CHHATTISGARH MINERAL DEVELOPMENT CORPORATION LTD.

EXECUTIVE SUMMARY

FOR

TARA COAL BLOCK

(EXTENT 2778.19 Ha)

DISTRICT SARGUJA, CHHATTISGARH

JULY, 2007

Prepared by:

MIN MEC CONSULTANCY PVT. LTD.

A-121, Paryavaran Complex, IGNOU Road, New Delhi – 110 030

Ph : 29534777, 29532236, 29535891 ; Fax: 091-11-29532568

Email :min_mec@vsnl.com; Web site:http://www.minmec.co.in

Estb. 1983

An ISO 9001:2000 approved company

EXECUTIVE SUMMARY
FOR
TARA CENTRAL COAL BLOCK AT DISTT. SARGUJA, CHATTISGARH
(EXTENT – 2778.19)

1.0 INTRODUCTION

1.1 General

Govt. of India has allocated Tara coal block to Chhattisgarh Mineral Development Corporation Ltd., (registered under Companies Act, 1956) for mining of coal. The coal produced from the Tara coal block will be supplied to the 1000 MW Power plant of IFFCO-Chhattisgarh Power Limited (JV of CSEB and IFFCO) to be located 6 km from mine head in Premnagar/ Chandannagar. In order to get mining lease, Chhattisgarh Mineral Development Corporation Ltd. has applied for Mining Lease over an area of 2778.19 Ha covering villages of Tara, Kantaroli, Janardhanpur and Mendra. The envisaged production of coal is 6 million tonnes per annum (MTPA) and the mine life would be 45 years.

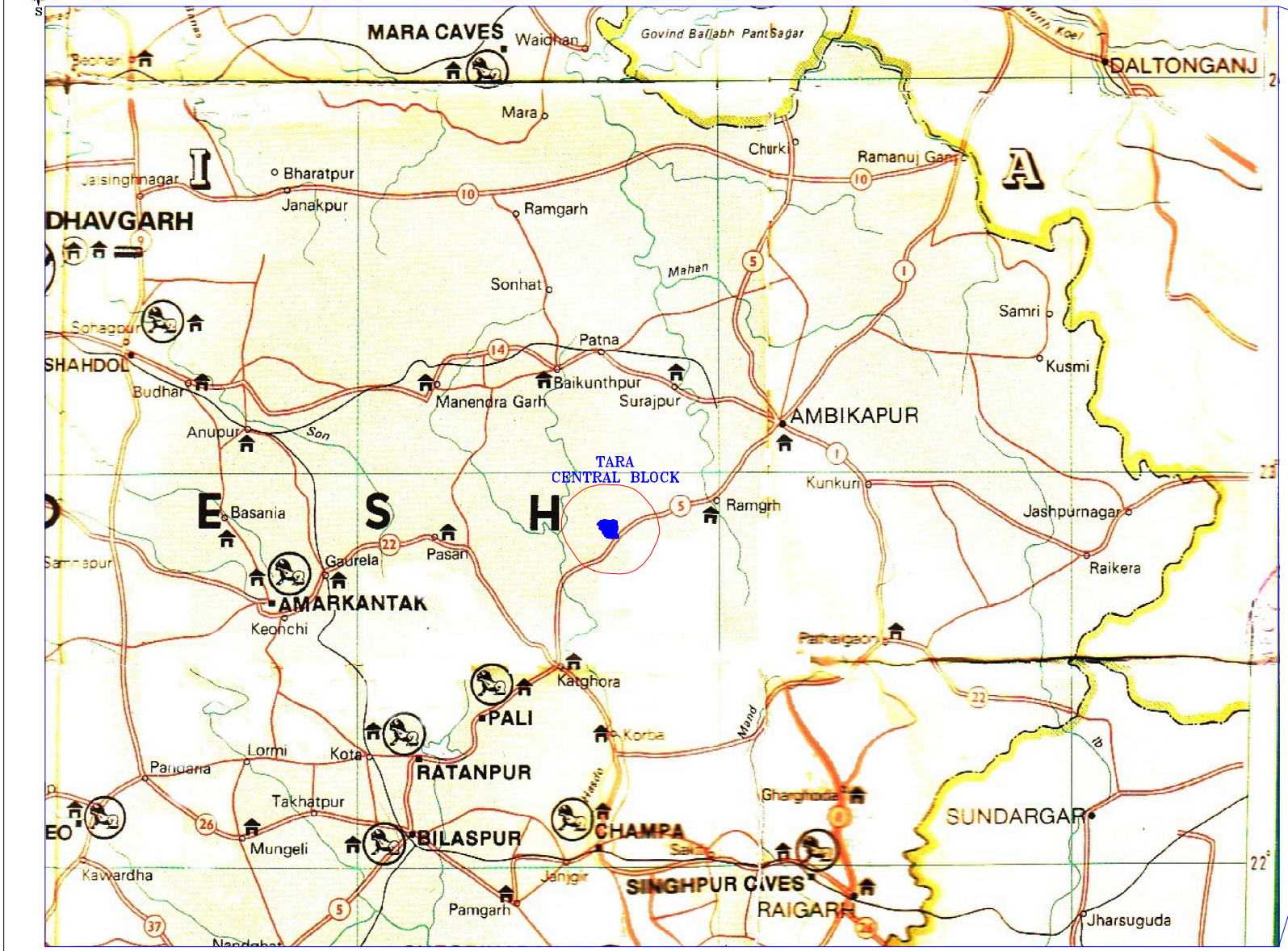
The mining and allied activities in this sub-block will be conducted by Chhattisgarh Mineral Development Corporation Ltd. or its subsidiary.

