BICHARPUR COAL BLOCK
SUMMARY OF ENVIRONMENTAL IMPACT ASSESSMENT

1.0 Project Location and Project Description

1.1 The Government of India, Ministry of Coal has allotted Bicharpur Coal Block, over an area of 500 ha to the Madhya Pradesh State Mining Corporation Ltd. for non-power sector / merchandise mining. The block is located in Sohagpur Coalfield, Shahdol district, Madhya Pradesh. The geographical location of the block is given at Figure 1 of this document.

1.2 The area of block is a flat terrain with slightly undulating lands going up to level of 483 mRL in the Western and SW part. The block area generally slopes towards north with altitude going down to 450 mRL.

1.3 The proposed lease area does not have any perennial water courses. A nalla called Lotna nalla flows almost in the middle of the property towards North. It confluences with Murna Nalla, near northern boundary of the proposed lease. The latter nalla eventually meets Son river which controls drainage of the area.

1.4 The Sohagpur Coalfield is part of large sediments filled Gondwana trough in Son river basin. The block area is generally covered by soil and alluvium, with rock exposures only along nalla cuttings. Coal is not exposed anywhere in the block. Hence the geology of block is derived from exploratory drilling.

1.5 The detailed exploration of the block was carried out by M/s Naresh Kumar & Company Pvt. Ltd. However, occurrence of coal was earlier proved by two borehole drilled by GSI. The exploration was carried out between May 2010 and March 2011. A total of 45 boreholes were drilled. The four coal seams occurring in block were proved by drilling.

1.6 Out of four coal seams, three are workable and have geological reserves 53.39 Mt. Out of this mineable reserves are 29.12 Mt. The minimum depth of the coal working will be 121 m while maximum will be 270 m. The gradient of seams is almost flat being 1º to 4º towards North.

1.7 The mine will be an underground coal mine. There are no major faults in the block area. The coal seams will be approached by a pair of inclined drifts driven at gradient 1 in 5. They will be driven so as to touch all the three workable seams one after another. For ventilation return air, a shaft will be sunk, while both inclines will be intake airways.

1.8 Since gradient of coal seams is almost flat, the coal will be won by continuous miners. The mine is planned on Bord and Pillar method. The IV seam will be developed on this pattern and will be left sealed. The two seams below, namely III A and II seams, will be developed so that galleries and pillars are superimposed. However, they will be extracted by a method called NEW (Non extractive Width) method. In this method, width of extraction is interspaced by solid pillars designed in such a way that subsidence does not reach the surface. The method of extraction is shown at Figure 4 of this document.

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1.9 The coal will be brought out of the mine by a conveyor running in the drift. The conveyor will deliver coal to an overhead bunker from where it will be despatched to the siding, about 2 km away, by closed dumpers. No washery is proposed at the mine.

1.10 All required site services including colony will be located are 15.39 ha. of land. Out of this, 4.83 ha. will be within the lease while 11.56 ha. will be just outside SW boundary. Colony is also proposed within the same area.

1.11 The life of the mine will be 41 years, including development. The coal extracted will be 29.12 Mt which will 55% of net geological reserves.

2.0 Description of Environment
2.1 The proposed lease area / block is flat with stope towards North. There is one village – Bicharpur within the block area. However, since there will be no subsidence the village will not be affected. The company will acquire 4.83 ha. of land within block area and 10.56 adjacent land outside, a total of 15.39 ha, for surface infrastructure and colony.

2.2 There are a total of 78 census villages and one urban area Shahdol with 10 km radium buffer zone from boundary of the block. The total land of area of these villages is 34,165 ha. as per 2001 Census. The area buffer zone becomes 41,121 ha. after addition of area of Reserved and Protected Forests, which were measured at 6956 ha. In addition there are 8290 ha. of revenue forest lands within the buffer zone.

2.3 Out of this land area 19,856 ha. is cultivated land which is 48.3% of area of buffer zone area. Forests of all types account for 15,246 ha. or 37.0% of land area.

2.4 The proposed lease area has 75.750 ha. of protected forest and 35.061 ha. of Govt. Revenue Forests, both of which are highly degraded. The Shahdol town occupies a part, nearly 44 ha., of land of the proposed lease.

2.5 The area experiences good rainfall, averaging over 1250 mm per year. The climate is hot during summer and cold during winter. The summer temperatures are usually above 40ºC during months from April to June. The winter temperatures are usually below 10º with temperature of 0º being recorded. The relative humidity recorded is usually above 50% except during April and May. Even during these months, the relative humidity recorded does not go below 25%. The wind velocities are usually below 5 kmph during months between October to January. The velocities recorded increase in February & March and continue the increase from April to September. Calm periods are usually low.

2.6 The water courses in the lease area are seasonal except Murna Nalla which only have pools of water during summer. The ground water resources, of both core and buffer zone, are mainly due to rain water percolation. The catchment area of core zone is 90 sq. km. and ground water recharge is 9 MCM. The ground water levels during pre monsoon vary from 4.67 m to 9.02 m while during post monsoon they are 1.54 m to 6.48 m. The ground water use is around 30%, very much below the safe level of 70%.

