EXECUTIVE SUMMARY OF
DRAFT ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PLAN
FOR
MUDHENA FLAGSTONE QUARRY,
TOTAL MINE LEASE AREA- 3.31 Ha.
TOTAL AREA OF MUDHENA MINE CLUSTER - 17.83 Ha.

TOTAL PRODUCTION OF MINE LEASE AREA –5669 CUM/Year

S,No	Applicant Name	Village	Khasra No	Area (Ha)	Production (cum/annum)/TPA
1	Shri Awadh Ram Sonwani	Mudhena	333/1	0.55	3644 cum/annum or 9110 TPA
2	Shri Virendra Singh Thakur	Mudhena	13,14,15,16,17, 18,21/1,21/2,2 2,23,24,25,26,2 7,28,29,31,32,3 3,34,35 and 36	2.76	2025 cum/annum
TOTAL				**3.31**	**5669 cum/annum**

AT

Village Achholi, Tehsil & District Mahasamund, Chhattisgarh

Project Activity - Mining of Minerals 1(a) (i)

Project Category – B1

MONITORING PERIOD- MARCH 2024 to MAY 2024

1. Shri Awadhram Sonwani ToR Letter No. 46/S.E.A.C.C.G./Mine/2208 Nawa Raipur Atal Nagar dated 03/04/2023
2. Shri Virendra Singh Thakur ToR Letter No. 2007/S.E.A.C.C.G./Mine/2057 Nawa Raipur Atal Nagar dated 30/11/2023

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Address: C-88, Sector 65, Noida -201301 – U.P,

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EXECUTIVE SUMMARY

Project Proposal

"**Mudhena Flagstone Quarry**" Mine comes under located at Village Mudhena, Tehsil- Mahasamund, District- Mahasamund, Chhattisgarh

Project Proponent

Shri Awadh Ram Sonwani (Proprietor) & Shri Virendra Singh Thakur (Proprietor)
Village Mudhena, Tehsil- Mahasamund,
District Mahasamund, C.G. Pin Code- 493445

Location of the applied area

Village & Tehsil	Village-Mudhena, Tehsil-Mahasamund
District & State	District-Mahasamund, Chhattisgarh
Extent of the ML area	0.55 Ha and 2.76 Ha Govt. & Private land
Survey of India Map No.	64 K/04 & 64 G/16

Latitudes & Longitudes

Pillar No	Latitude	Longitude
A	21° 8'54.71"N	82° 0'44.83"E
B	21° 8'53.02"N	82° 0'44.09"E
C	21° 8'54.13"N	82° 0'42.47"E
D	21° 8'54.31"N	82° 0'42.57"E
E	21° 8'55.41"N	82° 0'40.94"E
F	21° 8'56.70"N	82° 0'41.40"E
Pillar No	**Latitude**	**Longitude**
1.	21° 9'7.99"N	82° 0'56.38"E
2.	21° 9'9.12"N	82° 0'56.87"E
3.	21° 9'10.44"N	82° 0'56.80"E
4.	21° 9'11.94"N	82° 0'57.58"E
5.	21° 9'11.79"N	82° 0'59.31"E
6.	21° 9'11.45"N	82° 1'59.77"E
7.	21° 9'11.35"N	82° 0'59.23"E
8.	21° 9'11.63"N	82° 0'59.25"E
9.	21° 9'11.63"N	82° 0'58.19"E
10.	21° 9'11.14"N	82° 0'58.22"E
11.	21° 9'11.00"N	82° 1'0.39"E
12.	21° 9'10.39"N	82° 1'1.54"E
13.	21° 9'9.70"N	82° 1'2.50"E
14.	21° 9'9.15"N	82° 1'2.16"E
15.	21° 9'8.08"N	82° 1'2.88"E
16.	21° 9'7.84"N	82° 1'2.58"E
17.	21° 9'7.45"N	82° 1'4.04"E
18.	21° 9'7.13"N	82° 1'4.00"E
19.	21° 9'6.99"N	82° 1'4.31"E
20.	21° 9'4.57"N	82° 1'3.69"E
21.	21° 9'4.62"N	82° 1'0.68"E
22.	21° 9'5.87"N	82° 1'0.64"E
23.	21° 9'5.87"N	82° 1'1.98"E
24.	21° 9'6.35"N	82° 1'2.09"E
25.	21° 9'6.71"N	82° 1'0.71"E

