PRE – FEASIBILITY REPORT

INDEX

1.0EXECUTIVE SUMMARY

1.1 EXECUTIVE SUMMARY

Pagara-Jhiriya Limestone Mine of Dalmia Cement (Bharat) Ltd. (ML Area – 395.965 ha., ROM 2.41 Million TPA) is located in Villages – Pagra, Jhiriya Kothar, Jhiriya Bajpain & Jhiriya Koparihan, Tehsil – Amarpatan, District – Satna, Madhya Pradesh. The limestone mine was initially sanctioned prospecting license for 2 years period vide state government order no. F-2-74/09/12/1 Bhopal Dated- 22.05.2010 over an area of 735.296 ha. The prospecting license deed was executed on 08.06.2010 for two year period w.e.f. 08.06.2010 to 07.06.2012. The applied area is part of area held under prospecting license.

The applicant applied for grant of mining lease over 461.806 ha. mineralized area out of total 735.296 ha area granted under PL vide application dated 29.03.2012. The State Government of Madhya Pradesh has taken decision to grant precise area under mining lease and communicated such decision vide letter No. F-3-08/2013/12/1 Bhopal, Dated-24.01.2014over 395.965 ha. after excluding prohibited area.

This Mining Plan has been approved vide letter no. MP/Satna/Limestone/MPLN/G-03/14-15/5208, Jabalpur dated 29.09.2014 **(Annexure-I)** under Rule-22(4) of M.C.R. 1960.

The Limestone mined out from the applied area will be used in the proposed Cement plant of the lessee in Satna district, MP.

The proposed capacity of the plant is 4.0million TPA of Cement. The part requirement of Limestone i.e. 1.5 million TPA will be met from Pagara-Jhiriya Limestone mine when it will be fully developed.

1.1 SALIENT FEATURES OF THE PROJECT

Particulars	Details
Latitude	24°26' 41.5" N to 24° 28' 18.30" N
Longitude	81° 09' 42.60" E to 81° 12' 27.60" E
Toposheet No.	63 H/3
Total Mine Lease area	395.965 hectare
Probable Mineral Reserves	45.99 Million Tonnes
Production	Proposed capacity (ROM): 2.41 MTPA (Limestone:1.5 MTPA, Soil: 0.56 MTPA (348000 cum) and OB: 0.35 MTPA (176000 cum))
Life of Mine	34 Years
Estimated project cost	Rs. 100 million

<table>
<tr><td></td><td>Additionally, Land cost Rs. 1000 million, Environmental protection Rs. 0.20 million and occupation health & safety Rs. 0.10 million is also envisaged for implementation of the proposed project.</td></tr>
<tr><td>Man Power</td><td>66 Persons</td></tr>
<tr><td>Elevation</td><td>Highest – 329 MSL; Lowest – 319 MSL</td></tr>
<tr><td>Land use</td><td><table>
<tr><th>S. No.</th><th>Land Use</th><th>Area (Ha.).</th></tr>
<tr><td>1.</td><td>Agriculture Land</td><td>370.965</td></tr>
<tr><td>2.</td><td>Barren land</td><td>25.0</td></tr>
<tr><td colspan="2">Total</td><td>395.965</td></tr>
</table></td></tr>
<tr><td>Nearest habitation/ town</td><td>Pagara Village adjacent to lease towards W</td></tr>
<tr><td>Nearest Airport</td><td>Satna Airport≈ 32 km NW
Chorhata Airstrip, Rewa≈5 km, NE
Khajuraho airport≈ 130 km, NW</td></tr>
<tr><td>Nearest Highway</td><td>NH – 7 ~ 2.20 Km, NW</td></tr>
<tr><td>Nearest railway track from mine boundary</td><td>Rewa ~ 10.10 Km, NE</td></tr>
<tr><td>Power supply</td><td>Electricity will be supplied from Madhya Pradesh Madhya Kshetra Vidyut Vitaran Company Limited (MPMKVVCL).</td></tr>
<tr><td>Nearest Telephone</td><td>Pagara village adjacent to lease area</td></tr>
<tr><td>Nearest Educational facility
Dispensary and Govt. Hospital</td><td><table>
<tr><th>Name</th><th>Distance(Km)
(From Lease Boundary)</th><th>Direction</th></tr>
<tr><td colspan="3">Education</td></tr>
<tr><td>Maharaja Public School</td><td>Bela</td><td>2.60 km, NNE</td></tr>
<tr><td>Gurukul Eng. Mid. School</td><td>Babupur</td><td>5.45 Km, NE</td></tr>
<tr><td>Delhi Public School</td><td>Rewa</td><td>12.90 Km, NE</td></tr>
<tr><td colspan="3">Hospitals</td></tr>
<tr><td>Vindhya Hospital And Research Centre</td><td>Rewa</td><td>12.60 Km, NE</td></tr>
<tr><td>Kushabhau Thakrey District Hospital</td><td>Rewa</td><td>12.15 Km, ENE</td></tr>
</table>
(Source: All distances are taken with respect to Google Earth).</td></tr>
<tr><td>Water demand and supply</td><td>75 KLD and will be met from ground water or local authorities</td></tr>
<tr><td>Nearest tourist places</td><td>None within study area</td></tr>
<tr><td>Defense installations</td><td>None within study area</td></tr>
<tr><td>Archeological Features</td><td>None within study area</td></tr>
<tr><td>Ecological sensitive zones</td><td>None within study area</td></tr>
<tr><td>Nearest Forests</td><td><table>
<tr><th>S. No.</th><th>Forests</th><th>Distance (Km)
(From Lease Boundary)</th><th>Direction</th></tr>
</table></td></tr>
</table>

<table>
<tr><td></td><td>
<table>
<tr><td>1.</td><td>Mand RF</td><td>4.15</td><td>SE</td></tr>
</table>
(Source: All distances are taken with respect to S.O.I. GT Sheet.)
</td></tr>
<tr><td>Nearest streams/ rivers/ water bodies (from mine boundary)</td><td>
<table>
<tr><th>S. No.</th><th>Water Bodies</th><th>Distance (Km) (From Lease Boundary)</th><th>Direction</th></tr>
<tr><td>1.</td><td>Talab, Kakalpur</td><td>0.75</td><td>S</td></tr>
<tr><td>2.</td><td>Water Reservoir, Mukundpur</td><td>6.3</td><td>SE</td></tr>
<tr><td>3</td><td>Canal</td><td>4</td><td>SE</td></tr>
<tr><td>4.</td><td>Bihar River</td><td>4.15</td><td>SE</td></tr>
</table>
(Source: All distances are taken with respect to S.O.I. GT Sheet.)
</td></tr>
<tr><td>Seismic zone</td><td>According to BMTPC's vulnerability atlas, II edition, the area falls in a region of low damage risk zone, seismic zone – II.</td></tr>
</table>

1.2 PROPOSED PLANNING

Mining Method: Open Cast Method

Project Cost : Rs. 100 million

Additionally, Land cost Rs. 1000 million, Environmental protection Rs. 0.20 million and occupation health & safety Rs. 0.10 million is also envisaged for implementation of the proposed project.

Production : Proposed capacity (ROM): 2.41 MTPA (Limestone:1.5 MTPA, Soil: 0.56 MTPA (348000 cum) and OB: 0.35 MTPA (176000 cum))

Table 1: Land Use of lease area

S. No.	Particulars	Present Land Use (ha.)	At the end of 5th year (ha.)	At the end of life of Mine (ha.)
1.	Pit area	2.50	30.30	239.0 (Water Reservoir = 100 Ha. & Plantation = 139 Ha.)
2.	Dump Area Stack (Sub grade)	-	8.85	-
3.	Road	1.0	1.0	1.0 (Public Use)
4.	Infrastructure	-	1.0	-
5.	Plantation	6.0	8.50	135.965 (Plantation)
6.	Protection Bunds and Drains	-	2.75	-
7.	Un-disturbed area	386.465	343.565	20
Total		**395.965**	**395.965**	**395.965**

2.0 INTRODUCTION OF THE PROJECT/ BACKGROUND INFORMATION

2.1 IDENTIFICATION OF PROJECT AND PROJECT PROPONENT

PROJECT: Dalmia Cement (Bharat) Ltd. (DCBL) envisages to set up a Cement Plant in Satna District, Madhya Pradesh**.**

Limestone, the principle raw material for cement manufacturing, is proposed to be met from the Mining Lease extending over an area of 395.965 Ha located in Villages – Pagra, Jhiriya Kothar, Jhiriya Bajpain & Jhiriya Koparihan, Tehsil – Amarpatan, District – Satna, Madhya Pradesh. DCBL has been granted Mining Lease by Govt. of Madhya Pradesh (MP) vide its letter no F-3-8/2013/12-1 dated 20.03.2015 (Enclosed as **Annexure- II**). The Mining Lease was executed on 27.07.2015 and registered on 06.11.2015(Enclosed as **Annexure-III**). Mining Plan of the proposed Mine has been approved by Indian Bureau of Mines vide letter no MP/SATNA/Limestone/MPLN/G-03/14-15/5208 dated 29/09/2014.

