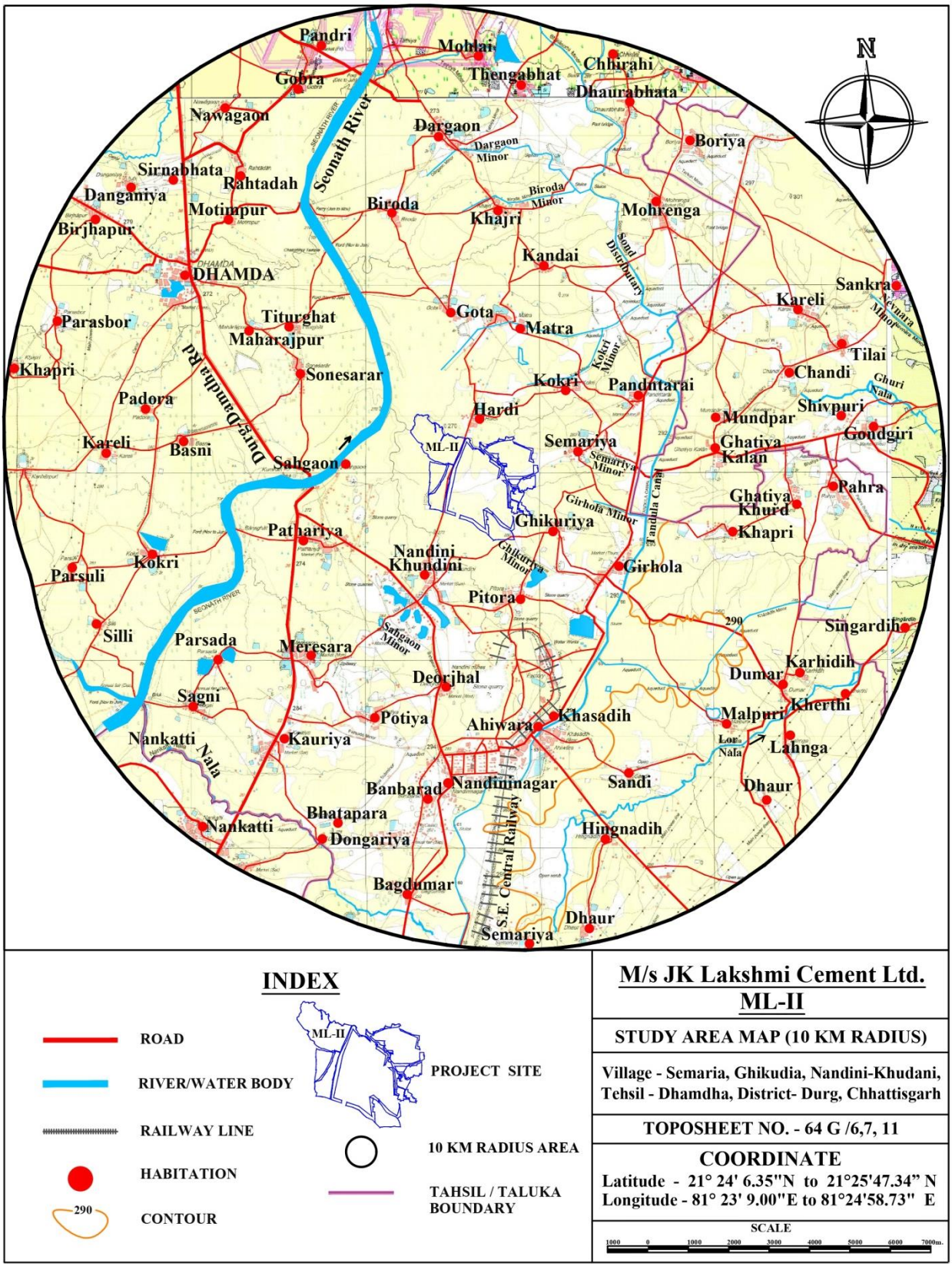

FIGURE 1: STUDY AREA (10 KM RADIAL DISTANCE)

TABLE 2: DETAILS OF ENVIRONMENTAL SETTINGS

Sl.	Particulars	Details
1.	Project Location	**Mine Lease area ML- II of 252.105 ha** Village-Village Semaria, Ghikuriya and Nandani Khundini, Tehsil-Dhamdha, District-Durg, State-Chhattisgarh
2.	Latitude/Longitude	Latitudes N 21° 24' 6.35" - N 21°25'47.34" Longitudes E 81° 23' 9.00" - E 81°24'58.73"
3.	Climatic Conditions	Mean annual rainfall is 1252.8 mm Temperature: Pre monsoon 20.6^{0}C (Min.) 41.7^{0}C(Max.) : Winter 13.3^{0}C (Min.) 31.0^{0}C (Max) : Post monsoon 17.3^{0}C (Min.) 31.8^{0}C(Max.) Source: IMD, Raipur
4.	Location covered in Toposheet No	64G/7, 64G/6, 64G/11
5.	Nearest representative IMD Station	IMD Raipur-33.35km/SE
6.	Site elevation above Mean Sea Level	265 m to 281 m
7.	Nearest roadway	1. SH7-Durg Dhamdha Road-2.76km/WSW 2. NH53-19.50km/SE 3.Nandini Road-1.8km/SW
8.	Nearest Railway Station	Kumhari Railway Station-20.62km/SE
9.	Nearest Air Port	Swami Vivekananda Airport, Raipur-41.65km/SE
10.	Nearest village	Ghukuriya Village - 0.43km/ESE Semaria Village -0.56km/E Nandani Khundini -1.07km/S
11.	Nearest Port	Gopalpur Port-437.20km/SE
12.	Distance from Sea Coast	Bay of Bengal-433.50km/SE
13.	Nearest major city with 2,00,000 population	Bhilai-22.30km/SSW
14.	Nearest State/National Boundaries	Madhya Pradesh-67.38km/W
15.	Hills/Valleys	None within 10 km radius area
16.	Ecologically sensitive zone	None within 10 km radius area
17.	National Parks, Wildlife Sanctuaries, etc.	None within 10 km radius area
18.	Nearest Reserved / Protected forests	None within 10 km radius area
19.	Historical/Tourist places	None within 10 km radius area
20.	Nearest Industries	

Sr. No.	Name	Distance (Km)	Direction
1	Nandini Limestone Mines	3.3	S
2	Nandini Limestone Crushing Plant	3.3	SSE
3	HTC Limestone Mines	3.5	WSW
4	HKS Mine	1.96	SW
5	S.S.N. Crusher	5.15	SSW
6	Vaibhav Industries	6.97	WNW
7	Shri Gopal Ahar Udyog	6.54	WNW
8	Sant Hardas Ram Industries	5.56	SW
9	Semaria Limestone Mine	Adjoining	E
10	J.J. Agri Seeds, Semaria	2.30	E
11	JK Lakshmi Cement Ltd.	4.51	SE

