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1 EXECUTIVE SUMMARY

1.1 Introduction and Background

The Nandgaon Flagstone mine cluster is located at a distance ~1.00 Km from Nandgaon village. The District Headquarater Mahasamund is ~8.50 km towards South – East direction and Chhatttisgarh State Capital Raipur is ~28.39 km, towards WNW direction and is connect by good tar road.

The details of necessary permit and Clearance for applied lease area are given below –

Name	Shri Prem Narayan Chandrakar	Shri Dhirendra Lonare	Shri Hirendra Sahu	Total	Annexure No.
Reference of TOR	653/Mine/Mahasamund/1609 Nawa Raipur Atal Nagar, dated 28/06/2021	655/Mine/Mahasamund/1606 Nawa Raipur Atal Nagar, dated 28/06/2021	657/Mine/Mahasamund/1614 Nawa Raipur Atal Nagar, dated 28/06/2021	-	Annexure - II
Area	0.99 hect.	1.27 hect.	1.26 hect.	3.52 hect	Annexure - 1
Khasra No.	2732 and 2738	2735/2 and 2757/1	2735/1	2732 , 2738, 2735/2 , 2757/1, 2735/1	Annexure - 1
Applied Capacity	7216.20 TPY	6156 TPY	6019.20 TPY	19391.40 TPY	Annexure - II
Village	Nandgaon	Nandgaon	Nandgaon	Nandgaon	Annexure - 1
District	Mahasamund	Mahasamund	Mahasamund	Mahasamund	Annexure - 1
LOI	Letter number 1777 / K/ Utakhani Patta/ Kha.li./ Na.Kra.67/2019 Mahasamund,dated 11/12/2020	Letter number 1756 / K/ Utakhani Patta/ Kha.li./ Na.Kra.79/2019 Mahasamund dated 03/10/2020	Letter number 1754 / K/ Utakhani Patta/ Kha.li./ Na.Kra.79/2019 Mahasamund dated 03/12/2020	-	Annexure - 1
	Extension letter no - 08/ khani 02/U.P. Anu. Nispa/ Na.kra. 50/2017(4) Nawa Raipur Dated 01/01/2022.	Extension letter no - 06/ khani 02/U.P. Anu. Nispa/ Na.kra. 50/2017(4) Nawa Raipur Dated 01/01/2022.	Extension letter no - 03/ khani 02/U.P. Anu. Nispa/ Na.kra. 50/2017(4) Nawa Raipur Dated 01/01/2022.		
NOC by Gram Panchayat	Gram Panchayat Nandgaon dated 25/01/2021	Gram Panchayat Nandgaon dated 10/11/2019	Gram Panchayat Nandgaon dated 10/11/2019	-	Annexure - IV
NOC by Forest Office	Noc of forest office Mahasamund dated 26/10/2012	Noc of forest office Mahasamund letter no.5812 dated 16/10/2019	Noc of forest office Mahasamund letter no.5810 dated 16/10/2019	-	Annexure - V

Approval letter of Mine Plan	Letter No. - 1676/ Khani 02/Ma.Pl.Anumodan/ Na.Kra.02/2019(2) Nawa Raipur dated 10/03/2021	Letter No. - 1678/ Khani 02/Ma.Pl.Anumodan /Na.Kra.02/2019(3) Nawa Raipur dated 10/03/2021	Letter No. - 1721/ Khani 02/Ma.Pl.Anumodan /Na.Kra.02/2019(1) Nawa Raipur dated 16/03/2021	-	Annexure - III
Geological Reserve	1,42,560 MT	1,82,880 MT	1,81,440 MT	5,06,880 MT	Annexure – III
Recoverable Reserve	Rejects of Farshi Pathar-3,526.02 MT	Rejects of Farshi Pathar-2964.46 MT	Rejects of Farshi Pathar-5321.86 MT	Rejects of Farshi Pathar-11812.34 MT	Annexure – III
	Farshi Pathar-66,994.38 MT	Farshi Pathar-56,324.66 MT	Farshi Pathar-1,01,115.38 MT	Farshi Pathar-224434.42 MT	Annexure – III
	TOTAL Farshi Pathar-70,520.40 MT	TOTAL Farshi Pathar-59,289.12 MT	TOTAL Farshi Pathar-1,06,437.24	TOTAL Farshi Pathar-2,36,246.76 MT	Annexure – III
Maximum Annual Mining Capacity	7216.20 TPY	6156 TPY	6019.20TPY	19,391.40 TPY	TOR Annexure – II
Cluster Area	8.73 hect	8.73 hect	8.73 hect	-	Annexure - VI
Cost of Project	15.40 lac	28.63 lac	19.14 lac	63.17lac	-