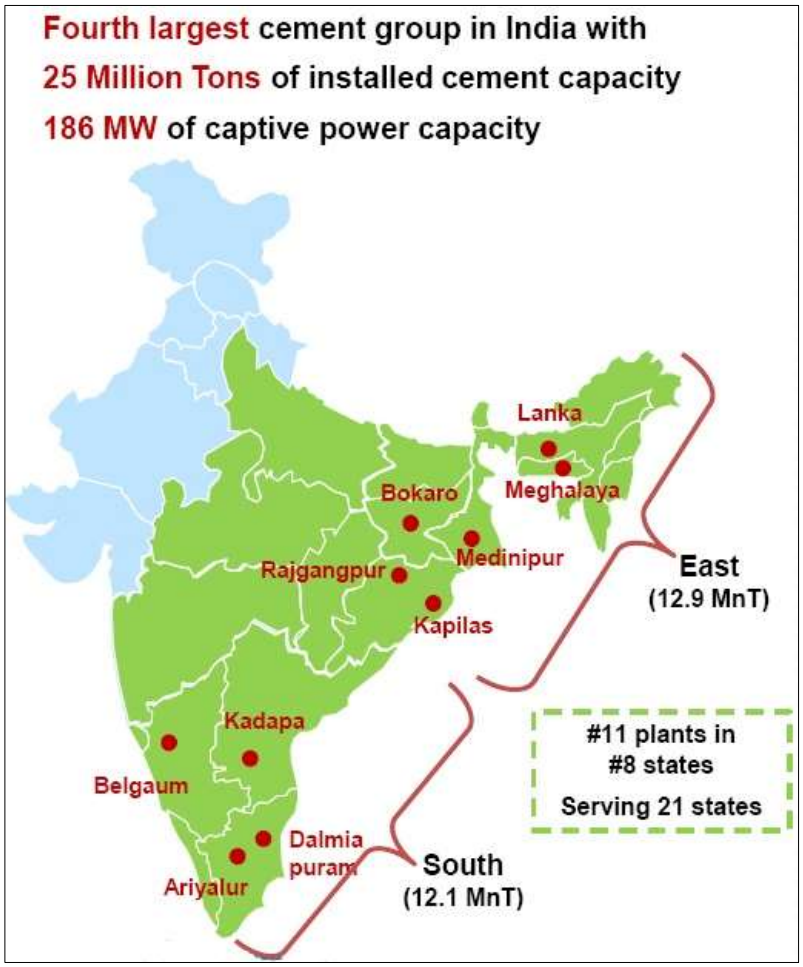
The present proposal is for obtaining Environmental Clearance for 2.41 MTPA ROM from Ministry of Environment, Forests & Climate Change (MoEF&CC) under 1(a), I category of EIA notification SO1533 dated 14th Sep. 2006 and subsequent amendments.

PROJECT PROPONENT: Dalmia Cement is one of the leading cement producers of India. The group was founded in 1935 by Shri Jaidayal Dalmia. First Cement Plant of DCBL was established in 1939 at Dalmiapuram, Tamil Nadu, thus enjoying a heritage of over 77 Years of expertise and experience. Dalmia is a multi-spectrum Cement player and a pioneer in super specialty cements used for Oil wells, Railway sleepers and Air strips. Dalmia Cement was among the first to adopt and incrementally raise the bar on green production norms. In 1974, Dalmia revolutionized the railways by pioneering the use of cement sleepers instead of wooden sleepers.

DCBL has been at the forefront of pioneering and introducing many new technologies in the cement manufacturing, which exist today, which are followed by others in the industry. DCBL has been and continues to be an industry leader in the niche market segments. DCBL prides itself on having been at the forefront of pioneering and introducing many new technologies, which exist today, which are followed by others in the industry which improves the quality and quantity of products and reduces the pollution load.

The Group, guided with its vision statement, has initiated commendable actions in order to achieve its objectives

The Group currently has cement plants in Tamil Nadu (Dalmiapuram & Ariyalur), Andhra Pradesh (Kadapa), and Meghalaya (Thangskai) Karnataka (Belgaum), Jharkhand (Bokaro), Assam (Umrangso& Lanka), Odisha (Rajgangpur & Kapilas) and West Bangal (Midnapur). The Group now controls a cement capacity of about 25 Million Tonnes& has a strong presence in Southern, Eastern & North East Regions of the Country. DCBL has the pride as the first company in the country to secure the maximum numbers of limestone through auctions i.e. at Chittaurgarh, Rajasthan, Kotameta, Orissa and Kesala II, Chattisgarh.


Fourth largest cement group in India with
25 Million Tons of installed cement capacity
186 MW of captive power capacity
Lanka
Meghalaya
Bokaro
Medinipur
Rajgangpur
Kapilas
East
(12.9 MnT)
Kadapa
Belgaum
Dalmia puram
Ariyalur
South
(12.1 MnT)
#11 plants in
#8 states
Serving 21 states

Vision Statement

*"To be a **Leader** in Building Materials that **evokes Pride** in all stakeholders through **Customer Centricity**, **Innovation**, **Sustainability** & our **Values."***

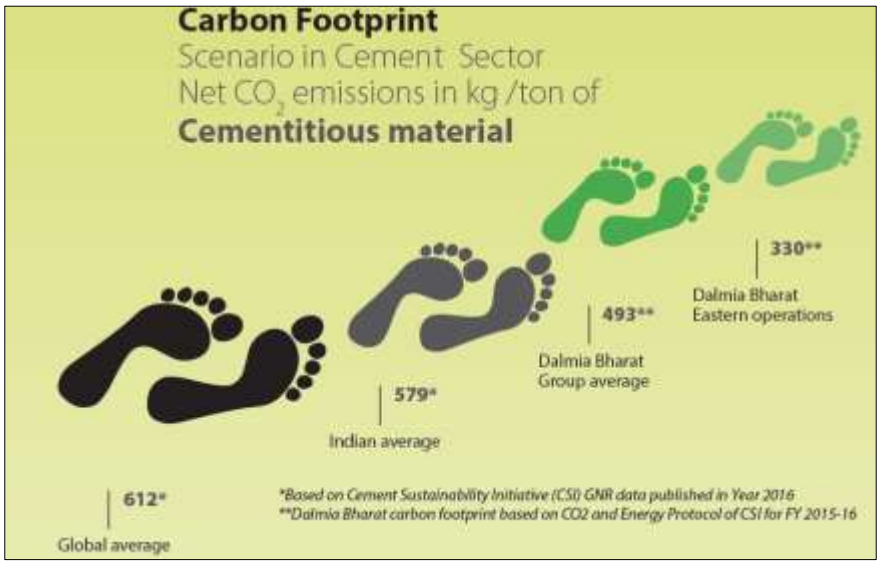
DCBL has established a number of objectives and targets on concerns at global and regional levels around which it focuses its programmes, delivery and evaluates its performance. Additionally, Dalmia Cement is actively involved with other global and domestic task forces on sustainable development. Some of the initiatives are listed hereunder:-

- Dalmia Cement is a member of CSI (Cement Sustainability Initiative, under the aegis of the WBCSD, Geneva). Consequently, it is bound by the CSI's Charter on Sustainability. We adhere to the exacting and very comprehensive standards of the CSI.

- Dalmia Cement (Bharat) Ltd. is the first company in the cement sector to achieve GREENPRO certification for Portland pozzolana cement from CII.

- Dalmia is in partnership with Global Alliance "EP 100" for energy productivity. Dalmia Cement committed to double their energy productivity by 2030 from a baseline year of 2010-11
- Dalmia is also in partnership with CDP " RE 100" for shift towards renewable energy commitment

- The Group has target towards **Water Neutrality by 2018.**
- The Group CEO represented India at High Level Signing Ceremony of Paris Agreement Climate Change. He was special invitee of Secretary –General of United Nations.
- Dalmia achieved lowest carbon footprint in comparison of global average and Indian average (based on Cement Sustainability Initiative (CSI) GNR data published in Year 2016).



- The initiatives of Dalmia towards sustainability, manufacturing and social commitments at various locations, have also been appraised at various local and nationallevelsand have earned recognitions. Some of them are mentioned hereunder:-

Dalmia Bharat Ltd. received Best Corporate Social Responsibility Award2017 by World CSR Congress

DalmiaDalmia Bharat Fecilitated by Indian Cement Review Award 2016 as Fastest Growing Cement Company-Large Category

DCBL received CII-ITC Sustainability Award 2016, 2012 & 2013 for contributions to sustainability and conservation of the environment

DBL has bagged 4 awards"Best Corporate Social Responsibility Practices, Talent management, Managing Health at work, Excellence in training" from WORLD HRD CONGRESS -2015

Dalmia Cement (Bharat) Ltd. won Golden Peacock Award for CSR 2015

Ariyalur, T.N. Unit:

All India First on Safety Award-2015- Large Scale Manufacturing Sector conducted by FICCI

CII EHS Award with 4 star rating for 2015

Kadapa, A.P. Unit:

Bagged the National level FIMI Environment Excellence Award for the year 2015-16

Bagged CSR & Environment Award from Green Tech Foundation-2015

Six Awards in various categories to Kadapa- Nawabpet- Talamanchipatnam Mines in 52nd Annual Mines Safety Week-2014

Dalmiapuram, T.N. Unit:

Received National Award for Outstanding Industrial Relations 2015-16 by All India Organization of Employers(AIOE)

Mines of DPM have received various awards by MEMC Council under aegis of Indian Bureau of Mines (IBM) in 2016 along with Overall First Prize in Conventional Category to Amalgamated PNR Mines & Overall Second Prize in Non-Conventional Category to Kallakudi Mines.

Periathirukonam Limestone Mine was awarded 5 Star Rating by the Ministry of Mines, Govt of India, 2016

DPM and Ariyalur felicitated by Excellence Environment, Health & Safety"4 star rating"Award for the 3rd Consecutive year

NCBM award with "Best Environment Excellence –FY 2014-15".

CII EHS award with 4 star rating for 2014 &15,*Best Energy Efficient Unit Award – CII in the year 2012-2013.Green award- by govt. of Tamilnadu in the year 2012-13*

Adhunik Cement Limestone mine:

1st Place in Overall Mines Performance by DGMS, Guwahati region including 9 other awards in various categories of 2012-13.

2nd prize in Overall Performance and 6 other prizes in different categories in XIIIth North East Mettaliferous Mines Safety Week 2015-16 competition.

OCL India Ltd.:

Awarded for Best Overall Excellence in CSR under National Awards for Excellence in CSR & Sustainability.

Lanjiberna Limestone & Dolomite Mines received "Appreciation Award for 2015" from Odisha Pollution Control Board in recognition of effective pollution control measures and sound environment management practices and received 6 awards under various categories in 52nd Annual Mines Safety Week-2014 under the aegis of Directorate General of Mines Safety, Chaibasa Region.

2.2 BRIEF DESCRIPTION OF NATURE OF THE PROJECT

The lease area is 395.965 ha. Total probable reserve available is 45.99 MT of Limestone. The expected life of mine will be 34 years.

At the conceptual stage, the total excavated area will be 239.0 ha., which will be partly used as a water reservoir (100.0 ha.), 139.0 ha. will be reclaimed and rehabilitated by plantation. Water reservoir will ultimately help in recharging the water table and may be put to various community uses.

Total Water requirement is estimated to 75 KLD which is proposed to be met by ground water or local authorities. The ultimate pit limit will be 275 MSL at conceptual stage. The water table is at 45-50m below the general ground level. Water table in Pre-monsoon is 269 MSL and 274MSL in Post – monsoon season. Thus ground water table will not be encountered during working till life of mine.