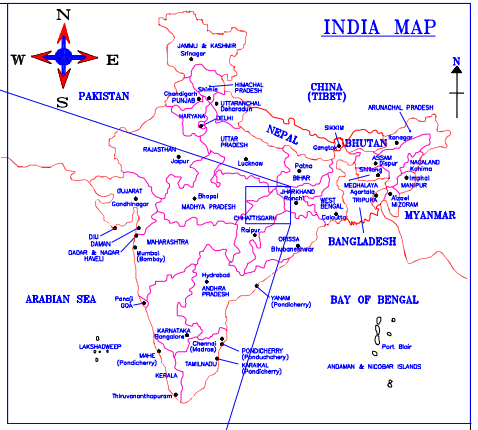
1.2 Location and communication

The area falls in Survey of India toposheet No. 64 J/9 and 64J/13 and is limited by longitude 82° 42' 10" E to 82° 45' 33" E and latitude 20° 49' 18" N to 20° 52' 19" N. The Tara Central block is situated in the western half of the Hasdo-Arand Coalfield. Administratively, the block falls in Surguja district of Chhattisgarh and is about 66 km SSW of Ambikapur, the district headquarters. The location is shown in **Fig 1**.

The State Highway No. 5 joining Bilaspur with Ambikapur passes through the eastern and southern parts of the block running roughly in NE-SW direction. In the central and north-western parts of the block, a fair weather road connects Tara village to Premnager village. Besides these, a number of forest and village roads criss-cross the block.

The nearest railway station is Bisrampur and is about 110 km NE of Tara Coal Block.





LEGEND

SITE LOCATION

7KM STUDY AREA

NEAREST LOCATIONS FROM PROJECT SITE

PLACE OF TOURIST INTEREST
pali, 62KM (SSW)

REST HOUSE, DAK BUNGALOW
PASAN, 46KM (W)
RAMGARH, 27KM (E)

0 20 40 60 80KM

SCALE

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NEW DELHI, PH. 29534777, 29535891
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CLIENT: C.M.D.C.

PROJECT: TARA CAOL BLOCK

TITLE: SUMMARY

LOCATION MAP

DRAWN BY:	CHECKED BY:	FIG. NO.
B.R. MATLOTIA	B.D. SHARMA	1
SCALE : AS SHOWN	DATE : 12-07-2007	

2.0 PROJECT DESCRIPTION

2.1 Geology

The Hasdo-Arand coalfield extends over an area of about 1200 Sq.km, covering Korba and Surguja districts of the Chhattisgarh state.

The Hasdo-Arand coalfield is bounded on the north by a vast stretch of Talchir rocks and gneisses, on the east by the Main Pat Plateau. The Korba coalfield lies to the south west of the Hasdo-Arand coalfield. This coal basin is a part of the Son-Mahanadi master Gondwana basin.