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<tr><th>Sl.</th><th>Particulars</th><th>Details</th></tr>
<tr><td>21.</td><td>Nearest Water Bodies</td><td>
<table>
<tr><th>Sr. No.</th><th>Name</th><th>Distance (Km)</th><th>Direction</th></tr>
<tr><td>1</td><td>Shivnath River</td><td>0.75</td><td>NW</td></tr>
<tr><td>2</td><td>Lor Nala</td><td>7.2</td><td>SE</td></tr>
<tr><td>3</td><td>Ghuri Nala</td><td>8.5</td><td>NE</td></tr>
<tr><td>4</td><td>Girhola Minor</td><td>1.54</td><td>E</td></tr>
<tr><td>5</td><td>Semaria Minor</td><td>2.37</td><td>ENE</td></tr>
<tr><td>6</td><td>Ghikuriya Minor</td><td>Adjacent</td><td>SE</td></tr>
<tr><td>7</td><td>Sahgaon Minor</td><td>2.32</td><td>WSW</td></tr>
<tr><td>8</td><td>Seasonal Drainage</td><td>Adjacent & within mine</td><td>E</td></tr>
<tr><td>9</td><td>Kokri Minor</td><td>1.09</td><td>N</td></tr>
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</td></tr>
<tr><td>22.</td><td>Archaeological Sites</td><td>None within 10 km radius area</td></tr>
<tr><td>23.</td><td>Religious Places</td><td>
<table>
<tr><th>Sr. No.</th><th>Name</th><th>Distance (Km)</th><th>Direction</th></tr>
<tr><td>1</td><td>Sai Mandir Ahiwara</td><td>4.91</td><td>SSE</td></tr>
<tr><td>2</td><td>Shiv Mandir Dhamdha</td><td>6.66</td><td>WNW</td></tr>
<tr><td>3</td><td>Shiv Mandir Semariya</td><td>0.97</td><td>E</td></tr>
<tr><td>4</td><td>Shri Krishna Mandir Nandini</td><td>1.78</td><td>SSW</td></tr>
<tr><td>5</td><td>Shri Vishnu Mandir, Banbarad, Ahiwara</td><td>7.34</td><td>SSW</td></tr>
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<tr><td>24.</td><td>Hospitals and Education Institutions (Sensitive Manmade Landuse)</td><td>
HOSPITALS
<table>
<tr><th>Sr. No.</th><th>Name</th><th>Distance (Km)</th><th>Direction</th></tr>
<tr><td>1</td><td>Dr. Rachana Agrawal Hospital</td><td>6.92</td><td>NW</td></tr>
<tr><td>2</td><td>Life Line Multispeciality Hospital Dhamdha</td><td>5.86</td><td>WNW</td></tr>
<tr><td>3</td><td>Ayushman Arogya Mandir / Sub Health Center Pathariya</td><td>2.84</td><td>WSW</td></tr>
</table>
EDUCATIONAL INSTITUTIONS
<table>
<tr><th>Sr. No.</th><th>Name</th><th>Distance (Km)</th><th>Direction</th></tr>
<tr><td>1</td><td>Shree Sai College, Deurjhal</td><td>3.44</td><td>SSW</td></tr>
<tr><td>2</td><td>Govt College, Sirnabhatha,</td><td>8.53</td><td>NW</td></tr>
<tr><td>3</td><td>Pitaura School, Pitaura</td><td>1.20</td><td>S</td></tr>
<tr><td>4</td><td>Sky International School</td><td>9</td><td>NW</td></tr>
<tr><td>5</td><td>Government Higher Secondary School Semaria, Semaria, Pendritarai</td><td>2.5</td><td>E</td></tr>
<tr><td>6</td><td>Government Primary School Hardi</td><td>0.5</td><td>N</td></tr>
<tr><td>7</td><td>Govt. Primary School Sahgaon</td><td>2.07</td><td>W</td></tr>
<tr><td>8</td><td>Govt H S School Nandini</td><td>2.05</td><td>SSW</td></tr>
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Sl.	Particulars	Details
		Khundini
		9 DAV Ispat Public School, Nandini Mines 5.25 S
25.	Community Places	None within 10 km radius area
26.	Seismic zone	Site falls in zone-II as per IS 1893 (Part-I): 2002. Hence, seismically it is a stable zone.
27.	Areas already subjected to pollution or environmental damage under CPA/SPA	None within study area

2.0 PROJECT DESCRIPTION

2.1 PROCESS DESCRIPTION

2.1.1 Details about method of mining

The mining of limestone is being carried out by highly mechanized open-cast mining system. Emphasis is given to scientific mine planning by adopting adequate pollution control techniques while mining. The limestone of the lease area is medium hard and is characterized by fine to occasionally medium grains material. Open cast mining would be continued for raising limestone by adopting conventional method of drilling and blasting. The operations comprise pre-production development stage and the production stage. During the pre-production stage haul roads are laid and the faces are developed and made ready for raising limestone.

Present Method of Mining

As being practiced, the mining would be undertaken by the open-cast mining method. In this area, bench height in ore and overburden will not be more than 8–10 m. The bench width of benches will be more than the height of the bench, or the width will be three times that of the largest dumpers, or the width of the widest machinery plus five meters. During work, a bench slope of 80–90 degrees will be maintained. At the end of the work, an ultimate pit slope of 45 degrees shall be considered. The bottom mRL proposed during the plan period is 208 mRL.

Process Involved- Excavation, Loading, Transportation, Crushing and Screening.

2.2 LAND REQUIREMENT

This is an existing operational mine, the mining lease is valid up to 27/12/2066 as per Mines and Minerals (Development and Regulation) Amendment Act, 2015. The detail of land use planning is provided in **Table 3**.

TABLE 3: LAND USE PATTERN

Land Use Category	Area covered at present (present-2024)	At end of plan period including expansion	At end of lease period/mineral exhausted
Area under pit for mining	3.91	22.81	154.45*
Area under Roads	0.5	0.5	0
Area under Infrastructure	0.82	0.82	0
Area under Top Soil Stack	0	0	0
Area under OB Dump/Soil	0	12.03	0
Area to be back filled	0	0	30*
Area under Plantation	10.2	5	97.655
Total			**252.105**

Note :- 30 Ha. Area will be back filled from 154.45 ha. of exhausted area at the end of lease period thereby 124.45 ha. will be created as reservoir.

***Source**: Proposed draft Mining plan & Progressive Mine Closure Plan*

2.3 WATER REQUIREMENT & SOURCE

The overall water requirement of after expansion of Integrated Cement Plant including Captive Limestone mine is **6680 KLD.** The total water requirement (including ML-I & ML-II) is 415 KLD out of which existing water requirement is 200 KLD whereas proposed water requirement will be 215 KLD for both mine lease areas. Water is being required for various mining activities including drinking. Water is obtained from the Shivnath anicut Dam/RWH pit/ boreholes. Water for mining operations is being sourced through Shivnath river.

Permission from WRD, Raipur for use of Shivnath River water has been taken. The existing plant have permission from CGWB for abstraction of Ground water 320 KLD. Ground water is only being used for Domestic purpose and horticultural purposes. Existing groundwater permission is sufficient to carry out the proposed project expansion. The details of water requirements are provided in **Tables 4 & 5**.

TABLE 4: WATER REQUIREMENTS (UNIT IN KLD)

Activity	Particulars	Existing (KLD)	Additional requirement (KLD)	Total (KLD)
Industrial	Plant	1500	1260	2760
	CPP	375	375	750
	WHRB	225	350	575
	Mines (ML-I & ML-II)	200	215	415 (ML-I 255 & ML-II 160)
Domestic	Plant & Office	120	50	170
	Canteen	20	35	55
	Workers Colony	95	0	95
Green Belt / Plantation		760	1100	1860
Total		**3295**	**3385**	**6680**

TABLE 5: WATER REQUIREMENT FOR ML-II AREA IN KLD

Sr. No.	Particulars	Source	Quantity in KLD
1	Dust suppression	Shivnath River	125
2	Drinking & sanitation	Borewell	20
3	HEMM Washing and Miscellaneous	Shivnath river, Treated water	15
Total			**160**

2.4 MAN POWER REQUIREMENT

M/s JKLCL Limestone Mine are being supervised and controlled by a team of technically and statutorily qualified personnel apart from the operating staff of skilled, semi-skilled and unskilled categories. Following manpower has been deployed for mining operations for both ML-I and ML-II mine lease areas, which are as follows:

The list of Manpower for mine ML-II is shown in **Table 6.**

TABLE 6: MANPOWER REQUIREMENT

Sr. No.	Man Power	Existing (In Nos.)	Proposed (In Nos.)	Total Manpower after expansion
1	Mining Engineer/ Mines Manager (23 years experienced)	00	00	00
1a	Mines Manager (Ist class certificate holder)	01	00	01
1b	Mining Engineer (5 years experienced)	01	00	01
2	Geologist (7 years and 5 years experienced)	01	00	01
3	Blasting Officer (1st class Mine manager certificate)	00	00	00
4	Assistance Mine manager		02	02
5	Blasting Foreman	01	00	01
6	Mine Foreman	00	03	03
7	Mining Mate	01	02	03
8	Blaster	01	00	01
9	Surveyor	00	00	00
10	Mechanical Technician	01	00	01
11	Technician (mech + elec)	00	00	00
12	Skilled, semi-skilled & Un-skilled labours	10	20	30
Total		**17**	**27**	**44**

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

Note: After expansion the workforce structure like machine operators, drivers and labours for maintenance of roads, making drains, Plantation, fencing and other miscellaneous works will be carried out by contractual basis. As per the provisions of Rule 55 of MCDR 2017, full time mining engineer and geologist have been employed.