	26.	21° 9'7.35"N	82° 1'0.81"E
	27.	21° 9'7.55"N	82° 0'59.68"E
	28.	21° 9'7.01"N	82° 0'59.55"E
	29.	21° 9'6.65"N	82° 1'0.55"E
	30.	21° 9'5.89"N	82° 1'0.50"E
	31.	21° 9'6.69"N	82° 0'58.04"E
	32.	21° 9'7.53"N	82° 0'58.22"E
Transport Network			
Nearest City/ Town	Mahasamund 8.44 km in SE Direction from Shri Awadh Ram Sonwani (0.55 Ha) Mahasamund 8.07 km in SE Direction from Shri Virendra Singh Thakur(2.76 Ha)		
Nearest Railway station	Belsonda Railway Station -2.45 Km in NE direction from Shri Awadh Ram Sonwani (0.55 Ha) Belsonda Railway Station -1.83 Km in NE direction from Shri Virendra Singh Thakur (2.76 Ha)		
Nearest Airport	Swami Vivekananda Airport approx 27.85 km in NW direction from Shri Awadh Ram Sonwani (0.55 Ha) Swami Vivekananda Airport approx 28.83 km in NW direction from Shri Virendra Singh Thakur(2.76 Ha)		
Archeological Place	No Archeological place in the study area.		
National Park, Wild Life Sanctuary, Wild Life Corridors, Biosphere Reserves, Protected Forest , Migratory routes for Birds etc. within 10 Km radius study area	No National Park, Wild Life Sanctuary, Wild Life Corridors, Biosphere Reserve, Protected Forest, Migratory routes for Birds etc with in 10 km radius of the study area.		
Reserve Forest and Protected Forest within 10 Km radius	No any Reserved / Protected Forest within 10 km radius.		
Water bodies within 10km radius	Mahanadi River at 0.18 km in West direction from Shri Awadh Ram Sonwani (0.55 Ha) Mahanadi River at 0.35 km in West direction from Shri Virendra Singh Thakur(2.76 Ha)		
Mining Details (Awadh Ram Sonwani (0.55 Ha)			
Geological Reserves	71940 Cum (179850 tons)		
Production Capacity, cum/annum	3644 Cum (9110 Tons)/annum		
Method of Mining	open cast manual mining method		
Total Project Cost	Rs. 56,64,510/-		
Cost for Environmental Protection Measures	Capital Cost-Rs. 84,296/- Recurring Cost-Rs.58,971/-		

Mining Details (Shri Virendra Singh Thakur(2.76 Ha)	
Geological Reserves	272706 Cum
Production Capacity, cum/annum	2525 Cum/annum
Method of Mining	open cast manual mining method
Total Project Cost	Rs. 1,07,16,788
Cost for Environmental Protection Measures	Capital Cost-Rs. 4,23,160/- Recurring Cost-Rs.295,995/-

1.0 Introduction

The proposed **"Flagstone Quarry"** Mine comes under located at Village Mudhena, Tehsil-Mahasamund, District Mahasamund, Chhattisgarh, The proposed Flagstone production capacity from the mine lease is 3644 cum/annum or 9110 TPA belongs to Shri Awadh Ram Sonwani. The lease for mining of Flagstone over an area of 0.55 Ha. and the proposed Flagstone production capacity from the mine lease is 2025 cum/annum belongs to Shri Virendra Singh Thakur. the lease for mining of flagstone over an area 2.76 ha. was granted by the Government of Chhattisgarh.

The Mine Plan for the five year was approved by directorate of geology and mining Chhattisgarh, Raipur vides letter No. 4076/khani 2/Mi. Plan. Approved/S.No./2019(1) Nawa Raipur dated 8th august, 2022 belongs to Shri Awadh Ram Sonwani and Mine Plan for the Five year was approved by directorate of geology and mining Chhattisgarh, Raipur vides letter No. 733/khani 2/Mi. Plan. Approved/S.No. 02/2019(5) Nawa Raipur dated 31th January, 2023 belongs to Shri Virendra Singh Thakur. As per the EIA notification of Ministry of Environment Forests and Climate Change, Government of India (MoEF&CC), dated 14thSeptember, 2006, as amended from time to time. this project falls under category 'B' project, activity 1(a) of EIA Notification (due to cluster of mine lease area is more than 5 ha.), an Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) is required for obtaining Environmental clearance based on TOR as approved by the statutory authority, the TOR was granted by State Environment Impact Assessment Authority vide letter No. 46/SEAC,CG./Mine/2208 Nawa Raipur Atal Nagar dated 03/04/2023. & 2007/SEAC,CG./Mine/2057 Nawa Raipur Atal Nagar dated 30/11/2023.

This EIA has been prepared as per the Terms of Reference granted and the EIA Notification. Further to assess the impact on environment, it is necessary to ascertain present status of environment prevailing at the project site and proposed operation including identification and Assessment of impact on the environment.

Keeping these points and statutory requirement in view, this Environment Impact Assessment Report and Environmental Management Plan (EMP) (here in after described as the EIA/EMP Report) has been prepared. Environmental Study has been carried out within 10 km radius of the mine area over a period of **MARCH 2024 to MAY 2024**

1.1 Need for the Project

Minerals are the chief source of present phase of industrialization and play an important role in the present phase of the national economy and overall development of the nation. The Flag Stone slabs

produced from the quarry will be supplied for the purpose of slab cuttings and then it will be sold to end user for construction purpose, at present due to growing fashion of ceramic tiles in rural area also, the demand of the flag stone is reduces, therefore the quarry management is focused on the by product as khanda and kattal which is being generated during the flag stone cutting.

2.0 Topography and Drainage Pattern

1. Shri Awadh Ram Sonwani

Topography: The area is almost a flat terrain with devoid of vegetation. It is about 400 m from the village Mudhena which is situated in the west direction. The maximum elevation is about 266 m from M.S.L.