2.3 NEED FOR THE PROJECT & ITS IMPORTANCE TO THE COUNTRY & OR REGION

India is the second largest producer of cement in the world. India's cement industry is a vital part of its economy, providing employment to more than a million people, directly or indirectly. India has a lot of potential for development in the infrastructure and construction sector and the cement sector is expected to largely benefit from it. Some of the recent major government initiatives such as development of 98 smart cities are expected to provide a major boost to the sector.

Limestone and clay are the main components of cement; very small amounts of aluminum, iron or gypsum are also typically required. Limestone is used due to its high content of calcium oxide, which is the main component of cement and usually makes up around 65 percent of the final product. The amount of clay used depends on its content of silicon oxide, which makes up approximately 20 percent of cement powder.

The lease of limestone has been proposed for the excavation of mineral for cement grade limestone. This mine will generate 1.5 Million TPA of limestone which will cater the demand of local as well as distant demand of limestone.

The mining and associated activities in the mineral bearing areas will bring about gains in gross domestic product, i.e. there is though a minor contribution by the proposed project but will add to the gains in the G.D.P. The applicable royalty, taxes paid by applicant will be paid thereby contributing to the regional revenue.

A total of 66 persons will be employed in this mine. It will create employment for local people population of the village. Along with mining activities, plantation will also be done in the mine area which will improve the local environment to a certain extent. It will also bridge the gap between demand and supply of cement to the consumers. The project will help in the overall growth of the region.

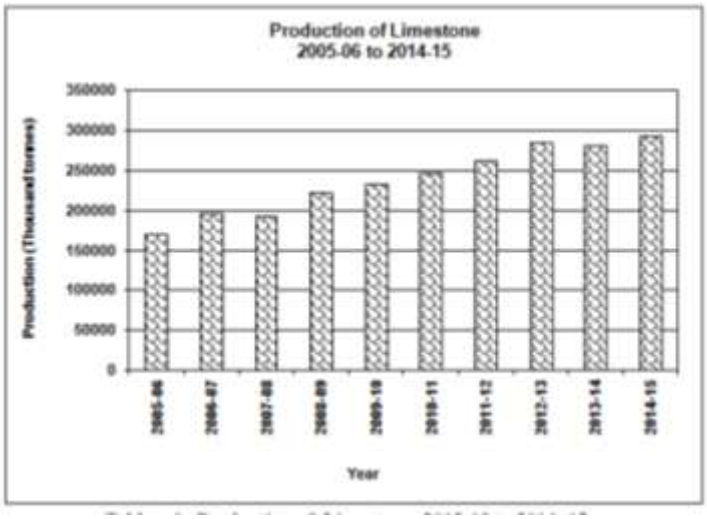
2.4 DEMAND - SUPPLY GAP

In India limestone has a wide application and demand

The production of limestone in the country for 2014-15 at 292.8 million tonnes increased by about 4% as compared to that of the previous year owing to high demand in the market. There were 740 reporting mines in 2014-15 as against 779 during the previous year. Twenty five mines, each producing more than 3 million tonnes per annum contributed about 41% of the total production of limestone in 2014-15. The share of 13 mines, each in the production range of 2 to 3 million tonnes was about 11% of the total production. About 23% of the total production was contributed by 46 mines, each producing 1 to 2 million tonnes, annually. The remaining 25% of the total production was reported by 656 mines and four associated mines during the year. Twenty five principal producers contributed about 79% of the total production. About 4% of the production was reported by public sector mines as against 4.1% in the previous year. About 97% of the total production of limestone during 2014-15 was of cement grade, 2% of iron & steel grade and the rest 1% consisted of chemical grade. (*Ref.: Indian Minerals Yearbook, 2015 (Part- III: Mineral Reviews), 54th Edition, Limestone & Other Calcareous Minerals, IBM: March, 2017*)

Major producing areas/ Supply

Rajasthan was the leading producing state accounting for (21%) of the total production of limestone, followed by Madhya Pradesh (13%), Andhra Pradesh (12%), Gujarat (9%), Karnataka, Telangana, Chhattisgarh and Tamil Nadu (8% each), Himachal Pradesh and Maharashtra (4% each) and the remaining 5% was contributed by Meghalaya, Odisha, Uttar Pradesh, Jharkhand, Assam, Kerala, Bihar, and Jammu & Kashmir. Mine-head closing stock of limestone for the year 2014-15 was 13.3 million tonnes as against 12.4 million tonnes for the previous year. Average daily labour employment in limestone mines in 2014-15 was 21,655 as against 22,977 in the previous year



Source: Indian Minerals Yearbook, 2015 (Part- III : Mineral Reviews), 54th Edition, Limestone & Other Calcareous Minerals, IBM: March, 2017.

There is a large gap between the demand of limestone and the supply of Limestone. The proposed project aims to fill the demand – supply gap through optimum allocation and excavation of natural resources required to meet the demand effectively.

2.5 IMPORTS VS. INDIGENOUS PRODUCTION

The limestone produced from DCBL is meant for the captive consumption in the cement plant. .

2.6 EXPORT POSSIBILITY

No exports of limestone are proposed.

2.7 DOMESTIC/ EXPORT MARKETS

There has always been a huge demand of limestone in both domestic and foreign markets. It is normally demanded for construction, cement, glass, sugar, etc. industries. Due to high cost of transportation, it is normally exported in finished form of slabs, tiles, lime, cement, etc. However, the proposed mining activity is not envisaging any exports. The limestone produced from mine is meant for the captive consumption in the cement plant.

2.8 EMPLOYMENT GENERATION (DIRECT AND INDIRECT) DUE TO THE PROJECT

The proposed project generates employment for around 66 people. Preference will be given to suitable local people for employment. In spite of direct employment, there will be many indirect employment after coming of the proposed project along with the interlinked cement plant. Following staff & workers are proposed to be employed for the proposed mine:-

Table 2: Provisional Number of Proposed Staff and Workers

S. No.	Category	No. of Persons
1.	Mining Engineer/ First Class Mines Manager	01
2.	Second Class Mines Manager	02
3.	Mechanical Engineer	01
4.	Geologist	01
5.	Mines Foreman	02
6.	Electrical Foreman	01
7.	Mechanical Foreman	01
8.	Mining Mate cum Blaster	02
9.	Skilled	15
10.	Semi-skilled	20
11.	Un-skilled	20
Total		**66**

**Some of the above personnel would be availed with the interlinked captive mines of DCBL*

3.0 PROJECT DESCRIPTION

3.1 TYPE OF PROJECT INCLUDING INTERLINKED AND INTERDEPENDENT PROJECTS, IF ANY.

The proposed project is an opencast conventional fully mechanized mine which shall meet the partially meet the requirement of limestone for the envisaged cement plant of DCBL in Satna District, MP.

The proposed project is interlinked with the envisaged integrated cement plant and two following captive mines namely:

1. Proposed project- Pagra-Jhiriya Limestone Mine-395.965 ha– Granted, executed and registered
2. Jamuna limestone Mine (89.234 ha) – Granted, executed and registered
3. AML Janardanpur Limestone Mine –for which grant order is awaited.

3.2 LOCATION (MAP SHOWING GENERAL LOCATION, SPECIFIC LOCATION, AND PROJECT BOUNDARY AND PROJECT SITE LAYOUT) WITH COORDINATES

The proposed Pagara-Jhiriya Limestone mine is located in Village(s) – Pagara, Jhiriya Kothar, Jhiriya Bajpain & Jhiriya Koparihan, Tehsil –Amarpatan, District – Satna, Madhya Pradeshin an area of 395.965 hectare. The project site falls in Survey of India Toposheet No. 63 H/3.

The geographical location with respect to boundary pillars of the proposed project are:-

Table 3: Geographical Position of the Boundary Pillars

Pillar No.	Latitude (N)	Longitude (E)	Pillar No.	Latitude (N)	Longitude (E)
1	24°28' 17.3"	81°10' 42.5"	2	24°28' 15.2"	81°10' 51.3"
3	24°28' 18.3"	81°10' 52.8"	4	24°28' 16.7"	81°10' 59.4"
5	24°28' 13.8"	81°10' 58.8"	6	24°28' 13.5"	81°11' 00.1"
7	24°28'04.8"	81°10' 58.4"	8	24°28' 04.0"	81°11' 02.9"
9	24°27' 56.0"	81°10' 59.3"	10	24°27' 57.4"	81°10' 47.6"
11	24°27' 51.6"	81°10' 45.8"	12	24°27' 51.9"	81°10' 40.6"
13	24°27' 43.0"	81°10' 37.6"	14	24°27' 43.8"	81°10' 34.9"
15	24°27' 26.9"	81°10' 32.0"	16	24°27' 22.8"	81°10' 32.0"
17	24°27' 16.2"	81°10' 44.3"	18	24°27' 17.3"	81°10' 44.1"
19	24°27' 15.8"	81°10' 54.1"	20	24°27' 19.9"	81°10' 54.5"
21	24°27' 17.3"	81°11' 02.4"	22	24°27' 03.4"	81°11' 10.6"
23	24°27' 03.6"	81°11' 12.8"	24	24°27' 02.2"	81°11' 18.6"
25	24°27' 07.7"	81°11' 20.6"	26	24°27' 08.6"	81°11' 18.7"
27	24°27' 16.6"	81°11' 19.3"	28	24°27' 18.8"	81°11' 26.8"
29	24°27' 14.7"	81°11' 37.2"	30	24°27' 18.8"	81°11' 37.9"
31	24°27' 21.5"	81°11' 45.4"	32	24°27' 23.2"	81°11' 46.4"
33	24°27' 22.0"	81°11' 52.0"	34	24°27' 17.6"	81°12' 05.4"
35	24°27' 14.4"	81°12' 20.7"	36	24°27' 01.6"	81°12' 23.3"

