EXECUTIVE SUMMARY

OF

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

&

ENVIRONMENTAL MANAGEMENT PLAN

FOR

Anjan Hill Opencast Coal Mine

(Project Area: 388.261 Ha & Mine Area 211.54 ha)

with Coal production capacity of 1.35 million TPA

At

Village Bhandardehi, Tehsil: Chirimiri,
District: Manendragarh-Chirmiri-Bharatpur, State: Chhattisgarh

PROJECT PROPONENT

SECL
South Eastern Coalfields Limited

M/s. South Eastern Coalfields Limited

(A Miniratna Subsidiary Company of Coal India Limited)
Seepat Road,
Bilaspur (Chhattisgarh) - 495006

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1.0 PROJECT DESCRIPTION

1.1 INTRODUCTION OF PROJECT PROPONENT

South Eastern Coalfields Limited (SECL) was incorporated on 28.11.1985 with the objective to acquire and take over business of the Bilaspur division of Western Coalfields & the Talcher division of Central Coalfields limited. SECL is a Schedule-B Miniratna CPSE in the coal & lignite sector. It is one of the eight subsidiaries of Coal India Limited (A Govt. of India Undertaking) under the Ministry of Coal having registered Corporate Office at Bilaspur, Chhattisgarh

SECL is amongst the highest coal producing subsidiary company of Coal India Limited. The coal mines of SECL are spread across two states namely Chhattisgarh and Madhya Pradesh.

SECL operates 60 coal mines, of which 35 coal mines lies in Chhattisgarh State, while rest 25 coal mines are situated in Madhya Pradesh state. And of these 60 noes of coal mines, 40 mines are worked by underground method of mining while rest 20 no of mines are Opencast mines.

Along with this, SECL is committed towards operational aspect of coal carbonization plant of Dankuni coal complex however, Dankuni coal Complex at Dankuni, West Bengal has been given on lease basis by CIL. For effective administrative control and operation, coal mines at SECL have been divided into three groups viz Central India coalfields (CIC), Korba coalfields and Mand-Raigarh Coalfields

1.2 TYPE OF PROJECT

M/s. Southern Eastern Coalfields Limited has proposed proposing Anjan Hill Coal Mine (Project Area: 388.261 ha & Mine Area 211.54 ha) with Coal Production Capacity: 1.35 Million TPA by Opencast Mining Method at Village Bhandardehi, Tehsil: Chirimiri, Districts: Manendragarh-Chirmiri-Bharatpur, Chhattisgarh. Anjan Hill Coal Mine located in the South Eastern part of Chirimiri coalfield. The mine falls under Chirimiri Command Area of M/s. South Eastern Coalfields Limited, a subsidiary of Coal India Limited.

As per EIA Notification dated 14.09.2006, as amended thereof, this project falls in Category 'B' Project or Activity 1(a)-4 for "Mining of Minerals".

1.3 BRIEF DESCRIPTION OF THE PROJECT

Table – 1

Brief Description of the Project

S. No.	Particulars	Details
A.	**Nature of project**	Proposed Opencast Fully Mechanized Mine
B.	**Size of project**	
1.	Project Area	388.261 Ha
2.	Mine Area	211.54 Ha
3.	Production Capacity	1.35 Million TPA
C	**Project Location**	
1.	Village	Bhandardehi