Drainage Pattern: Mahanadi River is present at about 180 m in west direction from the lease area. The drainage pattern is dendretic to sub dendretic.

2. Shri Virendra Singh Thakur

Topography: The area is almost a flat terrain with devoid of vegetation. It is about 500 m from the village Mudhena which is situated in the west direction. The maximum elevation is about 268 m from M.S.L.

Drainage Pattern: Mahanadi River is present at about 380 m in west direction from the lease area. The drainage pattern is dendretic to sub dendretic.

2.1 Geology

The area around Mudhena village comes under Charmuria Formation of Raipur Group of Chhattisgarh Supergroup. Charmuria formation comprises of Phosphatic limestone with shale inter-beds, cherty limestone and phosphatic dolomite, chert-shale inter-beds.

The area showing a nature and extent of the mineral body.

The area around Mudhena which is situated in Tehsil Mahasamund is covered by limestone of Charmuria formation of Raipur Group of Chhattisgarh Supergroup. This mineral body is homogeneous in nature. On the basis of detailed geological mapping, study of nearby pits etc of the area and lithology of the area following sequence can be established:

Soil

Limestone (Flagstone)

2.2 Reserves

(i) Awadh Ram Sonwani (0.55 Ha)

The reserves are calculated based on the following parameter:

Geological Reserves

The reserve of flagstone has been estimated by the area of influence method.

A. Geological Reserves

Area (m^2) x depth = Volume (m^3)

4180 x 15 = 62700m^3

Geological Reserve under pit= 1320m^2x 7m = 9240m^3

Total Geological Reserves = 71940 m^3

B. Blocked Reserves

Blockage Reserves in 7.5mts Barrier Zone**= 28970m^3**

Blockage Reserves in the Benches **= 24750m^3**

Total Blockage Reserves= 53720m^3

C. Mineable Reserves = (Geological reserve- Blocked reserve)

=71940- 53720

=18220 m^3x90%= 16398m^3.

Anticipated Life of Mine:

The lease period is valid for 30 years and anticipated life of mine will be approx. 5 years.

(Source- Approved mine plan)

(ii) Shri Virendra Singh Thakur (2.76 Ha)

1098 m2 area is already excavated up to 3.0 m depth below soil cover and rest area is flat terrain with devoid of vegetation. Soil thickness is about 0.5 m. For computing the reserve of flagstone in the quarry area, volumetric method of reserve calculation is adopted taking depth10m.

A. Geological Reserves of Flag Stone as on date on fresh land

Area (m^2) x depth = Volume (m^3)

26502 x 10 = 265020 m^3

B. Geological Reserves below working pit

Area (m^2) x depth = Volume (m^3)

1098 x 7 = 7686m^3

Total Geological Reserves = 272706m^3

B. Blocked Reserves

Blockage Reserves in 7.5mts Barrier Zone**= 78514m^3**

Blockage Reserves in the Benches **= 36921m^3**

Reserve Blocked in Pit Limit**= 7545m^3**

Total Blockage Reserves= 122980m^3

C. Mineable Reserves = (Geological reserve- Blocked reserve)

=272706- 122980

=149726m^3.

Recoverable Reserves =149726x0.25 (25% Mining Loss)

=112294.5 m^3

Anticipated Life of Mine:

The anticipated life of mine will be approx. 74 years. (Upto depth of 10m).

(Source- Approved mine plan)

2.3 Method of Mining:

Quarrying will be carried out by manually open-cast method adopting a system of benches maintaining it to 1.5m as per rule 61(2)(ii) of Chhattisgarh Minor Mineral Rule, 2015. Manual labors are also deployed for quarrying and handling quarrying waste. Flagstones will be loaded by labors into trucks and tippers. Truck/tipper will be used for loading and dumping of Flagstone.

In the instance matter the depth of Flagstone has been considered 6m from general surface for the calculation of reserves. The proposed method of quarrying will be open cast.

Table 1 Year Wise Production(Awadh Ram Sonwani (0.55 Ha)

Year	Area (sq.m.)	Depth (m)	Total Volume (m^3)
1st Year	2090	3	6270
2nd Year	1570	3	4710
3rd Year	1010	3	3940
	910	1	
4th Year	820	3	2460
5th Year	280	3	840
Total			**18220**

Table 2 Year Wise Production(Shri Virendra Singh Thakur(2.76 Ha)

Year	Area (sq.m.)	Depth (m)	Total Volume (m^3)
1st Year	1350	1.5	2025
2nd Year	1350	1.5	2025
3rd Year	1350	1.5	2025
4th Year	1350	1.5	2025
5th Year	1350	1.5	2025
Total			**10125**

Table 3 Proposed Soil Production for Five Year Period

Year	Depth of Pit (mRL)	Area (sq.m.)	Volume (m^3)
1st Year	0.5 m	6870	3435
Total		**6870**	**3435**

3.0 Baseline Data, Impact Assessment and Management Plan

The EIA report incorporates one season data generated for a period from **March 2024 to May 2024.** A summary of the same is presented below:

3.1 Meteorology

Site Specific meteorological data is given in **Table4** and wind rose is given in **Figure 1.**