The studies were undertaken by the Consultant namely, Aseries Envirotek India Pvt. Ltd. (AEIPL) Noida. AEIPL is a National Accreditation Board for Education and Training (NABET) Accredited Consultant Organization (ACO) and is qualified to prepare EIA reports for Project / Activity 1(a) (Mining of Minerals), a mandatory requirement for agencies submitting such studies to regulators for the purpose of seeking EC.

The EIA study report has been based upon the following :-

- Field data collection on different aspects of environment including air, soil, water, land, meteorology, noise, flora, fauna, agriculture and socio-economy in the study area of 10 km radius with mine as its center.
- Study of opencast mining methodology, water requirement, source of pollutants and pollution control strategy.
- Ecological Prospective and Green Belt Development.

The EIA study evaluates the impact on the present environmental scenario and check out the environmental management plan incorporating further step to mitigate the adverse impacts of air, noise, water, land pollution on environment.

1.2 Location and Environmental setting

Table 1-1: Location and Environmental setting

<table>
<tr><th>S.No.</th><th>Particulars</th><th>Details</th></tr>
<tr><td>A.</td><td>Nature of the Project</td><td>Proposed Flagstone Mining Project of Shri Premnarayan Chandrakar, Shri Dhirendra Lonare, Shri Hirendra Sahu, in Nandgaon Flagstone mining Cluster</td></tr>
<tr><td>B.</td><td colspan="2">Size of the Project</td></tr>
<tr><td>1.</td><td>Mine area</td><td>3.52 Ha {(0.99 ha. (Shri Premnarayan Chandrakar) + 1.27 ha (Shri Dhirendra Lonare) + 1.26 ha (Shri Hirendra Sahu) }</td></tr>
<tr><td>2.</td><td>Production Capacity</td><td>19,391.40 TPA (ROM)
{ (7216.20 (Shri Premnarayan Chandrakar) + 6156.00 (Shri Dhirendra Lonare) + 6019.20 (Shri Hirendra Sahu) }</td></tr>
<tr><td>C</td><td colspan="2">Location Details</td></tr>
<tr><td>1.</td><td>Village</td><td>Nandgaon</td></tr>
<tr><td>2.</td><td>Tehsil</td><td>Mahasamund</td></tr>
<tr><td>3.</td><td>District</td><td>Mahasamund</td></tr>
<tr><td>4.</td><td>State</td><td>Chhattisgarh</td></tr>
<tr><td>5.</td><td>Toposheet No.</td><td>64K/4</td></tr>
<tr><td>D</td><td colspan="2">Environmental Settings of the Area</td></tr>
<tr><td>1.</td><td>Ecological Sensitive Areas</td><td>No protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration located within the 15 km radius of the mining lease. Forest area is aaprox 350m from applied area.</td></tr>
<tr><td>2.</td><td>River / water body</td><td>
<table>
<tr><th rowspan="2">S.No.</th><th rowspan="2">Particullar</th><th colspan="3"></th></tr>
<tr><th>Shri Premnarayan Chandrakar</th><th>Shri Dhirendra Lonare</th><th>Shri Hirendra Sahu</th></tr>
<tr><td>1.</td><td>Mahanadi River</td><td>~580 m west</td><td>~780 m, West</td><td>~710 m West.</td></tr>
<tr><td>2.</td><td>Seasonal Nalla</td><td>~80 m., West</td><td>~285 m, West</td><td>~215 m,West</td></tr>
<tr><td>3.</td><td>Village Pond</td><td>~800 m., East</td><td>~540 m, East</td><td>~630 m, East</td></tr>
<tr><td>4.</td><td>Canal</td><td>~200 m., South-West</td><td>~110 m, South</td><td>~115 m,South</td></tr>
<tr><td>5.</td><td>Reservoir</td><td>~20 km, North-east</td><td>~19.70 km, North-East</td><td>~19.80 km, North-east</td></tr>
</table>
</td></tr>
<tr><td>3.</td><td>Nearest Human Habitation</td><td>
<table>
<tr><th>Shri Premnarayan Chandrakar</th><th>Shri Dhirendra Lonare</th><th>Shri Hirendra Sahu</th></tr>
<tr><td>Nandgaon (~ 1 km, North- East direction.)</td><td>Nandgaon (~0.5 km, East direction.)</td><td>Nandgaon (~0.5 km, East direction)</td></tr>
</table>
</td></tr>
<tr><td>4.</td><td>Nearest Town / City</td><td>
<table>
<tr><td>Mahasamund (~8.50 km, East direction)</td><td>Mahasamund (~8.50 km, North - East)</td><td>Mahasamund (~8.50 km, East direction)</td></tr>
</table>
</td></tr>
</table>