2.5 POWER REQUIREMENT

Electricity is required about- 33 KVA which will be provided through the existing Waste heat recovery unit and Solar power plant of Integrated Cement Plant and also its Existing DG Set is about 40 KVA and proposed will be 40 KVA DG set for emergency purpose.

Apart from this consumption of Diesel – 0.4 liter per tonne for excavation of limestone and 0.26 liter/ tonne mines to plant in transportation purpose which can be utilized for excavators, dumpers, dozers, etc. at the place of working itself. The Diesel requirement is being fulfilled from company's own diesel filling stations having capacity of (20KL x 2) 40 KL.

2.6 CONCEPTUAL MINE PLAN

Mining is being carried out by opencast Fully-mechanized mining method. Mining process start with controlled blasting, and excavation and loading of limestone is being carried out with the help of hydraulic excavators. Limestone thus loaded is transported by dumpers to crusher from where the crushed material is transported via closed pipe conveyor to the captive cement plant. Besides crushing no other means operation for up gradation of limestone is to be carried out at mine. Hence, no beneficiation will be done at mine site.

The other mining details in tabulated forms are provided in **Table. 7.**

TABLE 7: MINING DETAILS

S. No.	Particulars	Details
1.	Method of mining	Fully mechanized Open Cast Mining
2.	Area	252.105 Ha.
3.	Production Capacity	Prod. Cap. From 0.3 Million TPA to 1.35 Million TPA
4.	Stripping Ratio	1:0.136
5.	Bench Height and Width	Height: 6 m Height. Width: More than the bench height
6.	Land Type	Waste Land
7.	Ultimate working depth	ML area is in 9 blocks and avg. depth is 54 m.
8.	Life of Mine	47 yrs
9.	Elevation Range	Highest elevation:281 mRL Lowest elevation: 264.5 mRL
10.	Water requirement	The total water requirement (including ML-I & ML-II) is 415 KLD out of which existing water requirement is 200 KLD whereas proposed water requirement will be 215 KLD for both mine lease areas.
11.	Source of Water	Shivnath River and Ground water
12.	Commencement of Mining	It is an existing operational mine seeking EC for expansion under EIA notification 2006
13.	Top Soil Thickness	5-7 m
14.	Number of working days	300 days/year

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

2.2 WASTE GENERATION & DISPOSAL

2.2.1 Nature of Waste

In mine lease area there are bands of Shaly and high magnesian limestone in between at places as interburden. which will be blended with high grade limestone for utilization, being a mechanized mines this intermittent shaly & high magnesian limestone at places can't be separated, hence consumed . Solid Waste generated is in the form of Soil, murrum & Interstitial clay (OB)will be stacked separately and used for plantation purposes . There is no generation hazardous waste in our mine.

The soil would be scrapped and stacked separately and will be utilized for plantation purpose. The stacking would be for a temporary duration and the soil thus stacked will be used in re-vegetation/plantation schemes. The year-wise generation of top soil, waste and sub grade material is given in the table below:

TABLE 8: DETAILS OF OVER BURDEN AND TOP SOIL HANDLED DURING EXCAVATION

Year	Top soil (T)	OB/waste (T)	Sub grade (T)
2024-25	9000	30000	-
2025-26	-	-	-
2026-27 (Proposed)	10318.56	342620	-
2027-28 (Proposed)	3671.88	107744	-
2028-29 (Proposed)	2148.96	125356	-

2.3 PROJECT COST

The Capital cost of mining project is **Rs. 53 Cr. (i.e., Rs. 5300 Lakhs)**. The cost of EMP is of Rs. **1058.5 Lakhs** (Existing Capital Cost of EMP Rs. **530.8 Lakhs +** Additional Capital Cost of EMP **Rs. 527.7 Lakhs).**

3.0 EXISTING ENVIRONMENTAL SCENARIO

3.1 BASELINE ENVIRONMENTAL STUDIES

Baseline environmental studies were conducted at project site along with 10 km from the boundary limits of the mine lease area. The baseline environmental quality data for various components of environment, viz. Air, Noise, Water, and Land were monitored during **winter-Season (1st Dec 2023 – 29th Feb 2024).** The details are as under:

3.2 METEOROLOGY & AMBIENT AIR QUALITY

Summary of the Meteorological Data Generated at Site (1st Dec 2023 – 29th Feb 2024)

Predominant Wind Direction	Period: Winter Season (1st Dec 2023 – 29th Feb 2024)
First Predominant Wind Direction	E (20.74%)
Second Predominant Wind Direction	ENE (18.64%)
Calm conditions (%)	1.97
Avg. Wind Speed (m/s)	2.20

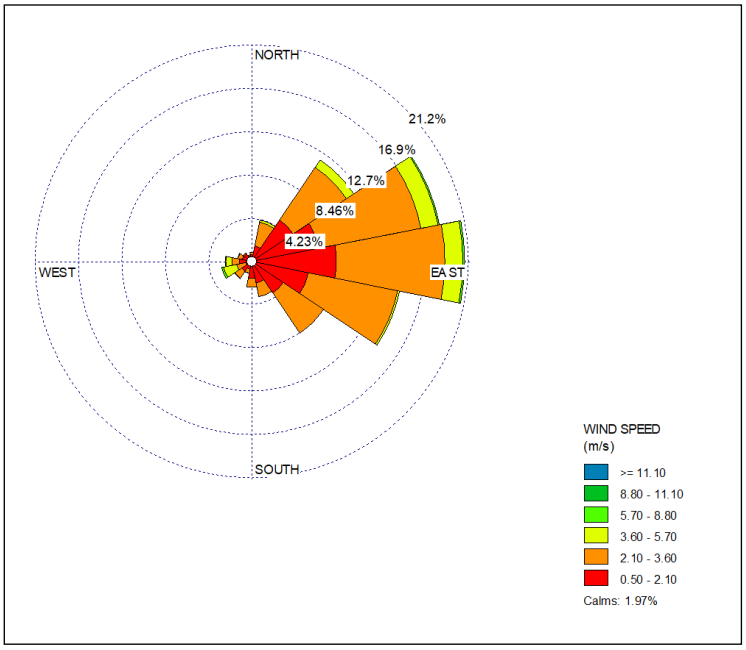

FIGURE 2: SITE SPECIFIC WINDROSE (1ST DEC, 2023 – 29TH FEB, 2024)

The status of ambient air quality within the study area was monitored for winter season at 8 locations. All these 8 sampling locations were selected based on the meteorological conditions considering upwind and downwind, cross wind directions and reference point. The levels of Respirable Particulate Matter (PM_{10}), Fine Particulates ($PM_{2.5}$), Sulphur Dioxide (SO_2,), Oxides of Nitrogen (NO_X) and carbon monoxide (CO), Ammonia, Ozone, Lead, Arsenic, Nickel, Benzene and BAP were monitored. The details of Ambient Air Quality Monitoring Results are summarized and given in **Tables 9 & 10**.