37	24°27' 00.6"	81°12' 27.6"	38	24°26' 56.1"	81°12' 25.5"
39	24°26' 51.9"	81°12' 15.1"	40	24°26' 52.4"	81°12' 03.8"
41	24°26' 49.9"	81°12' 03.1"	42	24°26' 50.8"	81°11' 56.6"
43	24°26' 53.9"	81°11' 57.3"	44	24°26' 54.1"	81°11' 56.2"
45	24°26' 51.1"	81°11' 55.3"	46	24°26' 56.9"	81°11' 35.3"
47	24°26' 59.3"	81°11' 14.3"	48	24°26' 54.3"	81°11' 14.4"
49	24°26' 54.7"	81°11' 11.1"	50	24°26' 41.5"	81°11' 07.9"
51	24°26' 45.9"	81°10' 37.9"	52	24°27' 14.1"	81°09' 42.6"
53	24°27' 21.6"	81°09' 45.7"	54	24°27' 22.9"	81°09' 42.6"
55	24°27' 28.6"	81°09' 43.9"	56	24°27' 27.0"	81°09' 52.2"
57	24°27' 38.1"	81°09' 56.7"	58	24°27' 35.8"	81°10' 02.9"
59	24°27' 45.1"	81°10' 06.5"	60	24°27' 44.7"	81°10' 11.9"
61	24°27' 42.5"	81°10' 11.2"	62	24°27' 40.2"	81°10' 19.8"
63	24°27' 48.5"	81°10' 21.2"	64	24°27' 51.2"	81°10' 16.0"
65	24°27' 54.8"	81°10' 16.9"	66	24°27' 58.2"	81°10' 25.5"
67	24°28' 02.3"	81°10' 30.1"	68	24°28' 02.2"	81°10' 33.6"
69	24°28' 10.6"	81°10' 37.2"	70	24°28' 10.2"	81°10' 40.2"

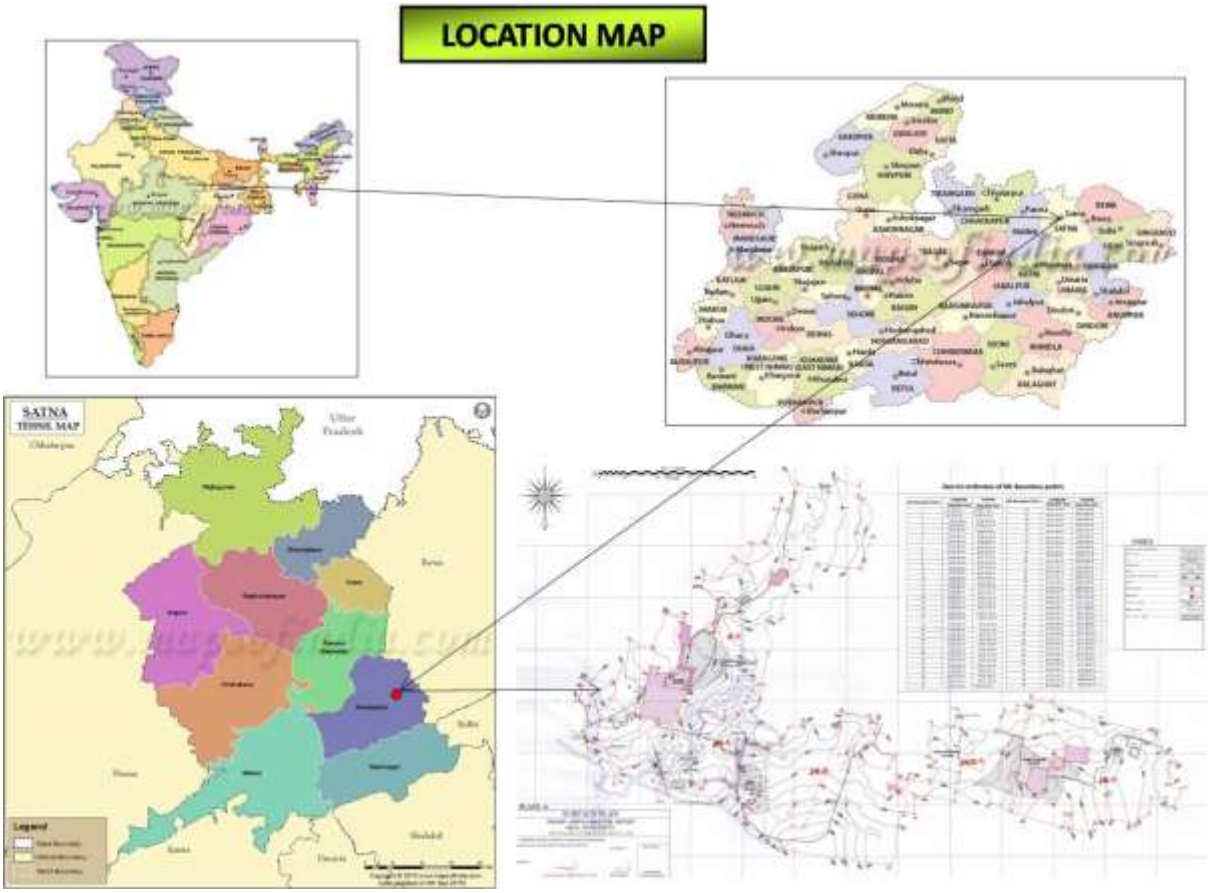


Figure: General Location Map

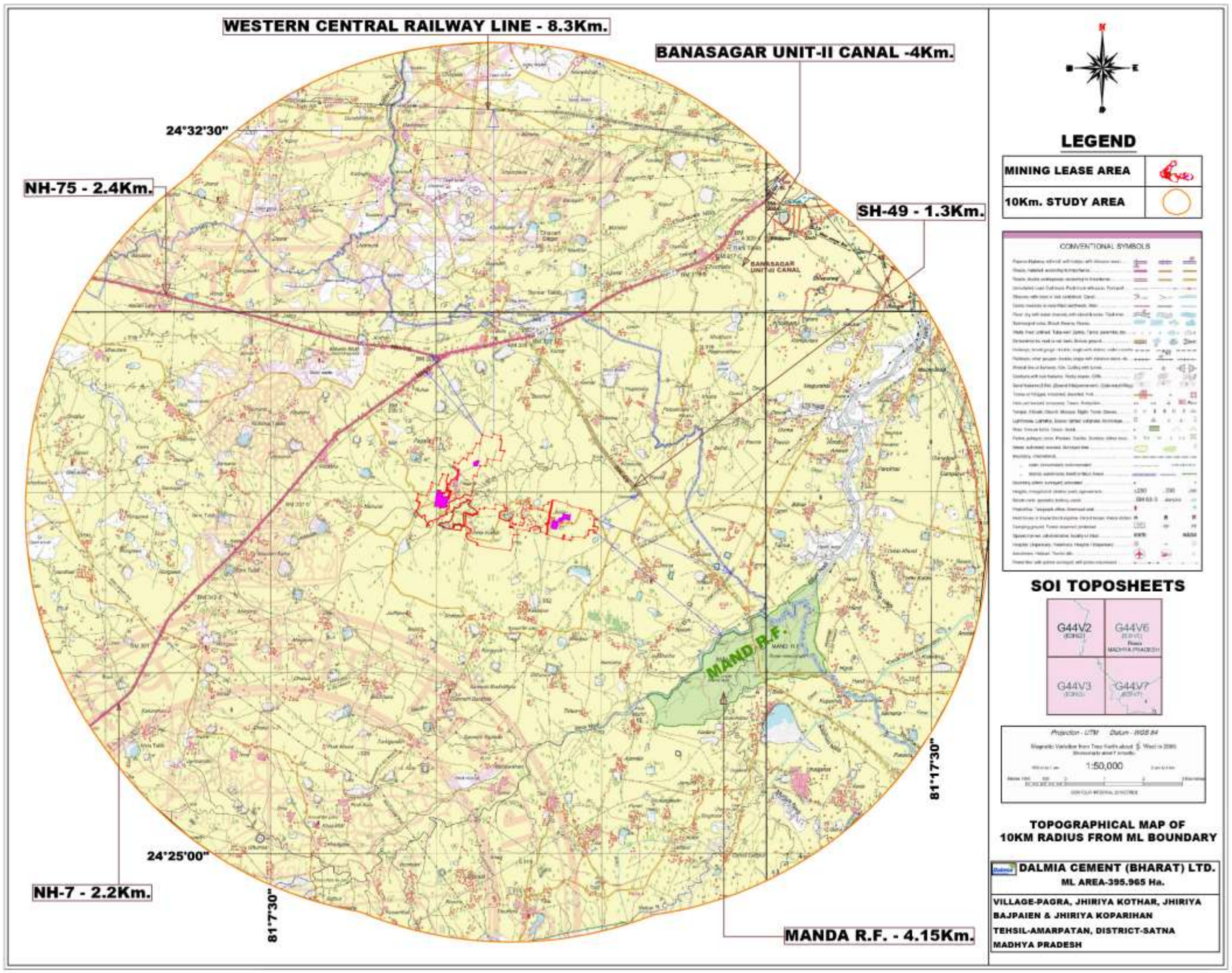


Figure: Specific Location Map

3.3 DETAILS OF ALTERNATE SITES CONSIDERED AND THE BASIS OF SELECTING THE PROPOSED SITE, PARTICULARLY THE ENVIRONMENTAL CONSIDERATIONS GIVEN INTOSHOULDBE HIGHLIGHTED.

- Mining lease site is selected on the basis of occurrence of mineral for suitable end use.
- DCBL was initially sanctioned prospecting license for 2 years period by the State Government of MP vide order no. F-2-74/09/12/1 Bhopal Dated- 22.05.2010 over an area of 735.296 ha. The prospecting license deed in form F was executed on 08.06.2010 for two year period w.e.f. 08.06.2010 - 07.06.2012. The applied area is part of area held under prospecting license.
- DCBL applied for grant of mining lease over 461.806 ha. mineralized area out of total 735.296 ha area granted under PL vide application dated 29.03.2012. The State Government of MP has taken decision to grant precise area under mining lease and communicated such decision vide letter No. F-3-08/2013/12/1 Bhopal Dated- 24.01.2014 over 395.965 ha. after excluding prohibited area. While granting the ML area, the state Govt. has excluded the road, nalla, habitation and applicable statutory barriers for it.

  There are no wild life sanctuaries, national parks, biosphere reserves, wild life corridors elephant/tiger reserves, within 10-km radius of the study area.