S.No.	Particulars	Details		
5	National Highway	NH-53 at a distance of ~4.80 km (Bhawanipatha-Raipur road) towards north direction from mine site.	NH-53 at a distance of ~4.65 km (Bhawanipatha-Raipur road) towards north direction from mine site.	NH-53 at a distance of ~4.80km (Bhawanipatna-Raipur road) towards North direction from mine site.
6	State Highway	State Highway ~11.80 km (Mahasamund – Rajim road) towards south-east.	State Highway road ~11.50km (Mahasamund – Rajim road) towards south-east.	State Highway (Mahasamund-Rajim) road ~11.50 km towards South-East from mine site.
7.	Nearest Railway Station	Belsonda station at 4.90 km towards North	Belsonda Railway station ~ 4.70 km, North	Belsonda Railway station ~ 4.80 km, North.
8.	Nearest Airport	Raipur Airport at ~28.39 km, towards WNW direction from Mine boundary	Raipur Airport at ~28.50 km, towards NW direction from Mine bound.	Raipur Airport at ~28.64 km, towards WNW direction from Mine boundary.
9.	State Boundary	None within study area		
10.	Seismic Zone	Zone – II [as per IS 1893 (Part-I): 2002]		
D	**Cost Details**			
1.	Project Cost	**63.17 lakhs** (**15.40 lakhs** - *Shri Premnarayan Chandrakar*, ***28.63 Lakhs*** - *Shri Dhirendra Lonare* , ***19.14 Lakhs*** - *Shri Hirendra Sahu*)		
E	**Requirements of the Project**			
1.	Water Requirement	18.65 KLD		
2.	Fuel requirement	100		
3.	Man Power Requirement	25		

1.3 Project Chronology till Date

1. The details of online file for the project proposal namely Form-1 (as per the EIA Notification 2006, as amended till date) along with a Pre-feasibility Report, Approved Mining plan and proposed Terms of References (ToR) for carrying out environmental studies to the State Environment Impact Assessment Authority Chhattisgarh for the mine lease are as follows : -

Sr.No	Lessee	Date of submission
1	**Shri Premnarayan Chandrakar**	**15/03/2021**
2	**Shri Dhirendra Lonare**	**15/03/2021**
3	**Shri Hirendra Sahu**	**17/03/2021**