Table 4: Site Specific Meteorological Data

Month	Temperature °C		Wind Speed (Km/Hr)
	Min	Max	Average
March 2024	23	38	9.8
April 2024	28	42	12.5
May 2024	30	40	13.8

Source: Meteorological at station site

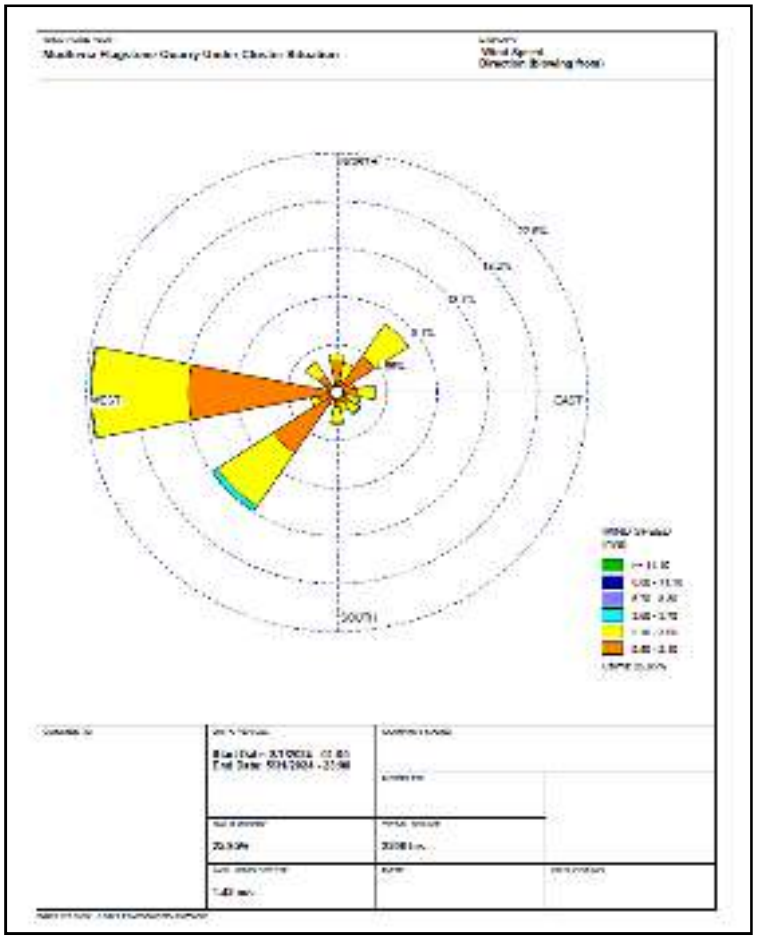

Figure 1: Wind Rose

3.2 Ambient Air Quality Status

The status of ambient air quality within the study area was monitored for the period of during **March 2024 to May 2024** at 12 locations including the Plant area and in nearby villages. Total 12 sampling locations were selected based on the meteorological conditions considering upwind and downwind directions. The levels of Respirable Particulate Matter (PM_{10}), Fine Particulates ($PM_{2.5}$), Sulphur Dioxide (SO_2,) and Oxides of Nitrogen (NO_X) were monitored. The minimum and maximum values of monitoring results are summarized in **Table 5.**

Table5: Summary of Ambient Air Quality Results

Code	Location	Distance (Km)	Direction
AQ-1	Project Site (Awadhram)	---	
AQ-2	Project Site (Virendra Singh Thakur)	---	
AQ-3	Belsonda	3.30 Km	East
AQ-4	Bemcha	7.85 Km	East
AQ-5	Nisda	1.92 Km	West
AQ-6	Brahmni	4.80 Km	SE
AQ-7	Bhalera	9.00 Km	SW
AQ-8	Paraswani	6.20 Km	NE
AQ-9	Odka	7.22 Km	West
AQ-10	Paragaon	3.45 Km	NW
AQ-11	Nandgaon	3.31 Km	South
AQ-12	Acchhradih	7.63 Km	NE