TABLE 9: SUMMARY OF AMBIENT AIR QUALITY MONITORING RESULTS

Sr. No.	Location		PM_{10} µg/m^3	$PM_{2.5}$ µg/m^3	SO_2 µg/m^3	NO_2 µg/m^3	CO mg/m^3	Ozone µg/m^3	NH_3 µg/m^3
1	Project Site (ML-II)	Min	50.7	20.2	6.4	12.6	0.242	3.8	4.3
		Max	67.6	27.3	11.2	20.3	0.380	9.4	9.8
		Avg	59.0	23.8	8.8	16.2	0.328	6.8	7.3
		98th	66.8	27.2	10.9	19.5	0.380	9.2	9.8
2	Semaria	Min	50.4	18.5	7.4	12.4	0.279	5.3	5.5
		Max	68.3	29.4	11.6	23.2	0.407	7.4	10.0
		Avg	57.8	23.6	9.2	18.1	0.327	6.4	7.9
		98th	67.1	29.3	11.1	23.0	0.391	7.3	9.7
3	Khapri	Min	40.2	16.5	5.3	11.5	0.224	4.6	6.4
		Max	56.4	25.5	9.3	17.9	0.292	7.2	10.3
		Avg	48.8	20.5	6.8	14.4	0.257	6.1	8.6
		98th	56.3	25.1	8.9	17.3	0.288	7.1	10.3
4	Kokri (Nr. Pandntarai)	Min	47.8	20.1	7.9	13.0	0.286	4.7	5.8
		Max	66.6	29.8	12.3	19.4	0.370	9.8	10.2
		Avg	58.7	24.2	9.2	16.1	0.326	6.9	8.0
		98th	66.4	29.2	11.5	19.3	0.367	9.3	10.1
5	Patharia	Min	52.6	19.4	6.5	14.8	0.246	4.9	6.3
		Max	67.5	27.8	11.7	23.2	0.384	9.2	10.6
		Avg	60.1	23.4	8.8	18.6	0.316	7.2	8.3
		98th	66.5	27.2	11.5	22.9	0.379	9.0	10.3
6	Deorjhal	Min	43.4	19.8	5.2	14.7	0.234	5.2	6.9
		Max	64.6	28.0	11.5	23.1	0.365	9.8	11.6
		Avg	54.2	23.4	8.3	18.5	0.300	7.7	9.1
		98th	64.5	27.6	11.4	22.8	0.360	9.6	11.3
7	Sahgaon	Min	52.5	19.5	5.2	10.9	0.257	4.9	4.6
		Max	63.2	27.4	10.2	23.8	0.306	8.4	9.5
		Avg	57.3	24.0	7.7	17.5	0.281	6.4	7.2
		98th	62.7	27.1	10.1	23.1	0.305	8.4	9.1
8	Nandini	Min	44.6	14.3	4.6	10.3	0.196	4.8	6.1
		Max	64.2	29.8	9.8	21.4	0.343	9.0	10.1
		Avg	53.2	22.8	7.1	16.8	0.265	6.8	8.2
		98th	63.1	28.7	9.5	21.4	0.340	8.8	10.1
CPCB Standards			**100 (24hr)**	**60 (24hr)**	**80 (24hr)**	**80 (24hr)**	**2 (8hr)**	**100 (8hr)**	**400 (24hr)**

From the above results, it is observed that the ambient air quality at all the monitoring locations was within the permissible limits specified by CPCB.

3.3 AMBIENT NOISE LEVELS

Site of an area was selected to meet the manmade land use pattern as prescribed in the standard e.g. Industrial, Commercial, Residential and Silence Zone. Eight (8) locations were identified based on the activities in the village area, traffic and sensitive areas like hospitals and schools. Details are given in **Table 11.**

TABLE 11: SUMMARY OF AMBIENT NOISE LEVEL MONITORING RESULTS

Station Code	Monitoring Locations	Equivalent Noise Level	
		Leq_{Day}	Leq_{Night}
Industrial Area			
N-1	Project Site-ML II Area	56.1	48.7
N-3	Girhola	64.8	56.2
N-7	Pitora	57.3	46.1
CPCB Standards dB(A)		**75.0**	**70.0**
Residential Area			
N-2	Nandini	47.1	39.7
N-8	Khapri	51.7	42.9
CPCB Standards dB(A)		**55.0**	**45.0**
Commercial Area			
N-4	Haldi	54.1	47.9
N-5	Deorjhal	57.3	49.2
CPCB Standards dB(A)		**65.0**	**55.0**
Silence Zone			
N-6	Malpuri	45.9	38.1
CPCB Standards dB(A)		**50.0**	**40.0**

***Source**: Field monitoring and analysis by Anacon Laboratories Pvt. Ltd., Nagpur*

3.4 SURFACE AND GROUND WATER RESOURCES & QUALITY

3.4.1 Regional Geology

The limestone and associated formations which are occurring near this village is a part of Chhattisgarh Synclinorium and belonging to Chandi Formation of the Raipur Group of Chhattisgarh Supergroup. The limestone deposit is almost horizontally bedded with local dip from 2 degree to 5 degree towards north. The general strike of the limestone bed is east-west.

3.4.2 Local Geology:

The limestone is occurring all over the area. It is a bedded formation striking almost east-west. The general slope of the area is about 20 to 30. Limestone is found to be associated with inter-banded calcite veins at places. On the basis of bore-holes data, the lithological sequence is as under:

- Soil & Alluvium
- Purple grey/pinkish Limestone
- Pink siliceous shaly Limestone
- Siliceous /dolomitic Limestone

3.4.3 Hydrogeology and Aquifer Systems

The occurrence of groundwater and its distribution in space are highly influenced by the underlying geological formations and hydrogeological characteristics of the surroundings. The average thickness of the weathered portion in the area is around 10.7 m. The Pre-Monsoon depth to water Level 9.5 to 12.1 mbgl is observed in the study area and post-monsoon depth to water Level 1.5 to 7.8 mbgl is observed in major parts of the area. As per CGWA Categorization of Assessment Units as per Dynamic Ground Water Resources of India the area comes under Semi-Critical category.

3.4.4 Water Quality

Total 14 nos (8 from Ground water & 6 from Surface water sources) water samples were collected from various sampling locations within study area. The details of physic-chemical characteristics of the surface water and Ground Water are provided in **Table no. 12**.

TABLE 12: THE PHYSICO-CHEMICAL CHARACTERISTICS OF THE SURFACE WATER AND GROUND WATER

A - Surface Water Quality			B - Groundwater Quality		
Parameters	**Unit**	**Baseline Monitoring Period (1st Dec, 2023 – 29th Feb, 2024)**	**Parameters**	**Unit**	**Baseline Monitoring Period (1st Dec, 2023 – 29th Feb, 2024)**
		Range			**Range**
pH	-	7.16 – 8.17	pH	-	7.16 – 8.17
EC	µs/cm	602.25 – 940.24	EC	µs/cm	492.48 – 997.92
TDS	mg/l	365 – 584	TDS	mg/l	324 – 594
Total hardness	mg/l	190.76 – 278.82	Total hardness	mg/l	166.52 – 320.84
DO	mg/l	5.6 – 6.2	Chloride	mg/l	60.17 – 151.57
BOD	mg/l	2.76 – 5.19	Sulphate	mg/l	38.19 – 71.64
COD	mg/l	7.62 – 26.14	Nitrate	mg/l	12.54 – 34.76
Chloride	mg/l	67.92 – 125.42	Fluoride	mg/l	0.17 – 0.42
Sulphate	mg/l	22.5 – 97.87	Iron	mg/l	0.14 – 0.22
Nitrate	mg/l	7.85 – 32.68	Cadmium	mg/l	BDL (DL - 0.001)
Fluoride	mg/l	0.20 – 0.42	Arsenic	mg/l	BDL (DL - 0.01)
Iron	mg/l	0.47 – 0.88	Zinc	mg/l	BDL (DL - 0.01)
Cadmium	mg/l	BDL (DL - 0.001)	Lead	mg/l	BDL (DL - 0.001)
Arsenic	mg/l	BDL (DL - 0.01)	Chromium	mg/l	BDL (DL - 0.03)
Zinc	mg/l	BDL (DL - 0.1)			
Lead	mg/l	BDL (DL - 0.001)			
Chromium	mg/l	BDL (DL - 0.03)			
Total Coliform	MPN/ 100 ml	Present			
Faecal Coliform	MPN/ 100 ml	12 – 109			