S. No.	Particulars	Details
2.	Tehsil	Chirmiri
3.	District	Manendragarh-Chirmiri-Bharatpur
4.	State	Chhattisgarh
5.	Coordinates	Latitude: 23°09'54" N to 23°11'37" N Longitude: 82°17'40" E to 82°20'55" E
6.	Toposheet No.	F44E8 (64I/8), F44E7 (64I/7), F44E4 (64I/4), F44E3 (64I/3)
D	**Environmental Setting Details (*with approx. aerial distance & direction from the mining lease boundary***	
1.	Nearest Highway	NH-78 (~ 9.5 km in NW direction)
2.	Nearest Railway Station	➢ Paradol Railway Station (~3.5 km in West Direction) ➢ Chirimiri Railway Station (~4 km in ENE Direction)
3.	Nearest Airport	Swami Vivekanand Airport, Raipur (~230 km in South Direction)
4.	Nearest Town/City	Bartunga- Chirimiri (~4.5 km in ESE direction)
5.	National Parks, Wildlife Sanctuaries, Biosphere, Wildlife corridors, Tiger/Elephant Reserves, etc. within 10 km radius study area	There are no National Park, Wild Life Sanctuary, Biosphere Reserves, Tiger/Elephant Reserves and Wildlife Corridors etc. within 10 km radius study area.
6.	Reserve Forests (RF)/ Protected Forests (PF) etc. within 10 km radius study area	There are 03 Protected Forests and 06 Reserved Forests within 10 km radius study area: **03 Protected Forest** ➢ Khairbana PF (~6.0 km in NNW Direction) ➢ Chirapani PF (~8.0 Km in NE Direction) ➢ Protected Forest (~8.0 Km in SE Direction) **06 Reserve Forest** ➢ Paradol RF (Within ML Area) ➢ Kelua RF (~3.0 Km in SE Direction) ➢ Khurasiya RF (~4.0 km in NE Direction) ➢ Bundiyabahara RF (~4.5 Km in ESE Direction) ➢ Barband RF (~7.5 Km in NE Direction) ➢ Banjaridand RF (~7.5 Km in ESE Direction)
7.	Water Body within 10 km radius study area	➢ Kauriya Nadi (~1.0 km in North Direction) ➢ Kaurjharia Nala (~1.5 km in SSW Direction) ➢ Bahindola Nala (~6.5 km in SSW Direction) ➢ Hasdo River (~7.0 km in NW Direction) ➢ Garaburi Nala (~8.0 km in SSW Direction) ➢ Halphani Nala (~8.2 km in NNE direction) ➢ Kudra Nala (~8.5 km in East Direction) ➢ Lohandduda Nala (~8.7 km in East Direction) ➢ Gorghela Nala (~9.0 km in SE Direction) ➢ Karelidhar Nala (~9.0 km in South Direction) ➢ Puraur Nala (~9.2 km in South Direction)

S. No.	Particulars	Details
		➢ Aaruni Dam (~9.5 km in NNE Direction)
8.	Seismic Zone	Zone – III as per IS: 1893 (Part-I): 2002
D	**Cost Details**	
1.	Project Cost	Rs. 232.91 Crore
2.	Cost of EMP	Capital Cost: Rs. 28.42 Crore Recurring Cost: Rs. 3.61 Crore/annum