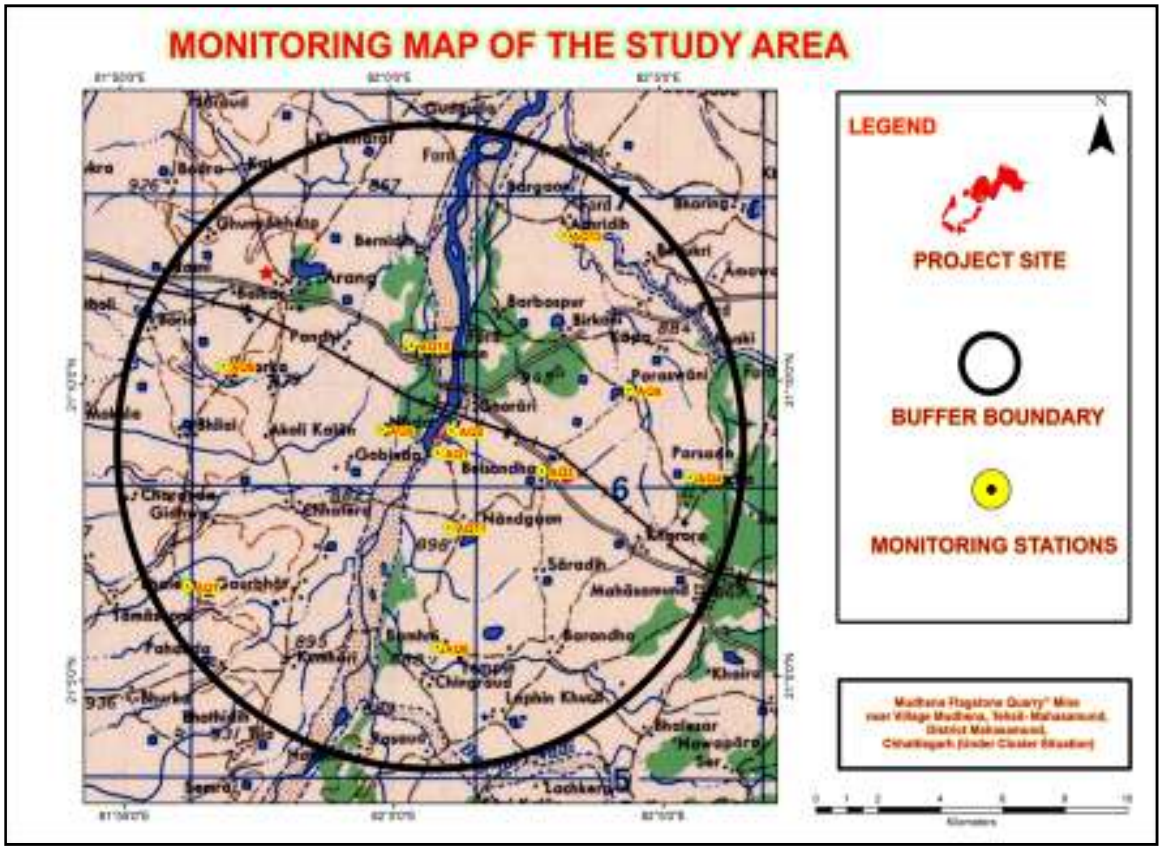

Fig 2 :Ambient Air Quality Monitoring Map

Table-6: Ambient Air Quality in the Study Area PM2.5

Location Code	PM2.5 (µg/m^3)				
	Location	**Min**	**Max**	**Average**	**98th Percentile**
AAQ1	Project Site (Awadhram)	38.52	***49.48***	45.17	48.84
AAQ2	Project Site (Virendra Singh Thakur)	36.11	48.78	44.59	48.64
AAQ3	Belsonda	30.78	47.83	40.8	46.8
AAQ4	Bemcha	30.74	45.8	38.82	44.61
AAQ5	Nisda	30.54	48.46	40.96	48.32
AAQ6	Brahmni	34.87	44.23	39.76	44.06
AAQ7	Bhalera	28.28	44.87	37.92	44.74
AAQ8	Paraswani	30.4	43.99	35.14	43.68
AAQ9	Odka	27.43	43.51	36.77	43.39
AAQ10	Paragaon	28.08	44.55	38.08	44.27
AAQ11	Nandgaon	***26.17***	41.51	35.09	41.4
AAQ12	Acchhradih	31.08	35.96	33.21	35.61

Table-7: Ambient Air Quality in the Study Area PM10

Location Code	PM10 (µg/m^3)				
	Location	**Min**	**Max**	**Average**	**98th Percentile**
AAQ1	Project Site (Awadhram)	48.59	***73.38***	61.86	71.83
AAQ2	Project Site (Virendra Singh Thakur)	51.67	72.64	61	71.62
AAQ3	Belsonde	49.26	72.57	62.87	71.76
AAQ4	Bemcha	49.25	71.06	62.32	70.78
AAQ5	Nisda	47.88	72.31	60.96	70.78
AAQ6	Brahmni	46.08	69.59	58.66	68.12
AAQ7	Bhalera	58.74	68.79	64.14	68.38
AAQ8	Paraswani	56.95	68.6	62.37	67.78
AAQ9	Odka	***44.82***	67.69	57.06	66.26
AAQ10	Paragaon	44.84	64.81	53.09	64.73
AAQ11	Nandgaon	53.47	61.66	57.56	61.04
AAQ12	Acchhradih	52.26	61.32	57.1	60.8

Table-8: Ambient Air Quality in the Study Area SO2

Location Code	SO2 (µg/m^3)				
	Location	**Min**	**Max**	**Average**	**98th Percentile**
AAQ1	Project Site (Awadhram)	8.79	***12.64***	10.69	12.61
AAQ2	Project Site (Virendra Singh Thakur)	9.67	12.46	11.03	12.39
AAQ3	Belsonde	8.69	11.88	10.36	11.78
AAQ4	Bemcha	8.47	12.02	10.12	11.97
AAQ5	Nisda	8.53	11.63	10.17	11.58
AAQ6	Brahmni	7.89	11.54	9.91	11.54
AAQ7	Bhalera	8.83	11.64	10.03	11.63
AAQ8	Paraswani	***7.65***	11.23	9.79	11.13
AAQ9	Odka	8.06	12.04	10.03	11.84
AAQ10	Paragaon	8.74	11.63	9.88	11.55
AAQ11	Nandgaon	8.64	11.27	9.97	11.27
AAQ12	Acchhradih	8.87	11.23	9.89	11.13