BDL: *Below Detectable Limit.*

Location wise Water Quality Assessment

S. N.	Locations	WQI	Quality	Remark
1.0	Project site ML-II	59.52	Good	**Water quality assessed based upon above physico-chemical parameters and samples were found to be physico-chemically good.**
2.0	Semariya	77.51	Good	
3.0	Khapri	78.60	Good	
4.0	Kokri (Nr. Pandntarai)	57.97	Good	
5.0	Patharia	55.15	Good	
6.0	Deorjhal	72.85	Good	
7.0	Sahgaon	58.05	Good	
8.0	Nandini	53.86	Good	

Bacteriological Characteristics

Coliform group of organisms are indicators of fecal contamination in water. All surface water samples were found to be bacteriologically contaminated. Presence of total coliforms in surface water indicates that a contamination pathway exists between any source of bacteria (septic system,

animal waste, etc.) and the surface water stream. A defective well can often be the cause when coliform bacteria are found in well water. For surface water, treatment followed by chlorination or disinfection treatment is needed before use for domestic purpose. Groundwater samples were not found to be bacteriologically contaminated.

3.5 LAND USE LAND COVER CLASSIFICATION

The land-use & land cover map of the 10 km radial study area from the periphery of project site has been prepared using Resource SAT-1 (IRS-P6), sensor-LISS-3 having 23.5m spatial resolution and date of pass 28th March 2024 satellite image with reference to Google Earth data. The Land Cover classes and their coverage are summarized in **Table 13.**

TABLE 13: LU/LC AND ITS COVERAGE WITHIN 10 KM RADIUS

LU/LC Classification System				
S.No.	**Level-I**	**Level-II**	**Area (Sq. Km²)**	**Percentage (%)**
1	Built-up land	Settlement	21.55	4.99
		Industrial Settlement	5.12	1.19
		Road Infrastructure	4.19	0.97
		Railway Line	1.16	0.27
2	Agricultural Land/ Crop Land	Single Crop	206.27	47.81
		Double Crop	120.36	27.90
3	Scrubs/Wastelands	Open Scrub	21.68	5.02
		Wasteland	21.44	4.97
4	Waterbodies	River/Nala/Stream/Canal	8.69	2.01
		Dam/Pond/Lake	12.45	2.89
5	Tree Outside Forest (TOF)	Dense (Block) Plantation	3.25	0.75
6	Mines Area	Stone Quarry/Limestone Mines	5.31	1.23
		Total	431.47	100

3.6 SOIL QUALITY

The project site and its terrain consist of flat to moderately steep slopes. The terrain is characterized by forest, agricultural land, land, various settlements, waterbody and open scrub/wasteland. It is also observed that the open scrub area and barren land are dominant in East and North North East Portion of the study area. The 10 Km study area mainly covered by Agriculture Land land which is 77.1 % of the total area. Some of these agricultural fields have also received sediments carried by rainwater run-offs and overflows from the lakes. The following observations are as follows:

Parameters	Unit	Results	Fertility Status
pH	-	6.52 – 7.64	Neutral to Slightly Alkaline
Organic Carbon	%	0.67 – 1.15	Average sufficient to more than sufficient
Nitrogen	Kg/hec	118.32 – 243.82	Good to Better
Phosphorus	Kg/hec	17.34 – 44.27	Less to Medium
Potassium	Kg/hec	259.10 – 343.81	Medium to Better
Sodium Absorption Ratio	-	0.80 – 1.97	Excellent (Little or No Hazard)

3.7 BIOLOGICAL ENVIRONMENT

A primary field survey was carried out within 10 km radius impact zone in and around the ML area to study the floral and faunal diversity of the terrestrial and aquatic environment of the study area. No forest land in the ML area as well as in study area. Details of floristic observation summarized as follows:

Habit	Trees	Shrubs	Herbs	Grasses	Climbers	Epiphytes	Parasites	Total
Core Zone	40	16	8	5	3	0	1	**73**
Buffer Zone	63	38	13	11	9	1	1	**136**

RET STATUS

According to IUCN Status report 2024-1 out of total 136 plant species identified within study area. Among the observed species *Tectona grandis* Linn. (Teak) is Endangered (EN) category. *Aegle marmelos* (L.) and *Swietenia mahagoni* (L.) Jacq. (Indian Mahogany) are Near Threatened (NT) as per IUCN RED list 2024-1. Whereas, remaining species belongs to the Least Concern (LC), Data Deficient (DD) and Not Evaluated (NA), as per latest IUCN status report 2024-1.

Endemic Plants of the Study Area

Among recorded plant species none were assigned the status of endemic plant of this region.

Rare and Endangered fauna of the study area

- **As per IUCN RED (2024-1) list**

The IUCN Red List is the world's most comprehensive inventory of the global conservation status of plant and animal species. It uses a set of criteria to evaluate the extinction risk of thousands of species and subspecies.

Among the reported animals, all are categorized under least concern category as per IUCN list except *Varanus bengalensis* (Bengal monitor) which is Near Threatened.

- **As per Indian Wild Life (Protection) Amendment Act, 2022**

Wild Life (Protection) Amendment Act, 2022, as amended on 20th December 2022, is an Act to provide for the protection of wild animals, birds and plants and for matters connected therewith or ancillary or incidental thereto with a view to ensuring the ecological and environmental security of the country. The Wild life (Protection) Amendment Act, 2022 has come into force since 1st April 2023.

Some of the sighted fauna were given protection by the Indian Wild Life (Protection) Amendment Act, 2022 by including them in different schedule.

Among mammals: Jackal (*Canis aureus*), Common Mongoose (*Herpestes edwardsi*), Indian fox (*Vulpes bengalensis*), are protected in Schedule–I. whereas, Common Langur (*Semnopithecus entellus*), Black-naped hare (*Lepus nigricollis*), Palm squirrel (*Funambulus pinnati*) protected in Schedule-II.

Among the Herpetofauna: Bengal monitor (*Varanus bengalensis*), Indian Cobra (*Naja naja*), and Common Rat Snake (*Ptyas mucosa*) were provided protection as per Schedule-I; While Common Indian Krait (*Bungarus caerulus*), Indian Toad (*Bufo parietalis*) were provided as per Schedule – II of Wildlife protection (Amendment) Act 2022 and as amended.

Among the Avifauna: All of the Avifauna were observed in the study are included in Schedule-II as per wildlife protection (Amendment) Act 2022.

3.8 SOCIO-ECONOMIC ENVIRONMENT

Information on socio-demographic status and the trends of the communities in the 10 km radius was collected through primary social survey and secondary data collection from Census data, Govt. Portals, administrative offices and various departments. Details regarding education and infrastructure facilities 2011 are presented in **Table 16(A),** Predicted population details in study area (2020) are given in **Table 16(B)** & Summary of the socio-economic status of the study area is given in **Table 14,** respectively.