Source: *Site Visit & Pre-feasibility Report*

1.4 LOCATION MAP

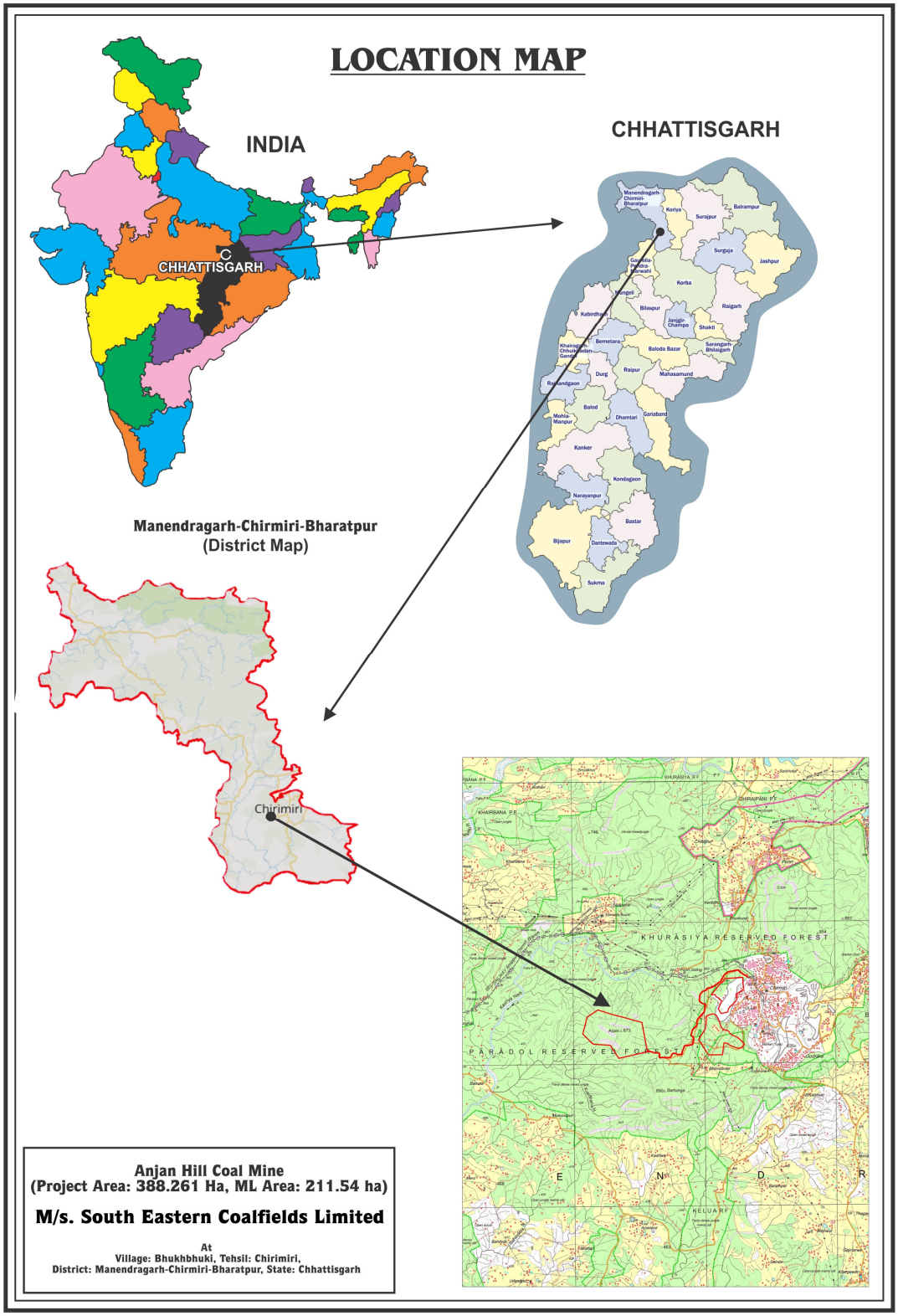

Figure-1: Location Map (Showing general as well as specific location of the ML area)

1.5 MINE DESCRIPTION

1.5.1 MINING LEASE STATUS

By virtue of THE COAL MINES (NATIONALISATION) ACT, 1973, read with The Coal India (Regulation of Transfers and Validation) Act, 2000 and The Mineral Concession Amendment Rules, 2021, deemed mining lease has been granted to SECL with a validity up to 06.05.2036 which will be further extended for 20 years on submission of application to State Government

1.5.2 MINING DETAILS

Table – 2

Mining Details

S. No.	Particular	Details
1.	Method of Mining	Opencast mining method
2.	Rated Capacity	1.35 Million TPA
3.	Gross Geological Reserve	35.79 Million Tonnes
4.	Net Geological Reserves	32.11 Million Tonnes
5.	Mineable Reserves	29.12 Million Tonnes
6.	Extractable Reserves	27.75 Million Tonnes
7.	Reserves depleted (till base date)- Reserves Mt	3.00 Million Tonnes
8.	Balance Extractable Reserve	24.75 (OC) + 1.00 (Highwall) = 25.75 Million Tonnes
9.	Life of mine	21 Years
10.	No. of Working Seams	4 seams
11.	Seams Thickness	1.07 m to 10.35 m
12.	Seam Depth Range	10 m - 260 m
13.	Elevation Range	625 m to 875.22 m
14.	Water table	475 m AMSL Pre Monsoon: 2.2 to 39 m bgl Post Monsoon: 0.95 to 20.54 m bgl
15.	Ultimate Working Depth	590 m AMSL 10 m to 80 m bgl
16.	ROM/Waste Ratio (tones: cum)	7.58 and 7.29 (with Highwall)
17.	No of working days	300
18.	Number of shifts per day	3