3.4 SIZE OR MAGNITUDE OF OPERATION

The size and magnitude of the lease area is as given below:-

Table 4: Size or Magnitude

S. No.	Particulars	Details
1.	Lease Area (Ha.)	395.965
2.	Probable Reserves	45.99 Million Tonnes
3.	Production (ROM)	2.41 Million Tonnes
	• Limestone	1.5 Million Tonnes
	• Soil	0.56 Million Tonnes
	• OB	0.35 Million Tonnes
4.	Life of Mine (Years)	34
5.	Period of the Lease	50 Years
6.	Total Man Power (Nos.)	66

3.4.1 REGIONAL GEOLOGY

Vindhyan Super group is exposed in a vast area. In stretches from Bihar in the east to Rajasthan in the west forming NNE-SSW syncline. Limestone of the area belongs to Bhander group. The Vindhyan super group consists of four main groups named as follows:

Table 5: Regional Geology

GROUP	FORMATION
BHANDER	Upper Bhander Sandstone
	Sirboo Shale
	Nagod Limestone
	Ganurgarh Shale
REWA	Govindgarh Sandstone
	Jhiri Shale
	Asan Sandstone
	Panna Shale
KAIMUR	Dhandraul Sandstone
	Mangesar Formation
	Bijaygarh Shale
	Ghaghar Sandstone
	Susnai Breccia
	Sasaram Sandstone
SEMRI	Baghwar Shale
	Rohtasgarh Limestone
	Rampur Formation
	Salkhan Limestone
	Koldiha Shale
	Deonar Formation
	Kajrahat Limestone
	Arangi Limestone
	Deolond Formation

3.4.2 LOCAL GEOLOGY

The limestone of the lease area belongs to Bhander group of Vindhyan super group. The general Stratigraphic sequence of the lease area is given below:

Table 6: Litho units found in the mining lease area

Recent	Alluvium/ Top Soil
Bhander Group	Faint Grey to Light green Shale, weathered at some places. Grey to dark grey Limestone with inter bedding and intercalation of Shale Siliceous Limestone Grey Shale Dark Grey Limestone Shale

Solution cavities: - A striking feature of the area is the frequent occurrence of solution cavities. These solution cavities are invariably found filled with soil, Clay, Kankar and pieces of limestone cemented together by limestone.

Soil: - The area has a cover of soil which varies in thickness from 0m. to 4.0m. The soil is sandy in nature.

3.4.3 HYDROGEOLOGY

The main source of ground water recharge in the Satna district is rainfall. Various geological formations ranging in age from Archaeans to Recent are occurring in different part of area, making geological set up complex. However, Vindhyans are main rock units of the area, covering more than 95% of geographical area of the district. Among Vindhyan rocks both Lower and Upper Vindhyans are representing the area, but Lower Vindhyans are mostly

occuping in southern part of the area in Son Sub-basin. Occurrence and movement of ground water in hard rocks is essentially by development and nature of secondary joints and fractures while solution cavities in limestones also play an important role. Ground water in general occurs under unconfined to semi-confined conditions. The occurrence and movement of ground water in different lithological units can briefly be described as:

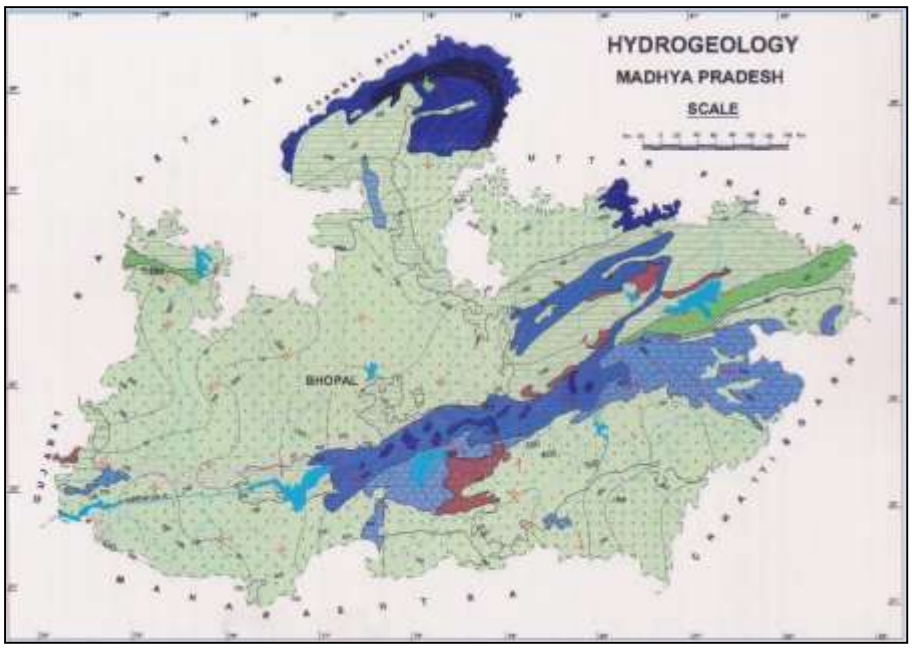


Figure 2: Geo-hydrological Map of the Madhya Pradesh.

Kaimur: The Kaimur rocks forming the hilly tracts of the district comprise consolidated quartzites, sandstones & shales. These rocks possess meager porosity and permeability. Joints, fissures & fractures developed in these rocks provide secondary porosity. The yield of the rocks of the Kaimur series is poor

Rewa Series: The Rewa sandstones are hard & compact with little primary porosity. The weathered & fractured sandstones control occurrence & movement of ground water on a limited scale. In the topographic low areas weathered residuum attains a maximum thickness of 5 m. The yield of sandstones & shales ranges from 1 to 3 and

Bhander Series: The Gunurgarh & Sirbu shales are poorly permeable due to their susceptibility to weathering. TA weathered mantle of 5 to 10 meters has been developed in the area. The dug wells tapping this weathered horizon yields limited quantity of water. At deeper depths, due to seepage of ground water through joints and fractures solution cavities developed along bands of gypsum and limesones. The ground water occurring in artesian condition with high piezometric heads are occurring in these solution cavities and they are tapped by some dug cum bore wells & bore wells. Limestones are hard, compact but jointed & fractured. The weathered zone in this extends down to a maximum depth of 5 m in topographic low areas. Along the joints & planes of stratification crack in limestone &

solution cavities are developed. These Cavernous limestones hold good amount of ground water. The drilling carried out by Madhya Pradesh Public Health Engineer in Department in the western part of the Rewa town reveals Cavernous water bearing zones below zones below 24 m at village Madhavpur and below 39 m at village Dholgarh and Nowbastha. The yields is upto 450 m^3/day per well have been reported.

3.4.4 MINERAL RESERVES

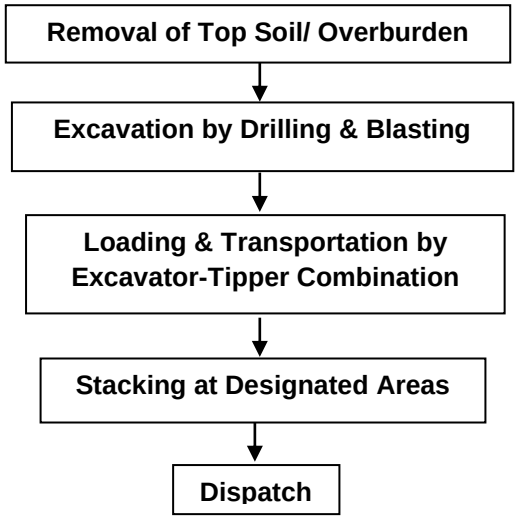
The mineral reserves have been estimated by UNFC classification in to proved, probable & possible reserves. The quantity of reserves is arrived as following:-

Table 7: Reserve Estimation according to UNFC Classification

United Nations Frame-work Classification (UNFC)	UNFC code	In million tones	Grade
Proved Mineral Reserve	111	-	The Limestone of the lease area is of cement grade.
Probable Mineral Reserve	122	45.99	
Feasibility Mineral Resource	211	-	
Pre-Feasibility Mineral Resource	222	35.752	

3.5 PROJECT DESCRIPTION WITH PROCESS DETAILS (A SCHEMATIC DIAGRAM/ FLOW CHART SHOWING THE PROJECT LAYOUT, COMPONENTS OF THE PROJECT ETC. SHOULD BE GIVEN).

The proposed mining operations will be carried out by open cast mechanized method. All operations of mining will be done by deployment of heavy earth moving machineries for deep hole drilling, excavation, loading & transport. Various mining activities such as drilling, blasting, loading and transportation will be so conducted as to ensure maximum mineral conservation and minimum environmental degradation. The process flow diagram given below depicts the mining process:-



3.5.1 YEAR WISE PRODUCTION DETAILS

The details of year wise production for the first five years are given below:-

Table 8: Year wise production for the Five Years Period

Year	Soil in cum	OB/waste in (cum)	Production Limestone (t.)
1st	14500	-	-
2nd	17500	10800	216000
3rd	120000	40350	807000
4th	140000	61840	1236800
5th	348000	176000	1500000
Total	640000	288990	3759800

Source: Approved Mining Plan

After the plan period, mining will be undertaken in line with the approved mining scheme.

3.5.2 PROPOSED METHOD OF MINING

The proposed method of mining will be opencast conventional fully mechanized mining. Since the mineral is exposed at most of the places, the limestone interposed with soil and OB would be excavated by loader cum excavator. Drilling in hard strata will be done by DTH drills of hole dia 115mm to 150mm.

3.5.2.1 Salient Features of Mining Method

The proposed mining operations will be carried out by open cast fully mechanized method. The salient features of proposed mining method are:-

- The bench height of OB has been proposed upto 4.0m & mineral has been proposed upto 7.0 m maximum and width will be equal to 30m.
- Drilling will be done by DTH drills of holes dia 115 mm to 150 mm.
- For blasting, three types of explosives will be used i.e. Emulsion explosive (cap sensitive) Slurry explosive (cap sensitive) and ANFO (non cap sensitive).