TABLE 14(A): SUMMARY OF SOCIO-ECONOMIC ENVIRONMENT OF VILLAGES WITHIN 10 KM RADIUS AREA

Total households	19621
Total population	93819
Male Population	46995
Female population	46825
SC Population	22151
ST Population	6825
Total literates	57379
Total Illiterates	36440
Total workers	46290
Total main workers	34068
Total marginal workers	12233
Total non-workers	47525

Source: *Primary census abstract 2011, District Durg & Raipur, State Chhattisgarh.*

TABLE 14(B): PREDICTED POPULATION DETAILS IN STUDY AREA (2020)

Zones	Total Population	Total Male	Total Female
0-2 km	13108	6482	6626
2-5km	30284	15168	15116
5-10km	**68596**	**34398**	**34198**
10 km	111988	56048	55940
In %		**50.05**	**49.95**

Source: *GeoIQ website (https://geoiq.io/places/Chhattisgarh/zibvgpcXAF)*

TABLE 15: IN PERCENTAGE DETAILS REGARDING INFRASTRUCTURE FACILITIES WITHIN 10 KM RADIUS STUDY AREA

Infrastructure facilities	**Availability (In percentage) As per year 2011, Census District – Durg, Chhattisgarh**
Educational Facilities	100
Drinking water	100
Road	100
Power	100
Communication	84.09
Transportation	100
Govt. PHC & SC	48.5
Bank & Society	25.45
Drainage	55.73
Recreation	92.64

Source: *Primary census abstract 2011, District Durg & Raipur, State Chhattisgarh.*

4.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.1 LAND ENVIRONMENT

4.1.1 Impact on topography, drainage pattern and land use

The topography of the mine lease area altered due to on-going mining activity and it will be altered further due to the proposed expansion of mining operations as per the approved mining plan. During plan period mine pits and surface dumps are will be developed within the mine lease area.

The lease area represents undulating plain with average elevation ranging between 265.0 mRL to 281 mRL. The regional land slope is towards north that is towards river Shivnath located about 3.0 km to the north of study area. There is no perennial surface water stream or nallah or any kind of water bodies are in existence within mine lease area. However, one season nala is passing adjoining the ML area. Storm water run-off/ drainage of the study area are simple in nature and during rainy season controlled by seasonal 1st order streams which are joining to River Shivnath. There is no forest land involved in the mine lease as well as in study area.

4.1.2 Impact on soil quality

Surface run-off during rainy days flows along the slopes and joins seasonal streams/Nala flowing outside the mine lease area. As there is neither a toxic effluent nor solid waste from the mines, quality of soil is not expected to be adversely effected.

Initially, as a part of developmental activities, from the soil bearing areas, soil would be dozed and would be concurrently used for developing plantation along the roads, lease periphery and also temporarily stacked in the designated soil dump area within the lease area.

Mitigation Measures:

- Retaining wall constructed along seasonal nala which is flowing adjacent to the mine lease to check soil erosion during monsoon period.
- Special initiative has been taken up for top soil conservation and over burden dump stabilization. Overburden dump of limestone mines has been vegetated by covering with topsoil and tree plantation.

Development of thick plantation using native species on inactive surface dumps, and on safety barrier zone left along the mine lease boundary to act as soil binders and control soil erosion.

4.2 AIR ENVIRONMENT

4.2.1 Impact on Air Environment

The mathematical Model AERMOD was used for predicting the GLCs, which is entirely in line with the requirement of Central Pollution Control Board, New Delhi. In 1991, the U.S. Environmental Protection Agency (EPA) in conjunction with the American Meteorological Society (AMS) formed the AERMOD. AERMOD is a steady-state plume model aimed at short-range (up to 50 km) dispersion from stationary industrial-type sources.

4.2.2 Model Prediction

The model simulations are done for the air pollutants mainly particulate matter emitted directly from mining operations and vehicles. Impact on the ambient air quality of study area is assessed and predicted results are presented in **Table 16.**

TABLE 16: PREDICTED INCREMENTAL GROUND LEVEL CONCENTRATIONS

Sr. No.	Parameter	Worst Case Scenario – No control measure is implemented – GLC ($\mu g/m^3$)	Controlled Scenario – Implementation of practicable mitigation measures – GLC ($\mu g/m^3$)
1	Particulate Matter (PM_{10})	26.5	6.62
2	Particulate Matter ($PM_{2.5}$)	8.66	2.55

4.2.3 Impact due to transportation of Limestone from ML-II to in situ ML-I Crusher –

Scenario – 1

1.35 MTPA limestone after expansion will be transported to crusher located at ML-I through road (considering 300 working days). Thus, around **225 trucks per day i.e., 450 trips per day** will be required to transport the materials by road with the capacity of each truck 20 Tons is being considered. This is temporary in nature till the closed pipe conveyor gets commissioned.

The company will explore all possibilities for using Battery operated, LNG, CNG based vehicles for transportation of the raw material. By using such transport vehicle, there will be minimum impact due to expansion on the road transportation.

The emission of CO, HC, NOx and PM from the trucks has been calculated for the proposed expansion project, based on the emission factor in gm/km of Trucks / Trailer / Bus (Source: Central Pollution Control Board) provided in **Table 17.**

TABLE 17: DAILY EMISSION FOR TRUCKS

Parameters	CO gm/km-hr	HC gm/km-hr	NOx gm/km-hr	PM gm/kw-hr
Total Emissions for 450 trips/day (in gm/km)	675	432	1575	9

Scenario – 2

The total length of pipe conveyor belt is 5.5 km. Out of 5.5 km, 3.0 km from crusher towards integrated cement plant through pipe conveyor belt, the company will create a (an intermediary location) stockyard of limited inventory to function the plant. Remaining distance which is 2.5 km will be covered through dumper for raw material transport till the land license agreement done with BSP. Hence, it will reduce the road transportation distance. Pipe conveyor belt will be commissioned after the land license agreement. (The total length of closed pipe conveyor is 5.5 Km our of which 92% i.e. 5.090 KM has been already completed).

Thus, with the working of closed pipe conveyor, 100 percent limestone will be transported though closed pipe conveyor instead of trucks. Hence, the line source emissions will be significantly reduced. Subsequently, the existing traffic load or PCU of Ahiwara - Berla Road will be reduced further and Level of Service (LoS) will became excellent category.

4.2.3 Additional Measures to reduce/control pollution control

To minimize the impact of pollutant concentration especially particulate matter, the following control measure should be adopted by the project proponent.

- ✓ Controlled transportation, Wet drilling and blasting
- ✓ Water spray on haul roads to avoid dust generation during transportation.
- ✓ Water spray at truck loading and un-loading of materials
- ✓ Covering of material when transport through trucks/dumper

Adoption scientific mining methods to reduce dust emission from point and line source

Scientific methods of mining and pollution control systems are being adopted in the mine to control dust emissions from point and line sources, as follows:

Point Source: *These includes drilling, blasting, loading, unloading, sizing and grading activities*

- Use of wet drilling/ drills with dust arrestors to control dust generation during drilling activities
- Blasting shall be carried out during period when all other activities are halted.
- Blasting to be avoided during high winds and overcast conditions.
- Delay blasting technique shall be used.
- Avoiding secondary blasting by use of rock breakers.
- Water sprinkling on blasted material before loading.
- The drop height during loading and unloading shall be maintained just above the truck height.
- Trucks shall not be over loaded.
- Strict speed limits shall be imposed on trucks/vehicles.
- Provision of fixed water sprinkling arrangement at crusher.

Line Source: *These includes Haul roads & approach roads –*

- Development of plantation along approach road.
- Periodic maintenance of tippers/dumpers used for OB & Mineral transport.
- Periodic maintenance of haul roads
- Regular water sprinkling on haul roads.

4.3 NOISE IMPACTS

Noise is mainly generated during various mining operations, loading and transport activities. Day and night sound pressure levels are often used to describe the community exposure. The nearest human settlement (Hardi) is 0.6 km away from mine site, the ambient noise level at day and night time is 54.1 dB(A) and 47.9 dB(A) respectively. The resultant noise level at commercial location of this village is 63.8 dB(A) & 52.1 dB(A) at day & night respectively.

4.3.1 Impacts due to Ground Vibration and Fly Rocks

The major source of ground vibration from this mine is blasting, however controlled blasting activity is being/will be carried out. The major impact of the ground vibrations is on the domestic houses located in the villages surrounding the mine lease area. The kuchha houses are more prone to cracks and damage due to the vibrations. Apart from this, the ground vibrations may develop a fear factor in the nearby settlements.