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

1.5.3 METHOD OF MINING

The proposed opencast mining at Anjan Hill Coal Mine will be carried out using a conventional mining method involving drilling, blasting, excavation, loading, and transportation. Coal will be extracted using the Pay Loader–Dumper combination, while overburden (OB) will be removed using the shovel-dumper method along with drilling and blasting. Topsoil will be scrapped using a dozer or shovel before preparing the ground for drilling and blasting, and will be transported to designated storage areas. Blasted coal will be transported by dump trucks to the surface coal

yard, whereas OB will be transported to specified dump sites. Blasting will be controlled using delay detonators to prevent blown-through shots

2.0 DESCRIPTION OF THE ENVIRONMENT

The Primary baseline data for specific micro - meteorology data, ambient air quality, waste quality, noise level, soil and flora & fauna has been collected during Summer Season (March to May, 2024). The monitoring results of ambient air, surface water, soil, ambient noise and ground water have been reported.

2.1 PRESENTATION OF RESULTS (AIR, NOISE, SURFACE WATER, GROUND WATER & SOIL)

Ambient Air Quality Monitoring reveals that the concentrations of PM2.5 and PM10 for all the 10 AAQM stations were found between 20.3 to 46.8 µg/m^3 and 36.5 to 80.6 µg/m^3 respectively. As far as the gaseous pollutants SO2 and NOx are concerned, the prescribed CPCB limit of 80 µg/m^3 has not surpassed at any station. The concentrations of SO2 and NO2 were found to be in range of 4.1 to 14.2 µg/m^3 and 8.7 to 26.8 µg/m^3, respectively. The values of PM10 and PM2.5 were found more at Town Chirmiri

Ambient noise levels were measured at 10 locations in and around the project site. Noise levels vary from 48.8 to 54.3 Leq dB (A) during day time and from 39.2 to 43.8 Leq dB(A) during night time. Maximum noise levels during day & night time were recorded at Town Chirmiri

Surface water analysis has been done from 5 water bodies. The pH of the water bodies ranges from 7.5 to 7.73, Total hardness (108.21 to 120.8 mg/l), Calcium (29.35 to 34.14 mg/l), Alkalinity (87.12 to 99.5 mg/l), Chloride (18.89 to 22.89 mg/l), Magnesium (8.48 to 10.21 mg/l), Total Dissolved Solids (152 to 204 mg/l), Sulphate (10.69 to 26.52 mg/l), Fluoride (0.18 to 0.32 mg/l), Nitrate (0.69 to 0.96 mg/l), Iron (0.05 to 0.09 mg/l), Zinc (0.03 to 0.1 mg/l), Biochemical Oxygen Demand (3.5 to 5.5 mg/l), Chemical Oxygen Demand (10.04 to 19.72 mg/l), Sodium as Na (10 to 13 mg/l), Potassium as K (BDL to 2 mg/l), Conductivity(236 to 318 µs/cm), Dissolved Oxygen (7 to 7.3 mg/l).

The **ground water/drinking water** samples were collected from 8 locations. The physico-chemical quality of groundwater was compared with drinking water standard (IS: 10500 - 2012). The pH of collected water samples varied from 6.76 to 7.58. Total hardness varied from 105.1 mg/l to 251.5 mg/l. Total dissolved solids varied from 155 mg/l to 281 mg/l. The water samples contain Calcium ranging from 14.2 to 55.77 mg/l, Alkalinity ranging from 86.5 to 184.7 mg/l, Chloride ranging from 19.81 to 50.54 mg/l, Magnesium ranging from 7.97 to 16.59 mg/l, Total Dissolved Solids varied from 155 mg/l to 352 mg/l, Sulphate from 10.08 to 28.32 mg/l, Fluoride ranging from 0.19 to 0.58 mg/l, Nitrate ranging from 0.73 to 1.65 mg/l, Iron ranging from 0.07 to 2.12 mg/l, Zinc ranging from 0.05 to 0.29 mg/l, Manganese ranging from BDL (DL 0.01 mg/l) to 0.12 mg/l, Sodium ranging from 12 to 25 mg/l, Potassium BDL (DL 1.0 mg/l) to 5 mg/l, Conductivity 233 to 530 µS/cm.