3.5.3 EXTENT OF MECHANIZATION

The details of equipments proposed to be used in mining operation are listed below:-

Table 9: List of Machineries

S. No.	Machine Type or its equivalent	Capacity/ Size	Proposed Units	Motive Power	H.P.
1.	Drilling machine	10m/Hr.	2	Diesel	400

2.	Loading machine Hyd. Shovel	4.0 Cu.m 3.5 Cu.m	5	Diesel Diesel	320 295
3.	Dumpers	60 t.	9	Diesel	700
4.	Bull Dozer	63 Cu.m 10.44 Cu.m	1 1	Diesel Diesel	360 360
5.	Dewatering pumps	290 – 2000 GPM	3	Diesel & Electric	30-125
6.	Explosive van	10 t.	1	Diesel	95
7.	Water tanker with water sprinkler	18,000 ltrs	1	Diesel	375
8.	Maintenance van	-	1	Diesel	95
9.	Crane	3-10 t.	1	Diesel	60
10.	Rock Breaker	0.90 Cu.m	1	Diesel	114
11.	Air Compressor	400 cfm 620 cfm	1 1	Diesel	106 200
12.	Tractors	-	2	Diesel	58
13.	Portable diesel engine driven welding set	10 t.	2	Diesel	-

3.5.4 CONCEPTUAL MINING PLAN

The applied area is having limestone throughout the area. The probable reserves are arrived to be 45.99 Million Tonnes. The annual production is estimated to be Limestone is 1.5 Million Tonnes. Life of the mine will be 34 years. Ultimate pit level will be 275 MSL.

3.5.4.1 Land Use Pattern

The land use for mining and allied purposes is given below:-

Table 10: Conceptual Land Use Plan

S. No.	Particulars	Present Land Use (ha.)	At the end of 5th year (ha.)	At the end of life of Mine (ha.)
1.	Pit area	2.50	30.30	239.0 (Water Reservoir = 100 Ha. & Plantation = 139 Ha.)
2.	Dump Area Stack (Sub grade)	-	8.85	-
3.	Road	1.0	1.0	1.0 (Public Use)
4.	Infrastructure	-	1.0	-
5.	Plantation	6.0	8.50	135.965 (Plantation)
6.	Protection Bunds and Drains	-	2.75	-
7.	Un-disturbed area	386.465	343.565	20
Total		**395.965**	**395.965**	**395.965**

Source: Approved Mining Plan

3.5.5 DRILLING

The excavation of mineral is proposed by excavators. The mineral is easily exploitable by excavators. The hard strata are proposed to be excavated after drilling and blasting. Drilling will be done by DTH drills of holes dia 115 mm to 150 mm.

3.5.6 BLASTING

The controlled blasting is proposed by adopting all the safety measures as per "M.M.R.1961" and with the permission of DGMS. For blasting, three types of explosives will be used i.e. Emulsion explosives (cap sensitive), Slurry explosive (cap sensitive) and ANFO (Non cap sensitive). Cap sensitive explosives are used as base charge (@ 12 to 15% of total explosive) where as non cap sensitive explosives are used as column charge.

Table 11: Broad Blasting Parameters

Blasting Parameters	Mineral Bench (6.0m)
Blasting Pattern - Burden - Spacing - No of Rows	 4.00m 5.00 m 2
Bench Height	6.00m
Depth of Hole	6.60m
Diameter of Hole	150 mm

The type of initiating device for conducting blasting operation shall be shock tubes of Non electric type (NONEL/ RAYDED etc.) or electronic detonator type. Controlled blasting will be done using delay detonator to prevent flying fragments which may cause injury to local inhabitants within danger zone.

3.5.7 MINERAL TRANSPORTATION

The mineral will be transported to the crusher proposed to be erected in the ML. From crusher the limestone will be transported to the destination cement plant by tippers.
Dumpers of 60T will be used for transportation of mineral to the crusher.

3.6 RAW MATERIAL REQUIRED ALONG WITH ESTIMATED QUANTITY, LIKELY SOURCE, MARKETING AREA OF FINAL PRODUCT/S, MODE OF TRANSPORT OF RAW MATERIAL AND FINISHED PRODUCT.

No raw material will be required for production of Limestone however explosives for blasting and fuel/diesel for HEMM will be required during operation. The mineral will be transported to the crusher proposed to be erected in the lease area. From crusher the limestone will be transported to the destination cement plant by tippers.

3.7 RESOURCE OPTIMIZATION/ RECYCLING AND REUSE ENVISAGED IN THE PROJECT, IF ANY, SHOULD BE BRIEFLY OUTLINED.

Limestone will be sent to cement plant for further utilization. The OB/ waste will be utilized for backfilling. Top soil will be used for plantation. The cutoff grade of limestone has been taken as 34% CaO and 5% MgO. To the possible extent, suitable blending of ROM limestone will be done using the stacker reclaimer in the plant in the best interest of mineral conservation. No sub-grade mineral will be generated. All ROM mineral will be used. The cut off grade will be brought to threshold value in the best interest of mineral conservation.

Rainwater harvesting will be done using excavated pit void. Water conservation will thereby reduce exploitation of groundwater.

3.8 AVAILABILITY OF WATER ITS SOURCE, ENERGY/ POWER REQUIREMENT AND SOURCE SHOULD BE GIVEN

3.8.1 WATER

The total water requirement for the proposed project will be75 KLD. The detailed breakup of the same is given below:-

Table 12: Water Demand

S. No.	Particulars	Water Demand (KLD)	Source
1.	Domestic	5.0	Ground Water or local authority
2.	Dust Suppression	25.0	
3.	Plantation	35.0	
4.	Other Processes	10.0	
Total		**75**	

3.8.2 POWER

Power demand of about 0.5 MW will be supplied from Madhya Pradesh Madhya Kshetra Vidyut Vitaran Company Limited (MPMKVVCL).

3.9 QUANTITY OF WASTES TO BE GENERATED (LIQUID AND SOLID) AND SCHEME FOR THEIR MANAGEMENT/DISPOSAL.

About, 640000 Cu.m. soil will be generated from the proposed mine lease during plan period which will be used for plantation. About 2,88,990Cu.m. of waste (OB) will be generated at the end of plan period. The OB soil and waste will be stacked towards north-east side of the applied area. The dump will be suitably terraced of 10.0m height. The side will be sloped to angle of repose i.e. less than 28^0.Dumps will be planted with grasses, legumes etc. to arrest soil erosion to a great extent. The protective measures for siltation of agriculture land in the buffer zone and over flow during monsoon will be appropriately taken. Garland drain will be constructed along with settling tank at corner. It will be regularly de-silted especially after rains. Protective bund will also be constructed in

boundary to prevent over flow during rains. At conceptual stage, waste will be used for backfilling and topsoil will be spread over it for plantation. There will be no dump at the end of the life of the mine.

The details as tabulated below:-

Table 13: Waste Generation (Liquid and Solid) other than mining activity

Activity	Quantity of waste	Proposed	Treatment / Disposal
Municipal Solid Waste	No. of mine workers	66	Municipal Corporation sites/Disposed off suitably
	Biodegradable Waste (kg /day)	7.425	
	Non-biodegradable waste (kg /day)	2.475	
	Total Waste Generation @ 0.15 kg/day approx.	9.9	
Domestic Wastewater	Total Water Requirement (KLD)	5.0	Septic tank followed by soak pit
	Wastewater Generation (KLD)	3.75	
Workshop	Total Water Requirement (KLD)	7	Utilized for green belt development/dust suppress after treatment through Oil and grease trap
	Wastewater Generation (KLD)	5	

4.0 SITE ANALYSIS

4.1 CONNECTIVITY

Table 14: Connectivity

S. No.	Name	Distance (km) (From Lease Boundary)	Direction
Nearest Railway Station			
1	Rewa	10.10	NE
Nearest Airport			
2	Chorhata Airstrip, Rewa	5	NE
3	Satna Airport	32	NW
4	Khajuraho airport	130.0	NW
Nearest Highway			
5	NH – 7	2.2	N
6	Rewa-Satna N.H.-75	2.4	N
7	Bela-Govindgarh S.H. 49	1.3	E

Note: Distances are measured from Google Earth

4.2 LAND FORM, LAND USE AND LAND OWNERSHIP

4.2.1 LANDFORM

The lease area is almost plain having gentle slope towards north-east. The highest level is 329 MSL towards south-west while the lowest elevation is 319 MSL in north-east.

The drainage of applied area is towards east. The area is devoid of any major rivers, however, minor seasonal rivulets exists and these drain into Bihar River which is located at about 4.15 kms, SE. No mining is proposed nearby the habitation. The State Government of MP has granted mining lease after excluding prohibited area such as road, nalla, habitation etc. and applicable statutory barriers for it.

4.2.2 LAND USE

The land as per revenue records is Agriculture (370.965 ha.) and Barren land (25.0 ha.).

The detailed land use pattern is given in point no. 1.2.

4.2.3 LAND OWNERSHIP

The land is Partly Government land and partly private land.

4.3 TOPOGRAPHY (ALONG WITH MAP)

The lease area is almost plain having gentle slope towards north-east. The highest level is 329 MSL towards south-west while the lowest elevation is 319 MSL in north-east.