2. Details regarding First technical presentation made are as given below :-

Sr.No	Lessee	No. of SEAC meeting	Date of Presentation
1	**Shri Premnarayan Chandrakar**	372th	29/05/2021
2	**Shri Dhirendra Lonare**	372th	29/05/2021
3	**Shri Hirendra Sahu**	373th	31/05/2021

3. The details of TOR granted are as follows :-

Sr.No	Lessee	TOR Letter No	Date
1	**Shri Premnarayan Chandrakar**	653/Mine/Mahasamund/1609 Nawa Raipur Atal Nagar, dated	28/06/2021
2	**Shri Dhirendra Lonare**	655/Mine/Mahasamund/1606 Nawa Raipur Atal Nagar, dated	28/06/2021
3	**Shri Hirendra Sahu**	657/Mine/Mahasamund/1614 Nawa Raipur Atal Nagar,	28/06/2021

1.4 Project Description

1.4.1 Study Area at a Glance

The study area is taken in accordance with the provisions of sector specific EIA guidance manual for Mining of Minerals manual, published by Ministry of Environment and Forests, during 2010. The study area for the Farshi Patthar Mining Project was as follows:

- The proposed project area (M. L. area) is considered as ‘Core Zone’.
- 10 km radius from the boundary limits of the M.L. area is considered as ‘Buffer Zone’.

1.4.2 Utilities

Table 1-2: Water Requirement for the mining

Sr. No.	Usage	Water Requirement			Total Water Requirement
		Shri Premnarayan Chandrakar	Shri dhirendra Lonare	Shri Hirendra Sahu	
1.	Domestic Purpose @25 lpd/worker	225 L/Day (For 9workers) Say 0.23 KLD	200 L/Day (For 8 workers) Say 0.20 KLD	200 L/Day (For 8 workers) Say 0.20 KLD	0.63 KLD
2.	Stone Cutting/ Wet cutting	(Same Water is used through recycling) 2.00 KLD	(Same Water is used through recycling) 2.00 KLD	(Same Water is used through recycling) 2.00 KLD	6.00 KLD
3.	Dust Suppression @ 0.5 L/Sqm (twice a day)	2 KLD (500m x 4m=2000sqm)	2 KLD (500m x 4m=2000sqm)	2 KLD (500m x 4m=2000sqm)	6.00 KLD
4.	Greenbelt Development@ 2.5 L/tree	1.69 KLD (674 trees)	2.64 KLD (1456Trees)	1.69 KLD (676 Trees)	6.02 KLD
Total		**5.92 KLD**	**6.84 KLD**	**5.89 KLD**	**18.65 KLD**

1.4.3 Topography and Drainage

The topography of the area is Flat land. The stone is buried under the soil in the entire lease area. The general slope is towards west. Maximum Altitude of the applied area is ranging from 271-272 m AMSL while lowest side is 270 m AMSL at. The applied area is devoid of any vegetation.

At present there is no water source, which is passing through the lease area and its surrounding. Proper care will be taken at the time of mining.The distance of water bodies from applied mines given below :-

S.No.	Particullar	Applied Mines		
		Shri Premnarayan Chandrakar	**Shri Dhirendra Lonare**	**Shri Hirendra Sahu**
1.	**Mahanadi River**	~580 m, west	~780m, West	~710m west.
2.	**Nalla**	~80 m., West	~285 m, West.	~215 m,West
3.	**Village Pond**	~800 m., South-west	~540 m, East	~630 m,East
4.	**Canal**	~200 m., South-West	~110 m, South	~115 m,East
5.	**Reservoir**	~20km, North-east	~19.70 km, North-East	~19.80 km, North-east

1.4.4 Local Geology

The applied area forms a part of the Charmuria Formation of Raipur Group of Chhattisgarh Supergroup of Meso to Neo Proterozoic age comprises of fractured Limestone. The sequence of formation is as follows:-