Local Geology

The block is mostly covered by soil and alluvium of residual nature. The weathered mantle constitutes the soil and the weathered rocks belongs to Barakar formation. Barakars shows transitional contract with the underlying Talchir formation

The Hasdo-Arand Coalfield shows a broad similarity of structural set-up with that of the adjoining Korba Coalfield. The southern boundary of the coalfield is delineated by an east-west boundary fault, which brings the coal measures in juxtaposition with the Precambrian and Talchir rocks on the south. Near the boundary fault, the Barakar sandstones are highly silicified and have given rise to continuous ridges. Along the northern boundary of the coalfield, the coal measures rest conformably on the Talchir Formation. As such, the basin shows a half-graben configuration.

The general dip of the beds is southerly, the amount being 5° to 8°. In the vicinity of the southern boundary fault, a reversal of dip towards north is recorded. Locally, the beds show low rolling dips. The unevenness of the basement topography is manifested as hummocky inliers of Precambrian rocks within the Gondwana Formations. In the eastern part the strike swings towards NW-SE. Similar swing in the strike is also recorded from the Salaigot and Sitipakhna areas in the western part of the coalfield

Coal Quality

The average ROM coal is non-coking "E" Grade. No benefication is proposed.

Reserve

Reserve have been calculated for the 3 seams viz. seam I, seam III and seam IV.

The extractable reserve base of 252.04 million tonnes of coal, assessed based on the Geological Report on Exploration for Coal, Tara Central Block (Non-CIL) prepared by MEC, will sustain a mine life for a period of 45 years for a production capacity of 6 MTY. The basic Project Parameters of the proposed mining block are given in Table 1

TABLE 1
BASIC PROJECT PARAMETERS

Sl. No.	Parameters	Unit	Value
1.	Geological Reserves of Tara Block	Mt	317.33
2.	Extractable reserves in the delineated Mining Block	Mt	252.04
3.	Average Coal quality	Grade	E
4.	Volume OB	Mcum	1714.14
5.	Stripping ratio	Cum/t	6.80
6.	Target Capacity	Mt	6.00
7.	Mine life	Year	45

2.2 Mining

The most suitable mining technology for opencast mining will be using a combination of Draglines and Truck and Shovel system. The mine will start from the incrop and gradually advance to dip side. The mine will be worked in two pits, Eastern and Western. The height of dragline overburden bench will vary as per coal exposure requirement. The coal from all the three seams is proposed to be extracted by shovel and transported to receiving pit by coal body rear dumpers.The final stage mine plan is shown in **Fig.2**.

2.3 Details of Mining Method

Opencast

Coal Mining

The most suitable mining technology for opencast mining will be using a combination of Draglines and Truck and Shovel system, considering the following:

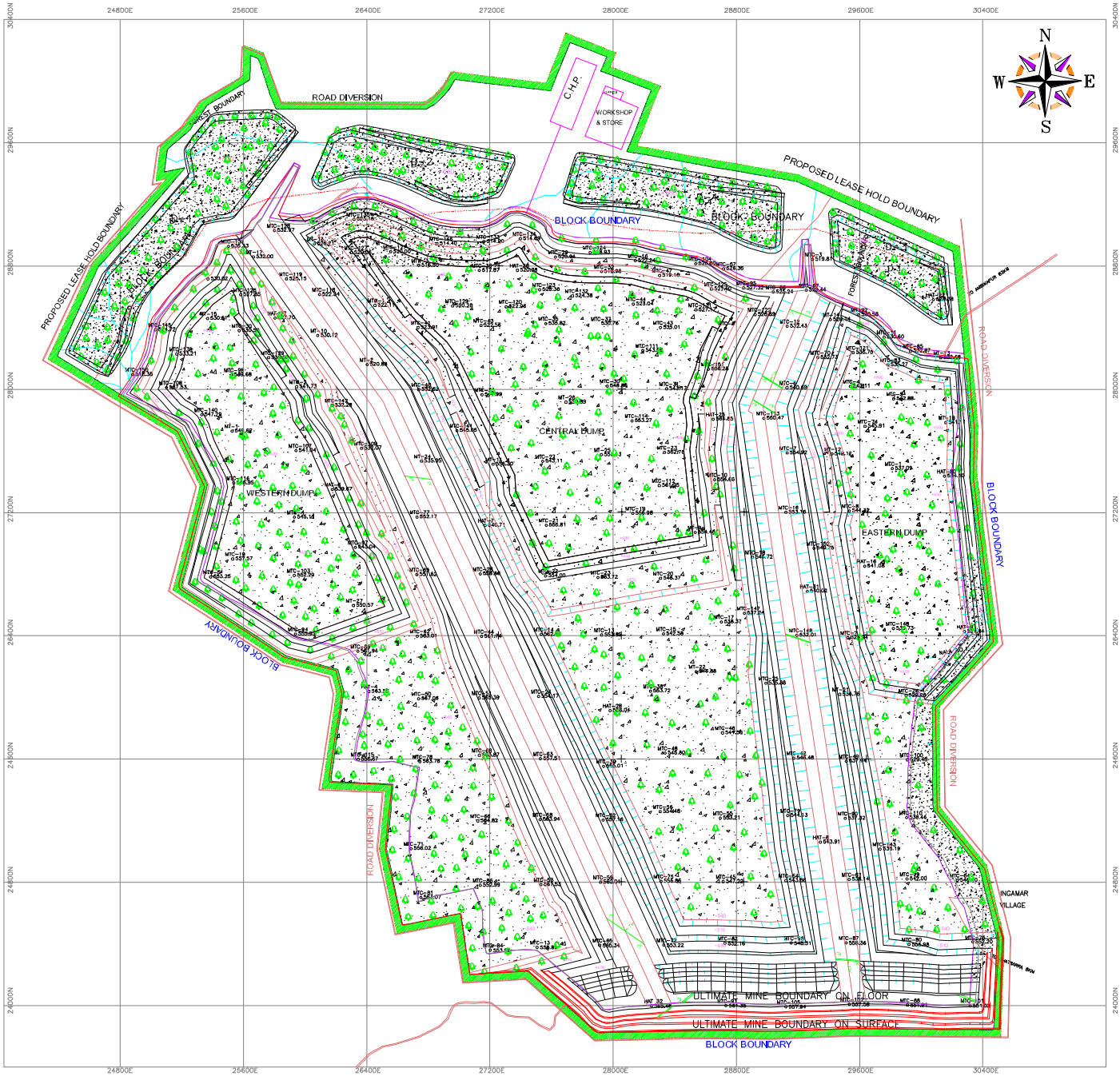
(a) Gentle gradient of seam floor, viz. 2° - 3°.

(b) Average thickness of the parting between seam III and overlying Seam IV being of the order of 30-35 m which can be very easily handled by dragline with side casting.

(c) Least cost of production

Mine Drainage

- During the rainy season, water will be allowed to accumulate in the sump on the floor of seam IIIB.
- Sumps are provided for the dewatering pumps which will transfer in-pit water for controlled discharge off the site.



LEGEND

PARTICULARS	SYMBOL
SURFACE CONTOUR	
BOREHOLE NO WITH SURFACE RL	MT-16 541.08
BLOCK BOUNDARY	
BACKFILLING	
RIVER/NALA	
FLOOR CONTOUR	
LEASE HOLD BOUNDARY	
SURFACE DUMP	D-2
PLANTATION	
WATER BODY	
PLANTATION	

0 250 500 750 1000M

SCALE

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CLIENT: C.M.D.C.

PROJECT: TARA COAL BLOCK

TITLE: SUMMARY
CONCEPTUAL PLAN

DRAWN BY: B.R. MATLOTIA	CHECKED BY: B.D. SHARMA	FIG. NO.
SCALE : AS SHOWN	DATE : 12-07-2007	2

Drilling and blasting

The standard practice involving the electric detonators for the initiation of detonating cord, detonating relays to achieve hole to hole delays, use of Heavy ANFO, and slurry or emulsion explosives as the column charge will be used for Blasting.

Blast hole drills of 250 mm and 160 mm dia will be used for drilling in OB/partings and coal benches

2.4 Equipment selection

The main mining and transport equipment requirement for operation are given in Table 2.