Soil Samples collected from identified 8 soil locations. The soil samples indicate pH value ranging from 6.66 to 7.36, conductivity (0.07 to 0.87 mS/cm), Chloride (559.52 to 959.15 mg/kg), Sodium (24.8 to 223.93 mg/kg), Chromium (8.68 to 18.51 mg/kg), Lead (7.75 to 14.53 mg/kg), Copper (15.34 to 30.98 mg/kg), Organic Carbon (0.3 to 0.47 %), Water holding capacity (24.71 % to 33.97 %), and Organic Matter ranged from 0.51 % to 0.87 % in the soil samples.

2.2 BIOLOGICAL ENVIRONMENT

There is no National Park, Wildlife Sanctuary, Biosphere Reserves, Tiger/Elephant Reserves and Elephant Corridors etc. within 10 km radius of the block area. There are 03 Protected Forests and 07 Reserve Forests within the study area.

9 schedule I Species i.e., Sloth bear (*Melursus ursinus*), Stripped hyaena (*Hyaena hyaena*), Indian Pangolin (*Manis crassicaudata*), Jackal (*Canis aureus*), Indian monitor lizard (*Varanus benglensis*), Python (*Python molurus*), Cobra (*Naja Naja*), Russell's viper (*Vipera russelii*), Indian Peafowl (*Pavo cristatus*) found in the area. Wildlife Conservation Plan has been prepared and submitted to State Forest Department on 10.11.2025 for approval

2.3 SOCIO-ECONOMIC ENVIRONMENT

Chhattisgarh is a state in Central India. It is the 10th largest state in India, with an area of 135,192 km2. With a population of 25.5 million (census 2011), Chhattisgarh is the 17th most populated state of the nation. Chhattisgarh is a major source of electricity and steel for India. Chhattisgarh accounts for 15% of the total steel produced in the country. All these factors combined with growing infrastructure and investment within the state, as well as initiatives taken by the government Chhattisgarh is one of the fastest developing states in India.

The population as per 2011 Census records is 140323 (for the 10 km buffer zone). Total no. of household is 19741, 3388 and 8391 in primary, secondary and outer zone respectively. Sex ratio is 924, 979 and 975 (females per 1000 males) observed in primary, secondary and outer zone respectively. SC population distribution is 10905, 912 and 3629 in primary, secondary and outer zone respectively. ST population distribution is 12503, 12190 and 19940 in primary, secondary and outer zone respectively.

3.0 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A. AIR QUALITY MANAGEMENT

- Wet drilling will be carried out along with dust collection system.
- Blasting will be carried out with optimal quantity of explosives and with technically established blast design.
- OB removal will be undertaken by drilling-blasting by deploying shovel-dumper.
- Controlled blasting techniques will be adopted.
- Blasting will be carried out during day time only.
- Regular monitoring of mine atmosphere i.e. the presence of noxious and inflammable gases in the grooved-out workings and active working should be made and precautions should be taken accordingly.
- PUC certified vehicles will be used and Regular maintenance of HEMMs & transportation vehicles will be done.
- Permanent water sprinkling arrangements will be done for main haulage road and Approach Road.
- Personal Protective Equipment like dust masks, ear plugs, ear-muffs will be provided to mine employees.
- Plantation around mine boundary, road as safety barrier will be carried out.
- Ambient Air Quality will be monitored regularly & maintained in prescribed norms

B. NOISE LEVEL MANAGEMENT

Following measures will be taken for noise pollution control: -

- Drilling with sharp drill bits to achieve optimum drilling performance and to reduce noise generation at source will be adopted.
- OB removal will be undertaken by drilling-blasting by deploying shovel-dumper.
- Personal protective equipment's i.e. earmuffs/ earplugs in drilling & in high noise area shall be used.
- As Control blasting will be done in accordance with standards prescribed by DGMS for controlled blasting; therefore, ground vibrations will not affect the structures in the vicinity of mine area.
- Proper and routine maintenance of HEMMs, oiling and greasing of machines at periodic intervals shall be carried out.
- Development of green belt & plantation will be carried out over the safety zone around the mining & Approach Road.
- Work place noise monitoring will be carried out quarterly.
- Vibrations and noise monitoring will be carried out regularly