Meso to Neo Proterozoic	**Chhattisgarh Supergroup**	**Raipur Group**	**Charmuria Formation**	**Purple limestone, dark grey bedded fractured limestone**

1.4.5 Mineable Reserve & Life of Mine

Table 1-3: Reserve Estimation

Reserve	Shri Prem Narayan Chandrakar	Shri Dhirendra Lonare	Shri Hirendra Sahu	Total
1)GEOLOGICAL RESERVE **Less::**	**1,42,560.00 MT**	**1,82,880.00 MT**	**1,81,440.00 MT**	**506,880.00 MT**
i) Reserve Blocked undermine boundary	46,641.60 MT	74,491.20 MT	46,123.20 MT	1,67,256.00 MT
ii) Reserve Blocked under Benches & Slope maintenance	21,686.40 MT	24,062.40 MT	23,277.60 MT	69,026.40MT
iii)Reserve blocked under no	-	21,916.80 MT	--	21,916.80

mining zone				MT
2) **MINEABLE RESERVE** (1 - i – ii-iii) Less	**74,232.00 MT**	**62,409.60 MT**	**1,12,039.20 MT**	**2,48,680.80 MT**
iv) Mine Loss v) Stone in the form of rejected Farshi Pathar	3,711.60 MT 3,526.02 MT	3,120.48 MT 2,964.46 MT	5,601.96 MT 5,321.86 MT	12,434.04 MT 11,812.34MT
3) RECOVERABLE RESERVE (2 – iv-v)	**66,994.38 MT**	**56,324.66 MT**	**1,01,115.38 MT**	**2,24,434.42 MT**
4) TOTAL RECOVERABLE RESERVE OF STONE (3+ v)	**70,520.40 MT**	**59,289.12 MT**	**1,06,437.24 MT**	**2,36,246.76 MT**
5) TOP SOIL TO BE GENERATE	**19,983.00 CUM**	**18,015.00 CUM**	**28,191.00 CUM**	**66,189 CUM**

1.5 Life of Mine

Table : Life of Mine

	Particular	**Shri Premnarayan Chandrakar**	**Shri Dhirendra lonare**	**Shri Hirendra Sahu**
A)	Estimated Recoverable Reserves	29,383.50cum or 70,520.40 tons	24,703.80 cum. or 59,289.12tons	44,348.85cum 0r 10,6437.24 tons
B)	Average rate of production per year during Five year plan	2,969.7 cum. or 7,127.28 tons	2,485.2cum or 5,964.48 tons	2,488.05cum 0r 5,985 tons
C)	Expected rate of production after five year plan	2,907 cum. or 6,976.8 tons	2,455.56 cum or 5,893.34 tons	2,493.75 cum or 5,985 tons
D)	Sanctioned Granted period	30 year from the date of lease agreement	30 year from the date of lease agreement	30 year from the date of lease agreement
E)	Plan period	10 years	10 years	10 years
F)	Thus anticipated life of the quarry	About 10 years. (Up to 9m of mine depth from surface level)	About 10 years. (Up to 9m of mine depth from surface level)	About 10 years. (Up to 9m of mine depth from surface level)

1.5.1 Mining Method

Method of mining will be opencast mining method. Mode of working will be manual. Only Top soil will be removed by excavator and cutting of stone on the stone layer on mine surface will be done by stone cutter rest all the other operations like excavation and sizing etc. will be done manually by local labors by hardened chisels. Loading of sized stone on tractors will be done manually with the help of local labors. Transportation of flagstone will be done manually with the help of local labors. Transportation of flagstone will be done by tractors. Hand Broken stone chip will also be loaded on tractors manually. The gradient of the ramp with benches will be maintained to 1:15 i.e. 15 meter long ramp for every 1 meter of depth. Width of ramp will be 3 meter.