TABLE 2
MAIN MINING EQUIPMENT

Sl. No.	Equipment	Size	Quantity
	Overburden		
1.	Walking Draglines	24/96	2
2.	Rope/Hydraulic Shovels	10 cum	5
3.	Hydraulic Shovels	4.5 cum	1
4.	Rear Dumpers	100 T	35
5.	Rear Dumpers	35 T	6
6.	RBH Drills	250 mm	9
7.	RBH Drills	160 mm	1
8.	Dozers	850 HP	2
9.	Dozers	320 HP	7
	Coal		
1.	Hydraulic Shovels	4.5 cum	3
2.	Rear Dumpers	35 T	21
3.	RBH Drills	160 mm	3
4.	Dozers	320 HP	2
5.	Wheel Dozers	350 HP	4
	Common		
1.	FE Loader	5-6 cum	2
2.	FE Loader	1-2 cum	1
3.	Dozers	320 HP	1
4.	Water Sprinkler	28 KL	3
5.	Hydraulic Backhoe	1.0 cum	2
6.	Tipping Trucks	8 T	4
7.	Mobile Cranes	40/18/8 T	3

2.5 Site and Service

CMDC will provide the infrastructure necessary for its operations e.g. roads, office communication, potable and industrial water supplies etc.

***Power supply, fuel consumption and communication system*:**

Project will get power from CSEB substation and power will be distributed at 33 kVA. The fuel consumption will be for diesel operated machinery to the tune of 64.2 TPD for three shift working. Surface Mine Communication System, Mine Management Information System, internet, LAN facilities will be provided.

Man Power:

The annual working days will be 330 with 3 shifts of 8 hours each. The total manpower for producing 6.0 MTPA coal is estimated as 1903 for options IA, 1658 for options IB and 356 for options II.

Water Requirement:

Total water requirement is 1110.5 KLD. The water requirement will be met from the mine sump for industrial uses and from bore well for drinking and sanitation.

3.0 PRESENT ENVIRONMENTAL SCENARIO

3.1 Topography, drainage and climate

The core zone occupies the highest elevated area of the entire study circle from where the drainage eminates in all the directions. The elevation of study area is between 400 – 570 a.m.s.l. The entire study area is hilly and densely forested having rolling and undulating topography.

Atem river is the main river which flows north west ward and is located in north eastern segment of the study area. The river is a perennial river while other nalas are seasonal in nature. The main nalas are Manasi, Jatmar nala Vijaura Nala, Dohka nala and Rumrabahar nala. The nalas of the study area overflow their bank during monsoon season and remains dry in summer

The summer is from March to June when the temperature varies from 10°C during night to 40°C during day, on an average. Mid June to September is the rainy season and from October the winter sets in and continues upto February. During winter season, the temperature varies from 3.5°C during night to about 31°C during day. The climate of the area can be described as dry to moist tropical. The average rainfall is 1558.9mm and relative humidity varies from 24 to 88%.

3.2 Micro-meteorological survey

The meteorological station was set up at Kajri. The observed values of various parameters are as follows:

TABLE 3
SUMMARY OF MICROMETEOROLOGICAL DATA
(MARCH 2005 TO MAY 2005)

Parameter	Maximum	Minimum	Mean
Temperature (°C)	40.9	11.0	23.11
Relative Humidity (%)	83.9	21.0	60.60
Wind speed (km/hr)	15.80	0	3.79
Wind direction*	Predominant wind direction is from N (18.15%)		

**mean of all directions including calm*

3.3 Ecology

As the study area occupies the upper reaches of the catchment, no major surface water source exists nearby.
Barring some patches of revenue lands (17.2% of the ML area) entire core zone is forest land (82.8%), covered under the category of dense mixed jungle, mainly of Sal.

The area is thickly forested towards north, west and south in comparison to the eastern side of the study area.

There is no National Park and Sanctuary in this forest division while the Protected and Reserved forests of the study area host a variety of faunal species. The study area has low density of wild fauna.

Pulses, paddy and maize are also sown besides the main crops followed by wheat and oil seeds.

3.4 Hydrological conditions

The study area is occupied by lower Chhattisgarh consists of arkose, conglomerate, sandstone and siltstone, which are compact formations. The groundwater in these formations generally occurs within secondary porosity of the formation formed by fracture and joints. The annual ground water recharge of the study area will be 75.06Mcm.

The depth to groundwater over the area is highly variable, ranging between 5.0 to 12.0 m below the ground level depending upon the elevation of ground level. The seasonal fluctuation of the water table is moderately high varying between 1.5 to 8.5 m annually.