Another impact due to blasting activities is fly rocks. These may effect on the houses nearby the mining lease area and may cause injury to persons. Nearest major habitation from the mine lease area is Hardi village located at 0.33 km in North direction. Based on calculations, it reveals that there will be insignificant impacts of drilling and blasting in the surroundings area since blast design parameters trial blasting is done so as to optimize charge per hole, spacing and burden. To control ground vibration and fly rocks use of latest blasting techniques such as in-hole initiation system, use of Raydet, MSDD is done which ultimately control ground vibration to bear minimum. Similarly, as per requirement muffle blast is also done wherever, required.

Mitigation Measures

- Standard specified mining equipment is being used and the equipment will be in good working conditions, properly lubricated and maintained to keep noise within permissible limits.
- Drilling is being carried out with sharp drill bits which help in reducing noise and same will be continued.
- Controlled blasting with proper spacing and optimum charge/delay will be maintained.
- Tall trees with heavy foliage are being/will be planted along the boundary of mining lease area which will act as a natural barrier to propagating noise.
- Regular noise monitoring is being/will be carried at project site to check compliance with prevailing rules.
- Personal Protective Equipment's (PPEs) like ear plugs/ear muffs are provided.

4.4 IMPACT ON WATER ENVIRONMENT

4.4.1 Impact on groundwater regime/streams / lake / springs due to mining

In the mining lease area, there is no stream or nallah or any other kind of water bodies are in existence. A couple of 1st order seasonal streams are adjacent to ML area which meets to Sivnath river which forms the major drainage system in the area.

The run-off may carry soil and silt from the broken-up area in the mine to the seasonal nallas adjacent to lease area which is being arrested by retaining wall developed by M/s. JKLCL to restrict the soil and silt from entering into water bodies in surrounding area.

4.4. 2 Waste water generation & management plan

There is no process effluent generation in the JKCL Limestone mine. There will be no workshop as well as mineral beneficiation activities (only crushing of limestone at ML-I). Hence, there is no tailings, process or workshop effluent generation in the mine lease. Domestic effluent is generated from mines office is being treated in septic tank followed by soak pit. Hence, there is no impact envisaged due to the effluent generation on surface or ground water quality in the area

Mitigating Measures

- Construction of bunds and contour trenches at strategic location at the undulated slopes to reduce flow of run-off water and control soil erosion.
- Construction of garland drains around the mine pit to divert surface run-off away from the mining area.
- Retaining wall constructed along the seasonal drain & Garland drain made all around the lease periphery
- Collection of rain water in mine sumps and use of accumulated water in dust suppression and plantation in the mine lease area.

4.5 IMPACT ON BIOLOGICAL ENVIRONMENT

The details of impact and mitigation measures in respect of biological environment are as under:

S. No.	Project Aspects / Activities	Impacts	Mitigation Measures Suggested
1.	Site Preparation (Removal of Vegetation)	At present only 3.91 Ha. area is only excavated whereas total 154.45 Ha. will be excavated at the end of life of mine. The predominant local tree species like *Acacia nilotica* (Babool), *Acacia catechu* (Khair), *Acacia leucophloea* (Hivar) and *Butia monosperma* (Palash) along	The existing plantation developed by M/s. JKLCL at Captive Limestone Mine is (i.e. ML- I & ML-II) is about 46392 nos. whereas plantation outside lease area is 148806 nos. Thus, total plantation is 195198 Nos. This plantation will further enhance in current plan period with additional plantation of 13625 Nos (1125

S. No.	Project Aspects / Activities	Impacts	Mitigation Measures Suggested
		with under tree like *Prosopis juliflora and Shrubs* will be cleared during mining activities. Thus, loss of local biodiversity will be affected.	Nos. in ML area and 12500 in outside ML area) These positive steps will to help provide breeding and nesting grounds for various birds, thereby enhancing biodiversity in the area.
2.	Dust emission due to ML-I mining activities (Drilling, Blasting Loading/ unloading, material handling and transfer)	As per predicted GLC through AERMOD Model, the calculated maximum GLC is (26.5 □g/m^3) during uncontrolled condition. Thus, dust deposition on vegetation agriculture land around periphery of ML area. Thus, decline the rate of photosynthesis of surrounding vegetation in a scale of 3 out of 5 specifically within 1 km from mine lease area	A thick green belt will be developed around the entire contiguous safety zone of the mine leases, with plantations in undisturbed areas, on benches of mined-out areas, waste dump areas, and other locations using native floral species. Transportation of limestone will be conducted through covered trucks wherein in future it will be through closed pipe conveyor. Water sprinkling will be carried out at loading and unloading points, as well as regularly within the mining area and on haulage roads. The waste material and overburden (OB) dumps will be covered with shrubs and grass plantations.
3.	Invasion of Wild Animals at Night	Possibility of wild animal injury/ deaths as a result of collisions/ Accident in mining area.	No forest within the study area. No mining operations will be conducted at night. The fencing, and greenbelt will be developed around the ML area which acts as a barrier and restrict the entry of stray wild animals.
4.	Conservation Measures to maintain local bird diversity within mining areas.	Scarcity of food and water for local birds during summer season	It is recommended to install artificial nesting boxes, bird feeders, and hanging earthen pots or dishes filled with water during the summer season. These positive steps help provide breeding and nesting grounds for various birds, thereby enhancing biodiversity in the area.

4.6 IMPACT ON SOCIO-ECONOMIC ENVIRONMENT

A comprehensive Needs Assessment Study was conducted in the vicinity of M/s. JK Lakshmi Cement Ltd. The details of impact studies in respect of Socio-economic environment are as under:

4.6.1 Positive impacts

- Benefits to the economy of district and also state, contributing to development of area.
- Generation of more job opportunities to local youth.
- Apart from direct employment, there will be creation of indirect employment through the local community establishing small shops like tea stalls, supply of intermediate raw materials, repair outlets, hardware stores garages etc.
- Improvement in quality of life due to stable income source.
- Improvement in green cover due to the plantation of trees in the Study area, also are leading to a decrease in environmental pollution.

- Improvement in social and infrastructural development by the industries as a part of CER and EMP.

4.6.2 Negative impacts

- In absence of site specific mitigation measures, there will be dust deposition on agricultural fields in Semariya, Ghikuria, Nandini Khundini, and Hardi may affect crop yield and soil quality, impacting the livelihood of farmers in the region.
- Alteration of groundwater flow and reduction in groundwater quality and decline in groundwater levels due to mine dewatering.
- High noise levels from blasting, drilling, and the operation of heavy machinery disturb daily life and increase stress among residents in the villages in study area.
- Increasing Production of limestone capacity can cause heavy vehicle movement lead to dispersed dust particles which affects the health of the workers and Local Peoples. Trucks, tankers and other vehicles may cause additional air pollution to the surrounding areas. The effects may be more prominent in nearby villages. And also it increases chances of road accidents.
- Possibilities of Hazards and accident which may cause harm to the workers working or loss of life of the workers.
- If influx of workers from outside areas then there may an increased pressure on residential accommodation the neighbourhood.

Mitigation Measures

In order to mitigate the adverse impact likely to arise in social, cultural and economic aspects in the surrounding region due to the proposed project and improvement in quality-of-life following mitigation measures should be adopted:

- Implementation of dust suppression techniques, such as water spraying and the use of dust suppressants, to minimize air pollution.
- Installation of noise barriers in the form of thick plantation and the use of low-noise equipment to reduce noise pollution.
- A comprehensive land reclamation and rehabilitation plan to restore mined areas and mitigate land degradation.
- Regular consultations with local communities to address their concerns and involve them in decision-making processes.
- Ensure that roads are properly signed, vehicles are well maintained and drivers are well trained and safety conscious.
- Worker should be trained with all safety equipment. All health and safety measures should be adopted by the company to ensure the safety of the workers and the surrounding society.
- Project proponent should take appropriate steps to keep environment clean and Green belts development/ Plantation along with the internal Road.
- Rain Water Harvesting should be implemented
- Social infrastructure development activities should be proposed by the company.