Width of benches will be maintained similar to height of benches. The quarry will be developed in 3 benches of 3m height x 3 m width each out of which first benchwill be of top soil and third bench will be of flagstone i.e last bench of 3 m height only. However during advancement of mining operation the mine will be worked into 1.5 m -1.5 m height of sub-benches. Finally at mine boundary benches will be converted to 3m (H) X 3m (W).

Table: Extent of Opencast Mechanized

S. NO.	NAME OF MACHINERY	NUMBER		
		Shri Prem Narayan Chandrakar	**Shri Dhirendra Lonare**	**Shri Hirendra Sahu**
1.	Tractor	1	1	1
2.	Water Tanker with water sprinkler	1	1	1
3.	Dewatering Pumps	1	1	1
4.	Stone cutter	1	1	1

1.6 Meteorology Long Term Meteorology (Secondary Data)

Information presented in subsequent paragraphs is from the Indian Meteorological Department (IMD) Raipur, Long Term Climatological Tables, 1971-2000. These tables give useful information about a region's weather, since it was collected over a period of 30 years.

1.6.1 Temperature

The average ambient temperature remains 26.2°C, varies from 15.5°C to 45.7°C. The minimum - maximum temperature range is 29.5 - 49 °C in summer and 8 - 25 ° C in winter. The average relative humidity remains around 62.6%, varies from 15.4% to 99.2%. The station pressure varies from 974 hPa to 960 hPa, averaged around 987 hPa..

1.6.2 Wind

Long- term wind direction data indicates that the predominant wind during the study period (15th March to 15th June)-2021 is SW and second predominant wind direction is W

1.6.3 Rainfall

The annual rainfall in the district is around 1258 mm. The rainfall increase slightly from South to North. Out of the total annual rainfall, 90% occurs in SW monsoon in-between 15th June to 15th August. Due to the sub-tropical climate the maximum temperature ranges between 33.8 to 44.2°C where as humidity varies from 35% and 85%.

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1.6.4 Relative Humidity

Most humid conditions were found in the monsoons, followed by post-monsoons, winter and summer in that order. Mornings were more humid than evenings and humidity ranged from a high of 88-82% in monsoon mornings to a low of 53-34% in summer evening

1.6.5 Site Specific Meteorology

Baseline meteorological data representing the summer season 2021 (15^{th} March to 15^{th} June) was collected near project site

Meteorological data showed that the average wind speed during the study period was observed to be 6.01 m/sec. It was observed that during study period wind blows pre dominantly from South West and Second pre dominant direction is W. The data obtained during the study period was compiled to obtain average data.

1.7 Existing Environment Scenario

1.7.1 Land Use

Land Use of the Study Area

The land use land cover map of the study area has been prepared using recent Landsat satellite image, area and distance calculations have been carried out using GIS software after geo- referencing and interpretation.

1.7.2 Soil Quality

The soils of study area are predominantly Sandy loam in texture. The pH of the soil is ranges from 7.32 to 8.15. The soil being of friable consistency, the bulk density of the soil is in the range of 1.32 to 1.48 g/cm3. The organic carbon content of the soil samples varies from 0.27 to 0.38 mg/100g.

1.7.3 Ambient Air Quality

The above analysis report shows that since this mine is not operating and traffic on the National Highway is also less, population in the village is not more. The baseline ambient air quality was found to be within the permissible limits of NAAQS.

1.7.4 Noise

Day time Noise Levels (Leq day)

- The day time (Leq day) noise levels observed in the range of 40.2 to 48.4 dB (A) in study area which is within the prescribed limit of 55 dB (A).
- The day time (Leq day) noise levels at mine site observed as 57.9 to 58.8 dB (A) in study area which is within the prescribed limit of 75 dB (A). (In Mine Site Areas)

Night time Noise Levels (Leq night)

- The night time (Leq night) Noise levels observed in the range of 38.1 to 42.4 dB (A) which is within the prescribed limit of 45 dB (A) in study area.
- The night time (Leq night) Noise levels at mine site were observed in the range of 46.1 to 47.4dB (A) which is within the prescribed limit of 70 dB (A). (In Mine Site Areas)