3.5 Quality of water

To evaluate the quality of water resources of the study area, ten water samples were taken - nine for ground water and one for surface water The

water is soft with low iron and low sulphate content. The ground as well as surface water is potable and the various parameters are well within the desirable limits for human consumption. The water can be used for drinking, domestic and industrial purposes.

3.6 Ambient air quality, noise level and traffic density

Twenty four hour average SPM levels were generally found to be below 200 µg/m^3 at all the locations. The concentrations of SO_2 and NOx are considerably low compared to the 80 µg/m^3 NAAQS limit for residential, rural and other areas. The concentrations of respirable particulate matter (RPM) is within limits of 100 µg/m^3, the National Ambient Air Quality Standard for residential areas.

Noise levels were observed in and around the M.L. area using second level meters at 4 locations. The noise level during night and day both are well within specified permissible limit of residential area ranging between 37.10 and 47.4 dB(A).

Traffic density was observed over 24 hour period on 17 & 18 May 2005 near Tara village on Bilaspur-Ambikapur highway. The traffic density of motorised vehicles is 785 per day.

3.7 Land use pattern

The mining lease area of 2778.19 Ha has rugged, undulating topography. About 83% of the geological block area falls under forest area. There are 30 villages falling in 2 Tehsils of Sargiya district of Chhattisgarh State as per census 2001. Details of land use pattern in the buffer zone is given in Table 4.

TABLE 4
LAND USE PATTERN OF BUFFER ZONE

Land use	Area Ha.	Percentage
Irrigated Land	160.00	0.26
Unirrigated Land	5996.00	9.77
Culturable waste	5571.00	9.07
Area not available for cultivation	1592.00	2.59
Forest land	48081.80	78.31
Total	**61400.8**	**100**

3.8 Socio-economic conditions

The population density in the study area is 38.6 persons per sq.km. The male population constitutes 51.2%. There are 951 females per 1000 males. SC percentage is 3.77 while ST constitutes bulk of population (67.76%). The average literacy is 42.3% which is quite low. The literacy among women is still poorer at 31.3%. Nearly half the population is non worker out of which around half are children of age below 6 years. Agriculture and its related activities are the main occupation of the people

Mining will result in loss of agricultural land of few farmers and houses of residents. The service sector will raise some employment of local people by ancillary activities like transportation and supply of consumer goods to the mine.

3.9 Place of tourism/religious/historical interest

There are no places of historical/tourist/religious and archaeological importance in either core zone or study area.

4.0 ENVIRONMENTAL IMPACT ANALYSIS

4.1 Air quality

The various pollutants like SPM, SO_2 and NO_x are not expected to have considerable variation from the existing levels within the study area which are generally below the limits specified for "residential and rural use areas" The pollutant levels within the ML boundary will rise considerably but are expected to conform to the permissible limits for "industrial use" with proper mitigation measures. Source of SPM in open cast mine is due to excavation, transportation, handling, drilling, blasting, loading and hauling operation.

4.2 Water resources

Surface water

The ML area is one of the highest points in the study area, hence, rainwater run off streams originate from this area. Two of these are prominent- Garjar Nala in the north and another anonymous nala in the south eastern part of the block. Both of these nalas will get excavated out. Since these are first order nalas, their excavation will not adversely affect the surface water regime to a significant extent. The rain water would in future get collected into the mine sump which will aid in ground water recharge and also be available for use in mine. No surface water sources are available nearby for utilisation for industrial or domestic activities.

Ground water

The daily requirement of water for various mining activity, colony and peripheral villages has been estimated as1110.5 m^3/day. The entire drinking water need will be fulfilled through ground water. The water requirement of mining related activity will be met through mine sump water. The mine sump water will include seepage from formation as well as rain water.

4.3 Water quality

The surface water quality is likely to be affected with higher load of suspended solids by the following :

- Wash off from dumps
- Soil erosion from mine and roads
- Pumping out mine water to surface water channels

The mining activity will touch the water table during mining. The average water table in the area is between 5-12 m below ground level.

4.4 Land degradation

Out of total ML area of 2778.19 Ha, substantial area will be degraded due to mining of coal and dumping of over burden. Such degradation is a common phenomenon under open cast mining for which necessary mitigation measures will be taken up. The disturbed area will comprise excavated land, external dumps, infrastructure, roads etc.