Table-9: Ambient Air Quality in the Study Area NO2

Location Code	NO2 (µg/m^3)				
	Location	**Min**	**Max**	**Average**	**98th Percentile**
AAQ1	Project Site (Awadhram)	12.48	***22.90***	17.37	22.33
AAQ2	Project Site (Virendra Singh Thakur)	12.73	20.58	16.49	20.08
AAQ3	Belsonda	11.63	18.88	15.17	18.78
AAQ4	Bemcha	11.52	17.81	14.63	17.74
AAQ5	Nisda	12.45	18.42	15.40	18.24
AAQ6	Brahmni	12.58	18.43	15.69	18.35
AAQ7	Bhalera	12.48	18.61	16.21	18.51
AAQ8	Paraswani	***10.47***	18.64	15.45	18.44
AAQ9	Odka	12.23	18.63	14.86	17.67
AAQ10	Paragaon	12.48	17.89	15.01	17.66
AAQ11	Nandgaon	12.63	17.89	15.64	17.77
AAQ12	Acchhradih	11.37	17.63	15.03	17.63

From the above results, it is observed that the ambient air quality with respect to PM_{10}, $PM_{2.5}$, SO_2 and NOx at all the monitoring locations was within the permissible limits specified by CPCB.

3.3 Ambient Noise Levels

Ambient noise level monitoring was carried out at the 8 monitoring locations; those were selected for ambient air quality monitoring. The monitoring results are summarized in **Table 6.**

Table- 10 Noise Monitoring Sampling Stations

Code	Location	Distance (Km)	Direction
NQ-1	Project Site (Awadhram)	---	
NQ-2	Project Site (Virendra Singh Thakur)	---	
NQ-3	Belsonda	3.30 Km	East
NQ-4	Bemcha	7.85 Km	East
NQ-5	Nisda	1.92 Km	West
NQ-6	Brahmni	4.80 Km	SE
NQ-7	Bhalera	9.00 Km	SW
NQ-8	Paraswani	6.20 Km	NE
NQ-9	Odka	7.22 Km	West
NQ-10	Paragaon	3.45 Km	NW
NQ-11	Nandgaon	3.31 Km	South
NQ-12	Acchhradih	7.63 Km	NE