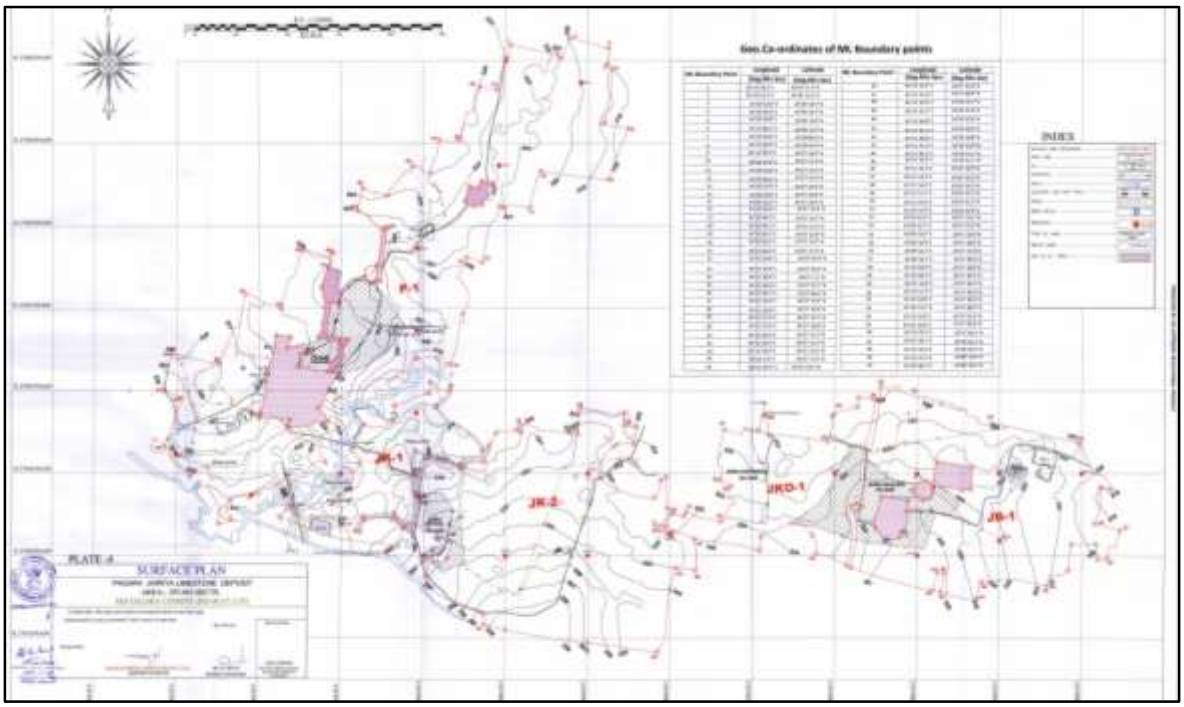


Figure: Surface Map

4.4 EXISTING LAND USE PATTERN (AGRICULTURE, NON-AGRICULTURE, FOREST, WATER BODIES (INCLUDING AREA UNDER CRZ)), SHORTEST DISTANCES FROM THE PERIPHERY OF THE PROJECT TO PERIPHERY OF THE FORESTS, NATIONAL PARK, WILD LIFE SANCTUARY, ECO SENSITIVE AREAS, WATER BODIES (DISTANCE FROM THE HFL OF THE RIVER), CRZ. IN CASE OF NOTIFIED INDUSTRIAL AREA, A COPY OF THE GAZETTE NOTIFICATION SHOULD BE GIVEN.

Table 15: Existing Land Use Pattern

S. No.	Particulars	Existing Land Use (ha.)
1.	Old Pit area	2.50
2.	Dump Area	--
3.	Road& Infrastructure	1.0
4.	Mineral Storage	--
5.	Plantation	6.0
6.	Un-disturbed area	386.465
Total		**395.965**

4.5 EXISTING INFRASTRUCTURE

The same has been given in point no. 3.8 and 4.0.

4.5.6 BASIC AMENITIES

The details of basic amenities like schools, hospitals and community center located nearby the mine site are mention below:-

Table 16: Basic Amenities

Name	Distance (Km) (From Lease Boundary)	Direction
Education		
Maharaja Public School, Bela	2.60	NNE
Gurukul Eng. Mid. School, Babupur	5.45	NE
Delhi Public School, Rewa	12.90	NE
Hospitals		
Vindhya Hospital And Research Centre, Rewa	12.60	NE
Kushabhau Thakrey District Hospital	12.15	ENE
Source: All distances are taken with respect to Google Earth.		

4.6 SOIL CLASSIFICATION

The ML area has a cover of soil which varies in thickness from 0m. to 4.0m. The soil is sandy in nature. Excavated soil will be used for plantation in barriers and on backfilled area.

Four type of soil is found in Madhya Pradesh State which is namely:

Shallow & Medium Black Soil: - This type of soil is found mainly in Betul, Chhindwara and Seoni.Shallow and medium black colored soils constitute the maximum part of the black soil. It is comparatively less fertile than the medium deep black soil. The whole northern part of the Malwa plateauand Nimad region comprises this soil. It is 15 cm to one metre depth and the colour of soil is grey or light black.

Deep Medium Black Soil:- This type of soil is found mainly in Narsinghpur, Hoshangabad, Harda, Shahdol, Umaria, Jabalpur, Katni, Sagar, Damoh, Vidisha, Raisen, Bhopal, Sehore, Rajgarh, Ujjain, Dewas, Shajapur, Mandsaur, Neemuch, Ratlam, Jhabua, Dhar, Indore, Khargone, Barwani, Khandwa, Guna (Partly), Shivpuri (Partly), Datia (Partly) and Sidhi (Partly), Anuppur, Ashoknagar, Burhanpur, Alirajpur, Singroli.Medium and deep black coloured soil is extensively found in the Valley of Narmada River, Malwa Plateau, and Satpura mountain range, which contains about 20 to 60 percent clay and has a depth of near about 1 to 2 metres.

Alluvial Soil:-Alluvial soil is mostly found in the northwest part of Madhya Pradesh, mainly Gwalior,Morena district, Bhind district, Gwalior district and Shivpuri district. It is

spread over a large area in the frontier region of the Gangetic Valley, which is made of Bundelkhand gneiss and soil deposited by the Chambal River and its tributaries

Mixed Red & Black Soil: - This type of soil is found mainly in Mandla, Dindori, Balaghat, Rewa, Satna, Panna, Chhatarpur, Tikamgarh, Shivpuri (Partly), Guna.Mixed red and black soil spreads about 75 lakh hectares land comprising the Satpura region. Most of the part of the region has very shallow soil. Three districts namely Chhindwara district, Betul district, and Seoni district comprise this type of soil.

Clayey Soil: - is mostly found in the flood plain, and it is mainly transported and deposited by the rivers during flood. This soil is favourable for the production of wheat, sugarcane, and cotton. The areas which consist of this type of soil include Bhind, Morena, and Gwalior. Clayey soil is mainly deposited by the river Chambal and its tributaries. Vindhya region and the central part of the state of Madhya Pradesh have a deposition of mixed soil composed by red, yellow and black soils. The soil lacks phosphate, nitrogen, and carbon, and hence it is less fertile.

Soil of Satna:- The soils are depending upon lithology of the area. Small northen and southern part, Satna district is mainly underlain by sedimentary rocks of Vindhyan super group. In plateau area of the district which is occupied by shales with quartzites, Lime stones, conglomerates and sand stones are covered by "Red and Yellow Soils" and taxonomically it is designated as "Haplustults". Upland area of the district representing hill ranges is occupied by "Skeletal or Gravelly soils" and it is classified as "Lithic Entisols" from soil taxonomy point of view. Northern part of the area which is extension of Gangatic Plains is covered by "Alluvial Soil" and soil type is "Ustochrepts". Southern part of the district in Son valley area is underlain by "Alluvial soils" which is thin and gravelly fertile soil.

4.7 CLIMATE

The climate of Satna district is characterized by a hot summer with general dryness, except during the south-west monsoon season. The year may be divided into four seasons. The cold season from December to February is followed by the hot season from March to about middle of June. The period from the middle of June to September is the south-west monsoon season. October and November form the post-monsoon or transition period.

The normal annual rainfall of Satna district is 1092.1 mm. The district receives maximum rainfall during south-west monsoon period (i.e. June to September) and about 87.7% of annual rainfall is received during this period. Only 12.3% of the annual rainfall takes place between periods October to May. Rainfall forms the sole source of natural recharge to ground water regime and the rain water is available for recharge to ground water is mainly

during south-west monsoon period only. The maximum normal annual rainfall received in the district is 1106.5 mm at Satna and minimum is 1056.1 mm recorded at Maihar. The normal maximum temperature observed during the month of May is 41.9º C and minimum during the month of January is 8.7ºC. The normal annual mean maximum and minimum temperature of Satna district are 32.2ºC and 19ºC respectively.

During the south-west monsoon season the relative humidity generally exceeds 86% (August). The rest of year is drier .The driest part of the year is the summer season, when relative humidity is less than 29%. May is the driest month of the year.

The wind velocity is higher during the pre-monsoon period as compared to post-monsoon period. The maximum wind velocity 9.2 km/ hr observed during the month of June and minimum 2.8km/ hr during the month of November. The average normal annual wind velocity of Satna district is 5.4 km/ hr.

4.8 SOCIAL INFRASTRUCTURE AVAILABLE

The well-established social infrastructure like hospitals, temple, community center, roads, bridges, telecommunication and others similar are available/ existing within study area which is tabulated in point no. III of Form – 1.

5.0 PLANNING BRIEF

5.1 PLANNING CONCEPT (TYPE OF INDUSTRIES, FACILITIES, AND TRANSPORTATIONETC.) TOWN AND COUNTRY PLANNING/ DEVELOPMENT AUTHORITY CLASSIFICATION.

The proposed project is an opencast mine which shall meet partial requirement of limestone for envisaged cement plant of DCBL in Satna. About 1.5 MTPA limestone will be excavated from the proposed mine. The mineral will be transported to the crusher proposed to be erected in the lease area. From crusher the limestone will be transported to the destination cement plant by tippers.

5.2 POPULATION PROJECTION

As per Census survey of India the population in 2011 for Amarpatan tehsil (Rural) has been 2,05,353 people. The proposed mechanized project aims to employ 66 local workers directly in the region. Hence the project does not aim to contribute in the decadal population and further projections shall be given in the EIA/ EMP report with the population profile.

5.3 LAND USE PLANNING (BREAKUP ALONG WITH GREEN BELT ETC.)

The main aim of the green belt development is to improve the ecosystem to a maximum possible extent by designing the green cover with the same native species. Conceptually, 239 ha will be used for mining, out of which, 100 ha will be left out as water reservoir and 139 ha will be under plantation after reclamation and rehabilitation.1.0 ha will be under road and for other public use, 20 ha area will be undisturbed and 135.965 ha area will be under plantation. The year wise plantation programme in five years is given below:-

Table17:- Green Belt Development Programme (Inside the lease area)

Year	Un-worked Area		Dump (Reclaimed Area)		Total	
	Area (Ha.)	No. of Trees	Area (Ha.)	No. of Trees	Area (Ha.)	No. of Trees
Existing (Trees Not enumerated)	6.0	2,400 (Gap Plantation)	--	--	6.0	2,400
I	0.5	500	--	--	0.5	500
II	0.5	500	--	--	0.5	500
III	0.5	500	--	--	0.5	500
IV	0.5	500	--	--	0.5	500
V	0.5	500	--	--	0.5	500
At Conceptual stage	127.465	1,27,465	139	1,39,000	266.465	266465
Total	**135.965**	**1,32,365**	**139**	**1,39,000**	**274.965**	**2,71,365**

Native plant species as per CPCB guidelines to be planted. The list of plant species suggested includes the following criteria:-

- Tree species which are well adapted to local environmental setting, tall, bearing larger canopy cover and leaf area.
- Tree species of different size classes (small, medium and larger) were suggested to maintain the different canopy levels at vertical profile.
- Fruit trees in the selection list would help to attract birds and fruit eating bats which are locally available.