4.5 Ecological impact

Fauna may move away due to noise, vibrations and destruction of forest. No adverse impact on agricultural crops is anticipated as the core area virtually does not have agriculture land.

4.6 Noise level and ground vibration

Ambient noise levels in the core area are likely to increase from deployment of additional noise generating equipment like Heavy Earth Moving Machines, drills, higher blasting and crushing operations. A level of 90 dB(A) is considered as safe for 8 hours of exposure. With proper maintenance the noise levels around most machines will be within optimum limits.

The blasting operation may generate vibration, which at present is nil. Precautionary measures will be adopted.

4.7 Socio economic impact

The loss of agricultural land for mining will change the economy from farming based to secondary and tertiary activity based. Proper and sensitive resettlement and rehabilitation of displaced persons can create more opportunities for urbanization, education and self employment

5.0 ENVIRONMENTAL MANAGEMENT PLAN

In order to mitigate the environmental impact due to mining and its allied activities, a comprehensive Environmental Management Plan (EMP) has been formulated. All likely parameters that will be affected by mining have been addressed and these briefly mentioned in the following paragraphs.

5.1 Land degradation control measures

The post mining land use within ML area are indicated in Table 5.

TABLE 5
POST MINING LAND USE WITH ENVIRONMENT MANAGEMENT

Purpose	1st yr	5th yr	10th yr	20th yr	Conceptual
1. Excavation without backfilling	8.09	227.12	334.24	470.45	970.86
2. Overburden / Dumps	74.08	188.16	188.16	603.19	188.16
3. Backfill	0	42.63	286.63	603.19	1260.14
4. Infrastructure (Workshop, office & store)	8.22	8.22	8.22	8.22	8.22
5. Peripheral Green belt	21.36	106.8	106.8	106.8	106.8
6. Coal handling plant / mineral separation plant	6.71	6.71	6.71	6.71	6.71
7. Virgin area	2422.43	1961.25	1610.13	1157.36	0
8. Others	237.3	237.3	237.3	237.3	237.3
Total	**2778.19**	**2778.19**	**2778.19**	**2778.19**	**2778.19**
9. Area to be excavated	8.09	269.75	620.87	1073.64	2231.00
10. Plantation over backfill	0.00	0.00	191.87	465.34	1260.14
11. Plantation over dumps		74.08	188.16	188.16	188.16

5.2 Air pollution control measures

Dust suppression systems (like water spraying) and Dust extraction systems will be used while construction. Transport vehicles shall be maintained leak proof. Dust collectors will be used.

5.3 Control measures for water pollution

To prevent water pollution by oil/grease and sewage waste leak proof containers will be used for storage and transportation of oil/grease separate drains will be constructed for storm water and sewage. Workshop effluent will pass through oil grease trap and re-circulated resulting into zero discharge.

5.4 Conservation of Soil

For conservation of soil Garland drains, check dams, retaining walls, local stone paved chutes and channels will be provided and plantation would be carried out on inactive dump slopes.

5.5 Solid waste management

Overburden and sludge created by the mine water in settling pond will be used as backfilling. Oil and grease from oil/ water separator and domestic solid waste will be recycled by vendor. Organic waste and biological sludge from STP will be composted for manure.

5.6 Ecology

Compensatory afforestation will be undertaken as per the compensatory afforestation plan. The minimum plantation of 7.5 m wide all around proposed M.L. will be undertaken on the statutory barrier. A nursery will be established at the site. The selection of the suitable local and diverse species for development of green belt will be made.

5.7 Noise and vibration management measures

Thick tree belts will be planted to screen noise. No drills would be used in opencast mine and provision of air silencers will be there to modulate the noise generated by the machines.

5.8 Socio-economic

The land will be acquired under Land Acquisition Act and land oustees will be paid compensation as per Govt. rules. A R&R plan as per State Government norms would be prepared with proper compensation for deprived people of ML area.

6.0 ENVIRONMENTAL CONTROL AND MONITORING ORGANISATION

An environmental cell has been proposed to take care of pollution monitoring aspects and implementation of control measures. The head of this cell will be environmental engineer. A schedule has been spelt out for periodical monitoring. The total investment towards environmental protection will be 180.71 lakh per year and the total investment on environmental improvement works is envisaged as Rs.729.72 lakh.