1.7.5 Water Environment

Groundwater Quality

The analysis results shows that the pH for the ground water samples GW1, GW2,GW3,GW4,GW5 and GW6 ranged from 7.28 to 7.69 indicating slightly alkaline in nature. The TDS (Total Dissolved Solids) were found to be in the range 532 mg/l to 589 mg/ l which is within the permissible limit of 2000 mg/l. Total Hardness of Ground water samples in the study area was found to be 251-272 mg/l which is within permissible limit. Alkalinity indicates better buffering capacity of water and ranges between 149-162 mg/l.

Fluoride content varies from 0.62 mg/l – 0.82 mg/l which is within permissible limit. The overall ground water quality in the study area was found to be mineralized with respect to total dissolved solid, chloride (82.0 mg/l to 97.0 mg/l), sulphate (38.0 mg/l to 43.0mg/l) and hardness.

Surface Water Quality

Surface water samples were collected, and analyzed, pH value was found to be 7.52 to 7.62 mg/l which indicate that surface water is alkaline in nature; TDS was found to be 261 to 269 mg/l. Dissolve oxygen were found about 6.3 and 6.5 mg/l. It is seen that the physicochemical analysis of other parameters like chloride, calcium, magnesium, nitrate and fluoride were found within the desirable limit. The overall surface water quality of the available sources within the study area was found to be good physico-chemically with respect to all the parameters. There is no organic load-observed in the sources monitored indicating no pollution load in the source Biological Environment

Ecological study is essential to understand the impact of industrialization and urbanization on existing flora and fauna of the study area.

There is no wildlife sanctuary, National park, Biosphere reserve, Wildlife corridors, Tiger/ Elephant reserve within 10 km radius of the mining lease.

1.7.6 Socio Economic Status

The study area includes 20 villages within the 10 km. radius with a total population 38,829 as per census 2011. As per census 2011, about 14,370 of the total are main workers, 3,802 are marginal workers.

1.7.7 Impact on Air Environment

- Water sprinkling will be done twice during the day in summer season and once during the day in winter season for settling of dust particles.
- Transportation of mineral will be done on Kaccha road which will generate dust and rest of the distance will be on State Highway will not cause air pollution.
- Regular maintenance of machinery and vehicles will be done to check the excess emissions. A system of regular overhauling of dumpers & excavators, after specified hours of working shall be evolved and observed to avoid generation of obnoxious fumes.
- Green belt with tall trees will be planted. It will restrict the particulates and reduce the concentration of SO_2 and NO_2.
- Plantation along Kaccha road and statutory barrier etc. will also protect the soil from wind erosions.
- All the haulage roads including the main ramp to mine pit will be kept properly maintained and watered regularly during the working shift to prevent generation of dust due to the movement of dumpers, water tankers etc.
- Dust mask shall be provided to the workers engaged at dust generation points like excavations and loading points.

1.7.8 Impact of Traffic Density :

Traffic analysis is carried out by understanding the existing carrying capacity of the roads near to the project site and the connecting main roads in the area. Existing traffic on these roads was compared with the carrying capacity of these roads as per IRC guidelines and it was found that the roads are capable of handling the additional traffic/load.

Table 2.13: Comparison Carrying Capacity of Road in Existing &Proposed PCU

Location	Existing Traffic Load			Total Traffic load including applied project		
	No of PCUs	V/C	LoS	No of PCUs	V/C	LoS
Project site to Belsonda – Bamhani PMGSY Road	600.50	0.300	**B**	672.50	0.336	**B**

**LOS- Level of Services*

1.7.9 mpact on Noise Environment

The expected noise levels in the working environment are compared with standards prescribed by occupational safety and health administration (OSHA-USA) & CPCB-NEW DELHI, the noise levels are expected to be in the acceptable range.