5.4 ASSESSMENT OF INFRASTRUCTURE DEMAND (PHYSICAL AND SOCIAL)

The applied area is about 32 kms south-east of District Headquarter Satna (M.P.). The approach road from Shah Mod to Jhinna passes through the applied area and connects N.H.-7. The nearest railway station is Rewa about10.10 Km distance in north east on Rewa- Satna BG section of WCR railway and Satna at a distance of about 36 km on Jabalpur-Allahabad BG section of Western Central Railway. All the basic infrastructure is available at Rewa, Rampur Baghelan & Amarpatan.

5.4 AMENITIES/FACILITIES

Following facilities are proposed for the smooth working of the mine:-

- Mine office;
- First aid room;
- Store facility;
- Toilet facility;
- Drinking water facilities;
- Rest shelters

6.0 PROPOSED INFRASTRUCTURE

6.1 INDUSTRIAL AREA (PROCESSING AREA)

Limestone will be sized by crusher proposed to be installed in the lease area.

6.2 RESIDENTIAL AREA (NON PROCESSING AREA)

Preference would be given to suitable local people for employment. However, accommodation facility for employees coming from distant places shall be provided in the colony of the cement plant.

6.3 GREEN BELT

The same has been given in point 5.2.

6.4 SOCIAL INFRASTRUCTURE

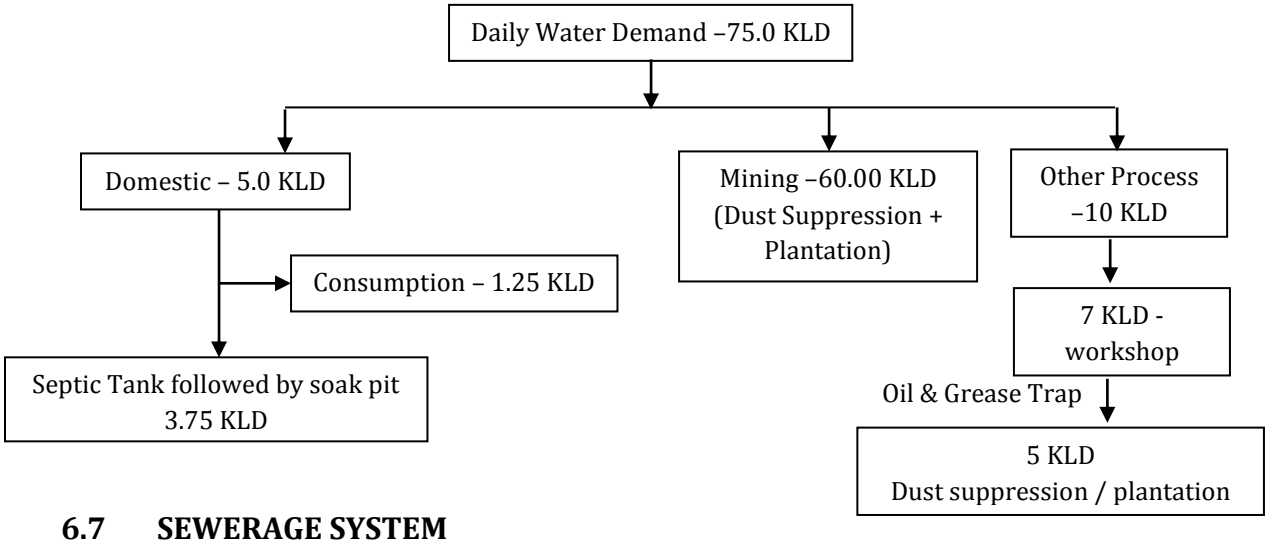
The proposed project is located in village(s) – Pagara, Jhiriya Kothar, Jhiriya Bajpain & Jhiriya Koparihan, Tehsil – Amarpatan, District – Satna (Madhya Pradesh). Preference will be given to suitable local people for employment. Further, indirect means of earnings shall be created in the area of contractual jobs, vehicle driving, shops, construction, transportation etc. Therefore, it is envisaged that the implementation of the proposed project shall have a positive impact on the adjoining society. In addition, DCBL will take various social welfare programmes in the surrounding villages.

6.5 CONNECTIVITY (TRAFFIC AND TRANSPORTATION ROAD/ RAIL/ METRO/WATER WAYS ETC.)

Given in point no. 4.0

6.6 DRINKING WATER MANAGEMENT (SOURCE AND SUPPLY OF WATER)

Total Water requirement is estimated to 75 KLD which is proposed to be met by ground water or local authorities.



6.7 SEWERAGE SYSTEM

Toilet facilities will be provided. The generated sewage will be channelized to septic tank followed by soak pit.

6.8 INDUSTRIAL WASTE MANAGEMENT

There will be no industrial waste generation due to proposed project except waste water from workshop. Waste water from workshop will be used for greenbelt and dust suppression after treated by Oil & Grease trap.

6.9 SOLID WASTE MANAGEMENT

The same has been given in point no. 3.9.

6.10 POWER REQUIREMENT AND SUPPLY / SOURCE

About 0.5 MW power will be required which will be met from Madhya Pradesh Madhya Kshetra Vidyut Vitaran Company Limited (MPMKVVCL).

7.0 REHABILITATION AND RESETTLEMENT (R & R PLAN)

7.1 POLICY TO BE ADOPTED (CENTRAL/STATE) IN RESPECT OF THE PROJECT AFFECTED PERSONS INCLUDING HOME OUSTEES, LAND OUSTEES AND LANDLESS LABOUR (A BRIEF OUTLINE TO BE GIVEN)

While granting the ML area, the state Govt. has already excluded the road, nalla, habitation and applicable statutory barriers for it.

8.0 PROJECT SCHEDULE AND COST ESTIMATES

8.1 LIKELY DATE OF START OF CONSTRUCTION AND LIKELY DATE OF COMPLETION (TIME SCHEDULE FOR THE PROJECT WILL BE GIVEN).

The project will commence once Environmental Clearance and other necessary approvals are obtained from the concerned departments for the proposed project and interlinked cement plant. ML is granted for 50 years.

8.2 ESTIMATED PROJECT COST ALONG WITH ANALYSIS IN TERMS OF ECONOMIC VIABILITY OF THE PROJECT.

The project cost towards mining is Rs. 100 million including Cost for infrastructure, tools, equipments & Mining Plan etc.

Additionally, Land cost Rs. 1000 million, Environmental protection Rs. 0.20 million and occupation health & safety Rs. 0.10 million is also envisaged for implementation of the proposed project.

ECONOMIC EVALUATION-

(i) Capital cost –

Capital Investment	
Area of investment	**Expenses (in Million Rs.)**
i Land	**1000.00**
ii. Mining	**100.00**
a. Cost for infrastructure, tools, equipments & Mining Plan etc.	**100.00**
iii. Environmental Protection	**0.20**
a. Pollution Control	**0.10**
b. Tarpaulin and cover for stack of ore	**0.10**
iv. Occupational Health & Safety	**0.10**
a. Infrastructure & PPEs	**0.10**
Total Capital Investment	**1100.30**

(II) PRODUCTION & TRANSPORTATION COSTS, ROYALTY & OTHER TAXES –

Operating/ Recurring Cost

	Area of investment	**Cost per ton (in Rs.)**
i	**Mining**	**137 /-**
a	Expenditure for infrastructure and equipment maintenance	**22 /-**
b	Salaries & Wages of 75 staffs	**10 /-**

c	Diesel and Accessories for transport including mining cost	**40 /-**
d	Royalty on Mineral & Miscellaneous Exp	**65 /-**
ii	**Socioeconomic Development**	**4 /-**
a	Corporate Social Responsibility	**4 /-**
iii	**Occupational Health and Safety**	**4 /-**
a	For routine checkup	**4 /-**
iv	**Environment Management**	**5 /-**
a	Dust Suppression & Pollution Control	**3 /-**
b	Environmental Monitoring	**2 /-**
	Total Recurring Expenditure	**150 /-**

The demand supply relation is adequate for supply. The project is economically viable based on preliminary study of cash flow forecast. The operating cost and PMV is 150 /- PMT.

Based on the feasibility study carried out, the project is considered to be viable.

9.0 ANALYSIS OF PROPOSAL

9.1 FINANCIAL AND SOCIAL BENEFITS WITH SPECIAL EMPHASIS ON THE BENEFITS TO THE LOCAL PEOPLE INCLUDING TRIBAL POPULATION, IF ANY, IN THE AREA

There will be social benefits from the mining operations. The core benefit of the proposed project is the availability of limestone for cement manufacturing. The beneficial aspects of the projects on the socio-economic environment of the area are in the areas of employment, service, trade, commerce, public utility, literacy, social awareness, health care facilities, recreation etc. The underlying benefits through the proposed project are:-

Table 22: Financial & Social Benefits

S. No.	Activities
1.	It aims to provide additional employment to the local population of the proposed study area. Direct employment: 66Approx. Indirect Employment: 50Approx.
2.	The PP proposes for sustainable development as per the Companies Act' 2013 and its subsequent notifications regarding activities enlisted under the CSR. DCBL will contribute substantially to the overall economy and social development of the area. The PP will undertake need based CSR activities annually and the same shall be detailed in the EIA/ EMP report.

The proposed project aims to continue the sustainable social development. The Project authorities are committed towards fulfilling its corporate social responsibility.

As per the preliminary site visit, the CSR activities shall be identified on the need based requirement of the study area. However after the analysis of the baseline data generation and socio – economic survey, and the public hearing, the appropriate sustainable development plan will be contributed on the basis of need based analysis.

10.0 CONCLUSION

It is predicted that socio-economic impact due to this project will positively increase the chance of more employment opportunities for local inhabitants. The revenue of the State Govt. will be definitely increasing due to the proposed activity. The entire project area is devoid of any endangered flora and fauna. It is proposed to reclaim the land and develop green cover and water reservoir in the mined out area. The impact due to mining operations in the surrounding environment shall be mitigated with implementation of proper Environmental Management plan and will be confined within the ML area. Thus, the proposed project is not likely to have any significant adverse effect on the environment or adjacent ecosystem.

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