5.0 ANALYSIS OF ALTERNATIVES (SITE AND TECHNOLOGY)

5.1 SITE SELECTION

The mining project is site-specific; thus, no alternate sites were considered.

5.2 SELECTION OF ALTERNATIVE TECHNOLOGY

Mining of limestone is being carried out by fully mechanized open cast method in line with EC granted from MoEFCC, New Delhi for existing mining operation and therefore it will be continuing for proposed expansion of production capacity project. Hence, no alternative mining technologies are considered for this project.

6.0 ENVIRONMENTAL MONITORING PROGRAM

Environment Management Department along with a well-equipped laboratory is already functional at M/s. JK Lakshmi Cement Limited, Durg for its operational existing mining operation. The department is having qualified Mine Head, Environmental Officer and experienced chemists/ staff for the environmental laboratory to cater the routine monitoring requirement and the same will be extended for the proposed expansion of captive mine.

7.0 ADDITIONAL STUDIES

7.1 PUBLIC CONSULTATION

The Draft EIA-EMP report for expansion activities of M/s. JK Lakshmi Cement Ltd. is prepared as per the TOR issued by EAC (Non Coal) and the report is submitted for public consultation process as per the provisions of EIA Notification 2006 and amendments thereof.

After completing the public consultation process, the points raised and commitment of project proponent during the public hearing will be incorporated in the final EIA-EMP report for final submission to Environmental Clearance.

7.2 RISK ASSESSMENT & DISASTER MANAGEMENT PLAN

The assessment of risk in the proposed expansion project has been estimated for explosives handling, movement of Trucks/Tippers, Dust hazards, Hazards, shock hazards, etc. and corresponding mitigation measures are suggested in the EIA/EMP report.

Hazard analysis involves the identification and quantification of the various hazards (unsafe conditions) that exist in the mining operation. On the other hand, risk analysis deals with the identification and quantification of risks occurring due to the plant equipment and personnel exposed, due to accident resulting from the hazards in the plant. The occupational and safety hazards and preventive measures, process hazards and their preventive measures are provided in details in Chapter 7 of the EIA report.

The main objective of the risk assessment study is to determine damage due to major hazards having damage potential to life and property and provide a scientific basis to assess safety level of the facility. The secondary objective is to identify major risk in mining operation, occupation and provide control through assessment and also to prepare on-site, off site plans to control hazards.

8.0 PROJECT BENEFITS

Proposed Social Welfare Arrangement

M/s. JK Lakshmi Cement Ltd. support social welfare activities under CSR obligation under companies act.

Due to proposed expansion of JKLCL and additional employment opportunities, additional infrastructure facilities, development in ancillary business, etc., quality of life will improve in the study area. CSR scheme as per project specific requirement will be implemented, sufficient budgetary provision will be made available as mentioned. Local bodies will be consulted to suit their needs and CSR schemes will be implemented. With this there will be enhanced economic activities and locals will be benefitted. M/s JKLCL as per CSR policy is being and will carry community welfare activities in the following areas:

- Community development
- Health & medical care
- Roads
- Livelihood Intervention
- Education
- Drainage and sanitation
- Drinking water supply occasionally in the event of water scarcity through tankers, etc.
- Rural Development

The project benefits business growth: Transporters and other service providers such as Engineers; Designers; Process Maintenance consultants; Chartered accountant; Electrical contractors; Fire Fighting system designers; Pollution Control System consultants etc. will get long term business opportunity in the plant.

9.0 ENVIRONMENTAL MANAGEMENT PLAN

An Environmental Management Plan comprising following set of mitigation, management, monitoring and institutional measures to be taken during implementation and operation of the project, to eliminate adverse environmental impacts or reduce them to acceptable levels.

- Overall conservation of environment.
- Ensure effective operation of all control measures.
- Monitoring of cumulative and longtime impacts.
- Control of waste generation and pollution.
- Adoption of suitable pollution control measures in the mines
- Adoption of safe working practices
- A greenbelt of appropriate width will be developed around the periphery of ML area
- Development of greenbelt with locally available species is of prime importance to reduce noise and air pollution impacts by attenuation / assimilation and for providing food and habitat for local macro and micro fauna. This not only overcomes the problem but also enhances the beauty of area that will attract bird and insect species and by this way ecology of the area will be maintained to a great extent.

The Capital cost of mining project is **Rs. 53 Cr. (i.e. Rs. 5300 Lakhs)**. The cost of EMP is of Rs. **1058.5 Lakhs** (Existing Capital Cost of EMP Rs. **530.8 Lakhs +** Additional Capital Cost of EMP **Rs. 527.7 Lakhs)** and total recurring cost per annum is of **Rs. 55.05 Lakhs** towards environmental measures viz dust suppression, water pollution control, greenbelt development, OH & S, environmental monitoring, etc.

10.0 CONCLUSION

The proposed expansion project of M/s. JK Lakshmi Cement Ltd. (ML-II) Limestone Mine (Lease area: 252.105 Ha) will be beneficial for the development of the nearby villages in terms of enhancement of livelihood, employment and revenue generation which eventually gives a boost to

the regional growth and industrialization. Further improvement in infrastructure will take place like education, roads, availability of drinking water, medical facilities and growth of allied in adjacent villages. Some environmental aspects like dust emission, noise, siltation due to surface run-off, etc. will have to be controlled within the permissible norms to avoid impacts on the surrounding environment by implementation of site specific Environmental Management Plan. Necessary pollution control equipment like water sprinkling, plantation, personal protective equipment's, etc., will form regular practice in the project. At present transportation of Limestone from Captive Limestone Mine of M/s. JKLCL is being done through covered Trucks. As construction work of closed pipe conveyor is not completed due to nearly 372 mtr piece of land is still to be acquired from SAIL + BSP. (Total length of closed pipe conveyor is 5.5 Km our of which 92% i.e 5.090 KM has been already completed). Thus, with the working of closed pipe conveyor, 100 percent limestone will be transported though closed pipe conveyor instead of trucks. Hence, the line source emissions will be significantly reduced. Subsequently, the existing traffic load or PCU of Ahiwara - Berla Road will be reduced further and Level of Service (LoS) will became excellent category.

Additional pollution control measures and environmental conservation measures will be adopted to control/minimize impacts on the environment and socio-economic environment of the area. Measures like development of thick green belt and plantation within mine lease area as well as outside ML area and along transport road, adoption of rainwater harvesting in the mine and in nearby villages, etc. will be implemented. The CSR measures to be adopted by the mine management will improve the social, economic status of the nearby villages. The overall impacts of the proposed expansion of captive limestone mine will be positive and will result in overall socio-economic growth of nearby villages.

Thus, it can be concluded that with the judicious and proper implementation of the pollution control and mitigation measures, the project will not add adverse pollution levels to the environment, moreover, it will be beneficial to the society and will help to reduce the demand-supply gap of cement to some extent and will contribute to the economic development of the region and thereby the country

11.0 DISCLOSURE OF CONSULTANTS

The Environmental studies for proposed expansion project of M/s. JK Lakshmi Cement Limited (JKLCL) ML-1 have been carried out by M/s. Anacon Laboratories Pvt. Ltd., Nagpur (M/s. ALPL). Anacon established in 1993 as an analytical testing laboratory and now a leading Environmental Consultancy company backed by testing lab for environment and food in Central India region. M/s. ALPL is a group of experienced former Scientists from the Government Institutions and excellent young scientist of brilliant career with subject expertise. It is recognized by Ministry of Environment & Forests, New Delhi for carrying out environmental Studies & accredited by Quality Council of India (QCI) for conducting Environmental studies having Accreditation Certificate No.: **NABET/EIA/23-26/RA 0304_Rev. 01** dtd. 13 March, 2024 valid till Sept 29, 2026.