1.7.10 Impact on Water Environment

Impact on Surface Water Quantity

Surface water will not be utilized and impact on surface water quantity is not anticipated due to the proposed activity.

Impact on Surface Water Quality

The proposed opencast mining operation may cause water pollution. The sources of pollution generally are:

- Wash off from dumps
- Soil Erosion

Mitigation Measures

In open cast mining pits as well as on dumps, it is necessary that the rainwater falling outside the edge limit of the working areas will not be allowed to enter into the pit and working areas. Therefore it is proposed to develop garlands drains around the mining pits and dumps to arrest the surface runoff water and divert it to lower synclines without any contact with the mining operations.

In the lease for proper drainage of water, a set of garland drainages will be made in the mining lease area and the water will be accumulated at the lower most gradient by constructing siltation tanks which will act as water storage in the area as well as collection of silts. Silts will be regularly cleared regularly.

Impact on Groundwater Quantity

As evident from nearby wells, as well as also by villagers during the summer water table goes down below 35.0 meter and in rainy season water table comes up within 32.0 meter. Since the water table is below the maximum excavation depth (9m) of operation in and the flow or extent of nearest hydrology is too far from the proposed lease area thus no impact can be assessed on water table, water flow or hydrology. Moreover no sewage or other effluents will be generated from the mine closure activities which are required to be discharged on water. Hence no water pollution can be assessed

1.7.11 Impact on Flora and Fauna

As the mining activities will be confined to core zone only, no adverse impact is foreseen on the flora & fauna in the core zone. To prevent the entry of wildlife animals from entering the lease area proper fencing will be done all around the lease area.

1.7.12 Impact on Top Soil

During mining of flagstone top soil will be generated and will be used for plantation.

1.7.13 Impact on Socio Economic Status

Socio-economic survey was conducted in six villages within the study area located in all directions with reference to the project site.

The respondents were asked for their awareness/opinion about the project and their opinion about the impacts of the project, which is an important aspect of socio-economic environment, viz. job opportunities, education, health care, transportation facility and economic status.

1.8 Environment Monitoring Program

The monitoring of pollutant in mine will be carried out for air, water, soil and noise. It takes care of all monitoring needs of the mine. Additionally ambient air and work zone monitoring in mine will be conducted in every season near mining operation, loading and transportation (haul road) areas by Government approved private agency. The analysis results of air monitoring will be properly recorded and submitted to the statutory authorities from time to time. Noise measurement of mine equipment will be done Twice in a year, ambient air monitoring will be done twice in year. Water quality monitoring will be done once in season at two locations & soil quality monitoring will be done once in a year at 2 locations within the study area. A total of Rs. 1.26 lakhs/- every year will be spent on monitoring of environmental parameters.

1.9 Additional Studies

1.9.1 Risk Assessment and Disaster Management Plan

The following natural /industrial problems may be encountered during the mining operation are:

- Inundation-filling of the mine pit due to excessive rains.
- Slope failures at the mine faces or stacks.

Water table will not be encountered during proposed working. No high risk accidents like landslides, subsidence flood etc. have been apprehended. But possibility of accidental disaster is also not ruled out. Therefore, all the statutory precautions will be taken for quick evacuation as per the Mines Act 1952, the Mines Rules 1955, Rule of MMR- 1961 and the Rules of MCDR-1988.

1.10 Environment Management Plan

The environment management plan is prepared with a view to facilitate effective environmental management of the project. Apart from having an Environmental Management Plan, environment management cell consisting of mines manager, safety officer and environmental officer is constituted. About 8.2 lakh of capital cost and 14.9 lakh per year recurring cost would be spent on environment management activities.

1.11 Project Benefits

The surrounding inhabitants around the mine lease area are mainly agricultural oriented. Opportunities for jobs activities will be created and mining will serve as a source of permanent livelihood. The mine will create employment directly or indirectly. Additional, certain works like transportation will be outsourced on contract. So, overall effect of mining is expected to be positive.