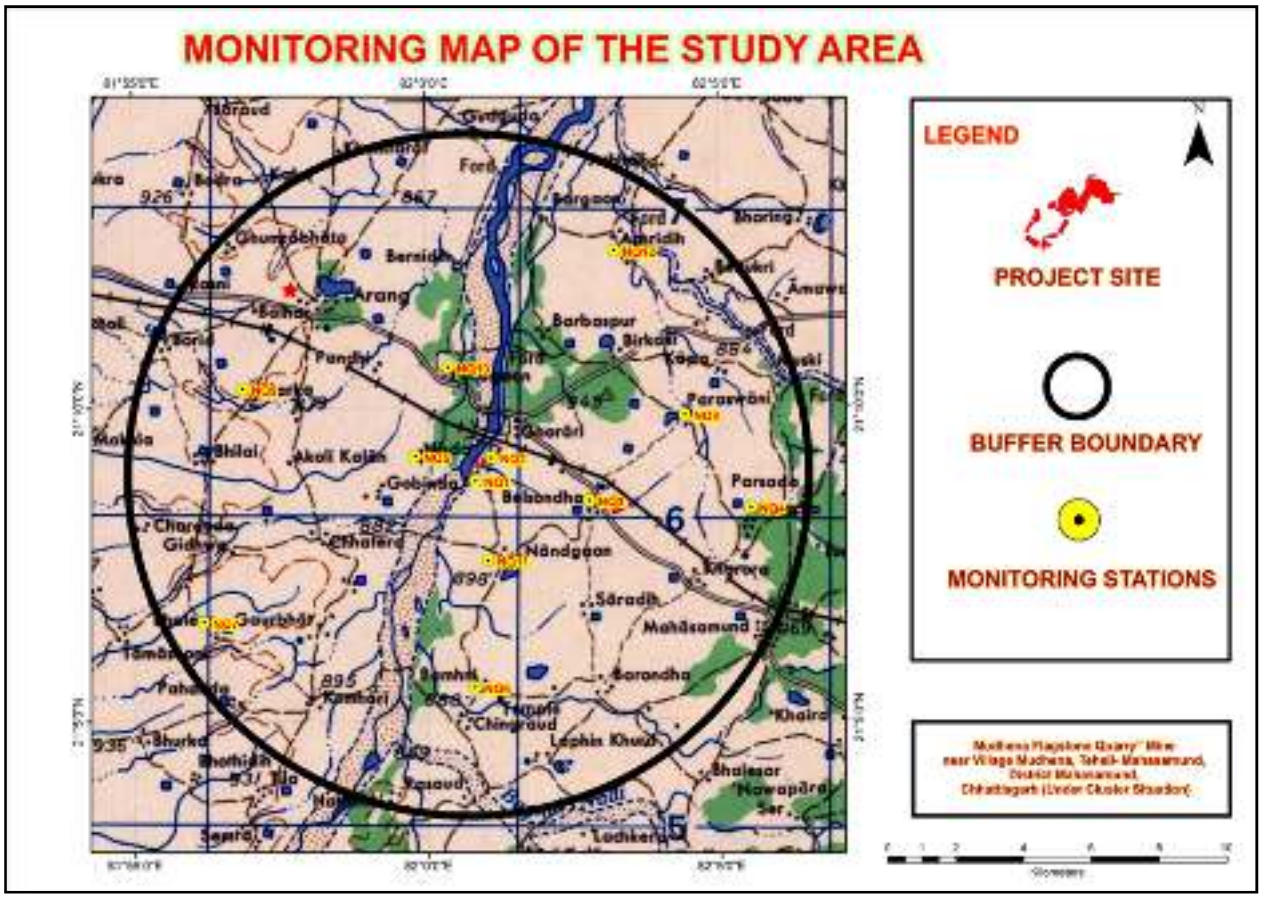

Fig -3 Ambient Noise Quality Monitoring Map

Table-11 Noise Monitoring Results

S. No.	Locations		Equivalent Noise Level, dB (A)			
			Limit (as per CPCB Guidelines),Leq, dB(A)		Observed value Leq, dB(A)	
			DAY*	NIGHT*	DAY*	NIGHT*
1	NQ1	Industrial Area	75	70	***54.0***	***42.5***
2	NQ2	Industrial Area	55	45	51.2	39.2
3	NQ3	Residential Zone	55	45	49.0	41.3
4	NQ4	Residential Zone	50	40	***35.0***	***32.3***
5	NQ5	Industrial Area	55	45	50.3	39.5
6	NQ6	Residential Zone	55	45	42.0	36.0
7	NQ7	Residential Zone	55	45	51.6	39.2
8	NQ8	Residential Zone	55	45	48.9	38.6
9	NQ9	Residential Zone	55	45	41.0	37.2
10	NQ10	Residential Zone	55	45	37.6	35.8
11	NQ11	Residential Zone	55	45	39.5	34.5
12	NQ12	Residential Zone	55	45	40.3	33.8

3.4 Ground and Surface Water Resources & Quality

Ground Water

Sampling was carried out at 12 locations during the study period. Sampling and analysis was carried out, as per standard methods and frequency of the sampling was thrice/stations. the summary of the results is presented below:

Analysis results of **Ground Water** reveal the following:

- **pH varies from to 7.11 to 7.80**
- **Total Hardness varies from 199 to 266mg/L.**
- **Total Dissolved Solids varies from 386 to 438 mg/L.**

Analysis results of Surface Water reveal the following:

- **pH varies from to 7.48 to 8.01**
- **Total Dissolved Solids varies from 309 to 331 mg/L.**
- **BOD varies from 3.0 to 5.0 mg/L.**
- **COD varies from 11.0 to 17.0 mg/L.**

The heavy metal contents are found to be negligible. Water quality is excellent but it is not potable due to presence of coliform. It can be used for drinking purpose after installing bacteriological.

3.5 Soil Quality

Sampling was carried out at 12 locations during the study period. The summary of the results are presented below:

The analysis Interpretation show that soil is basic in nature as pH value ranges from 7.10 to 8.20. The concentration of Nitrogen, Phosphorus and Potassium has been found to be in good amount in the soil samples. Soil texture is Clay Loam to Silty Clay Loam.

3.6 Biological Environment

Rare and Endangered Flora in the Study Area

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. These criteria are relevant to all species and all regions of the world. With its strong scientific base, the IUCN Red List is recognized as the most authoritative guide to the status of biological diversity. **Among the enumerated flora in the study area, none of them were assigned any threat category, by RED data book of Indian Plants.**

4.0 IMPACT ASSESSMENT AND MITIGATION MEASURES

4.1 AIR Pollution

The air quality modeling has been done and the details are given below:

Sr. No.	Activity in the Quarry	Maximum Baseline Concentration ($\mu g/m^3$)	Incremental GLCs ($\mu g/m^3$)	Resultant Concentration ($\mu g/m^3$)	Limit (Industrial, Residential, Rural and other area) ($\mu g/m^3$)
1.	Excavation+Loading+Transportation	78.83	7.0	85.83	100

Prevention and Control of Air Pollution

- The dust generated during the process will be minimized by water spray at the working faces before and after the activity.
- Plantation will be carried out on approach roads and in Lease boundary.
- Planning transportation routes of mined material so as to reach the nearest paved roads by shortest route. (minimize transportation over unpaved road;
- Personal Protection Equipment's (PPE) like dust masks, ear plugs etc. will be provided to mine workers.
- Speed limit will be enforced to reduce airborne fugitive dust from vehicular traffic.
- Deploying PUC certified vehicles to reduce their noise emission.
- Spillage from the trucks will be prevented by covering tarpaulin over the trucks.

4.2 Water Quality Management

The impact of mining project on groundwater hydrology and surface water regime are site specific and depends upon the characteristics of the mineral, hydrogeology and requirement of groundwater for other uses.