C. WATER AND WASTE WATER MANAGEMENT

- No seasonal /perennial water body exist in the mining lease area.
- Garland drain having siltation pits will be provided at the toe of the dumps, to arrest the silt and sedimentation flow and to channelize the runoff water from dumps. The water will be utilized for watering the mine area, roads, green belt development etc.
- The total water requirement will be 325 KLD including 25 KLD domestic water requirement. Industrial water required for HEMM washing, sprinkling on haul roads for dust suppression and for watering the mine site plantations.
- Water requirement for Industrial use shall be catered by mine sump water shall be pumped out and treated in settling tank and stored surface reservoir. Domestic water requirement will be catered from Borewells.
- The only source of waste water generation shall be Domestic use and washing.
- The Domestic waste water will be treated in STP (capacity 30 KLD) and utilized for Plantation and Green Belt Development. The Waste water from Vehicle Washing will be treated in ETP (capacity 10 KLD) and reused for washing purpose

D. GREENBELT/ PLANTATION

- Greenbelt will be developed with 9977 saplings over 4.43 ha area along 7.5 m periphery of mine within 10 years of mining operation. Plantation will be developed with 5,17,765 saplings over 207.11 ha backfilled area, 4,20,000 saplings over 168 ha area of external dump and 3840 saplings over 1.92 ha along the road. Therefore, at conceptual stage, total 381.46 ha area will be covered under Greenbelt/plantation
- Native Plant species such as Teak, Palash, Saja, Bija, Khair, Amla, Arjun, Pipal, Safed Siris, Dhok, Dhaura, Shisham, Neem, Mango, Mahua, Amaltas, Karanj, Yellow Kasood, Bargad, Ashok, Jamun, Imli, Guava, Chiku etc. will be planted by company as per CPCB guidelines.

E. SOLID WASTE MANAGEMENT

- ***Top Soil:*** At the conceptual period, 4.22 million cum of Top soil will be generated, out of which 3.78 million cum will be used in spreading over external dump area and remaining 0.44 million cum of top soil will be used for spreading over backfilled area.
- ***OB/ Waste:*** At the conceptual period, 187.70 Million Cum of OB will be generated out of which 87.32 million Cum of OB will be dumped in de-coaled void of the quarry up to 90 m height and remaining 100.38 million cum of OB will be backfilled in the excavated area of 207.106 ha up to a max height of 90 m followed by plantation

4.0 ADDITIONAL STUDIES

Additional Studies i.e., Hydro –Geological Study, Risk Assessment & Disaster Management Plan, Land use and land cover study, Ecology and Biodiversity are covered in Draft EIA/EMP Report as per the Terms of references granted by SEIAA, Chhattisgarh vide letter no. OL/TOR/MIN/MCB/4481 dated 03/11/2025 in favor of M/s. Southern Eastern Coalfields Limited.

5.0 PROJECT BENEFITS

The project activity will help in meeting the growing demand of steel & hence help in the economic growth of the country. M/s. Southern Eastern Coalfields Limited will actively involve in the implementation of CSR activities. It will be helpful in the development of basic needs of the local area like education, Health & family welfare, women empowerment, Natural resource management, water conservation, roads etc. It will result in growth of the surrounding areas by increasing direct and indirect employment opportunities in the region including ancillary development, overall improvement in Human Development Index and supporting infrastructure.

6.0 CONCLUSION

The Coal Mining project will prove beneficial to the local people as direct and indirect employment opportunity will be generated improving their living. There will be increase in revenue generation to the government by way of royalty, NMET, DMF, TCS and government taxes etc. Further improvement in infrastructure will take place like education, roads, availability of drinking water, medical facilities and growth of allied in adjacent villages.

There will be no significant pollution of air, water, soil and noise. Regular monitoring of all the components of environment will be done. Increased social welfare measures taken by the company will bring development in the near-by villages.

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