ANTICIPATED IMPACTS

- No natural course of water stream is interrupted or diverted due to mining activity; hence no impact on natural drain is anticipated.
- Surface run off distribution during rainy season may get affected due to excavated pits and overburden stack.

- Runoff from the mining benches or from overburden during the rainy season may get contaminated.
- Ground water pollution can take place only if the mining rejects contain toxic substances, which get leached by the precipitation water and percolate to the ground water table thus polluting it. Any nearby wells or other sources of water can be rendered unfit for drinking and even for industrial use.
- Domestic sewage will be generated which can create contamination.

MITIGATION MEASURES

- Overall drainage planning has been done in such a manner that the existing pre-mining drainage conditions will be maintained to the extent possible so that run off distribution is not affected.
- The waste dump will be protected by retaining walls around the dump., moreover the excavated mineral itself is non-toxic and hence no effect due to water flow during rains following the contours of the area is expected.
- The excavated pit will be converted into the water reservoir at the end of mine life. This will help in recharging ground water table by acting as a water harvesting structure.
- Garland drain will be constructed on all sides of quarry along with settling pond in the lowermost part to remove the suspended solids from storm water. The collected water shall be used in plantation and spraying on haul roads. Settling ponds will be designed on the basis of silt loading, slope of the lease, detention time required etc.
- Septic tanks and soak pits will be provided for the disposal of domestic effluent generated from mine site.

4.3 Noise Pollution Control

The area generally represents calm surroundings. There is no heavy traffic, industry or noisy habitation in the area except the existing mine. As the project is proposed for open cast manual method mining.

Noise pollution is mainly due to occasional plying of trucks. These activities will not cause any problem to the inhabitants of this area because there is no human settlement in close proximity to the lease area.

ANTICIPATED IMPACT

- The source of Noise pollution will be the vehicular movements.
- Noise will be generated by the digging of mine area using shovels, crowbars etc.

MITIGATION MEASURES

- **Maintenance of Machinery:** - The vehicles operating will be maintained and provided with good silencers. All machines will be used at optimum capacity.
- **Vegetation:** Plantation of trees around haul roads will be done to reduce the noise.
- **Hearing Protection:** Equipment like ear-muffs, ear-plugs, etc. are commonly used devices for hearing protection.

4.4 Greenbelt Development and Plantation

A green belt will be developed along the roads, barren area, surrounding office, rest shelter and other social forestry program. Green belt is erected not from biodiversity conservation point of view but is basically developed as a screen to check the spread of dust pollution. It is proposed to total number of plants **1600 numbers sapling during 1st five years.** Afforestation will be taken up in the statutory safety zone of 7.5 m along the lease boundary.

PLANTATION EXPENDITURE IN THE 7.5 M SAFETY ZONE								
S. No.	ITEM	RATE (inRs.)	QUANTITY (kg/days)	AMOUNT (in Rs.)				
				1st Year	2nd year (90% survival)	3rd year (90% survival)	4th Year (90% survival)	5th Year (90% survival)
1	Plants of local species ie. Neem, Karanj, Kadam, Aamla, Babool, Chirol etc.	1600 (Rs 50 per sapling)	1600 Plants	80000	8000	8000	8000	8000
2	Fencing around with chain link wire including cement pillar	Number of Pillar (Rs 100 per Pillar)	300	30000	-	-	-	-
		Rs 200/mtr	1490	2,98,000	-	-	-	-
3	Labour charge	-	-	2,40,000	-	-	-	-
4	Plantation dig (45cm x 45cm x 45cm) size	Rs 20 per dig	1600 Plants	32,000	3200	3200	3200	3200
5	Manure (cow dung / vermi compost) 250gm/plant	Rs 20 /kg	400 kg	8000	800	800	800	800
6	Water Tank For Water sprinkling	Rs 500 /day (2 Tanker)	240 days	240000	240000	240000	240000	240000
7	Gardner (Maintenance)	Rs 3000/month @ 12 month		36,000	36,000	36,000	36,000	36,000
8	Insecticide Powder	-		20,000	2,000	2,000	2,000	2,000
9	Miscellaneous & Others (Board)	-	-	5,000	5,000	5,000	5,000	5,000
	Total			**9,79,000**	**2,95,000**	**2,95,000**	**2,95,000**	**2,95,000**

4.5 Solid and Hazardous Waste Generation and Management

No solid waste will be generated.

4.6 EMP and CER Details

The capital cost of proposed EMP measures is **Rs.5,07,456** and recurring cost of the EMP measures, including the environmental monitoring activities, is **Rs. 3,54,966.**

It is proposed to undertake the need specific proposed CER activities in the surrounding areas of the mine. The project proponent has proposed to incur budget of **Rs. 4,21,000/-**for CER activities.

5.0 CONCLUSION

As discussed, it is safe to say that the project is not likely to cause any significant impact on the ecology of the area, as adequate preventive measures will be adopted to contain the various pollutants within permissible limits. Green belt development around the area will also be taken up as an effective pollution mitigative technique, as well as to control the pollutants released from the premises of the project.