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2.7 The quality of water was analysed for six surfaces and four ground water sources. Except for coliforms in all surface waters and two dug well water, all the quality parameters were below desirable levels of drinking water standards. Obviously, the waters of the area are free from pollution.

2.8 The ambient air quality was monitored at six locations, including one within the proposed lease area. The parameters PM10, and PM 2.5, were very much below prescribed limits for rural areas while Nitrogen dioxide, \( \text{SO}_2 \) and Carbon Monoxide were very much below their prescribed limits. Remaining parameters were found either absent or below detectable levels. Dust fall measurements carried out at two locations and values were low, 5.2 t/km²/month & 14.8 t/km²/month.

2.9 Noise levels were monitored at six locations. The noise levels recorded were low, usually below 55 dB(A). Little higher noise levels were recorded at two locations near highways.

2.10 The soil quality of agricultural land showed medium fertility and even barren land was approaching to this level.

2.11 There are no National Parks, Sanctuaries, Biosphere reserves, migratory corridors or any other eco sensitive areas within 50 km from boundary of proposed lease area. A flora fauna survey was undertaken in core and buffer zone area. The forests are fairly degraded. There are no endemic species of flora nor any endangered one. The fauna in the area is also fairly common and not much variety is found.

2.12 The traffic survey indicated that, major traffic on the roads, even National Highway from Katni to Annupur, was of two wheelers and three wheelers which accounted for 50% on National Highway and upto 75% on the other road surveyed.

3.0 Anticipated Environmental Impact and Mitigation Measures

3.1 The mine will be worked by underground method at depth varying from 130 m to 270 m. The coal extraction will be done in such a way that there will not be any surface subsidence. Thus land can be continued to be used for existing purposes by the land owners.

3.2 Only 15.39 ha. of agricultural land will be acquired for infrastructure and colony. Thus impact on land will be negligible. All owners of 15.39 ha. of acquired land, will be offered jobs, if they are prepared to work in an underground mine. Thus R & R are involved is limited.

3.3 The impact on Air Quality will be limited. Main causes will be handling of coal at surface, its transport to siding and handling at siding. Adequate arrangement for spraying water will be done at all transfer and storage points. The transportation to siding will be done through closed dumpers.

3.4 The only cause of water pollution will be suspended solids in water pumped out from the mine. These will be removed through settling tanks, before discharging water to surface water courses.

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3.5 Blasting will not be regularly undertaken at this mine. In any case, blasting at depths beyond 130 m will have very little impact on surface. The impact on noise levels will only be due to handling of coal at surface. The whole of acquired surface area will be surrounded by a green belt to reduce the noise and control dispersion of dust.

3.6 Since only 15.39 ha. land will be acquired and there will be no surface subsidence due to Mining Operations, no land will be affected. Hence there will be no impact on soil quality.

3.7 Since the coal will be despatched by rail, the only increase in traffic will be on the road from mine to railway siding. The management will examine alternatives to reduce the increased traffic.

3.8 Mine Closure Plan
The life of the mine will be 41 years. The underground working of seams will be done from top to bottom. As soon as working in a seam is over, entries to that seam from the two approach inclines will be sealed by explosion proof sloppings. When extraction is complete from all coal seams, the inclines and one shaft from surface will be sealed after bringing out all equipment from the mine.

The remaining surface land with colony and other infrastructure, the surface infrastructure that cannot be used by the local community will be dismantled. The colony, perhaps, will have a ready market due to expansion of Shahdol City.

4.0 Environmental Monitoring Programme
4.1 The environmental Monitoring Programme proposed is as under:
   a) Quarterly monitoring of PM$_{10}$ and PM$_{2.5}$, for eight hours at three stations, including one at downwind side of railway siding. Full 24 hr monitoring once in a year for all 12 parameters at two stations.
   b) Monthly monitoring of water overflowing settling tanks for pH, suspended solids, total dissolved solids and analysed for all 37 parameters once a year.
   c) Monthly monitoring of noise levels at predetermined locations.

4.2 Except monitoring of noise levels, other jobs will be outsourced.

5.0 Additional Studies
5.1 Besides Public Consultations, a Social Impact Assessment study was undertaken in village within and surrounding lease area. For purpose of survey, eight villages within four km radius zone of the proposed lease area were selected. It also covered ward No. 29 of Shahdol down which was partly within the block. The 2001 Census data was collected and analysed. In order to update the data a sample survey of 350 households was carried out on various parameters like male-female ratio, population, type and size of families, income data, literacy, infrastructural facilities, connectivity, post and telephone facilities and civic amenities.

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5.2 The survey has been utilized to draw out a corporate Social Responsibility Programme based on interaction with villagers. Besides the household survey, group discussions and Focus Group Discussions (FGD) were held with the villagers groups. The programme includes, measures to improve income of Agricultural families, Measures to improve health facilities, drinking water supply, community infrastructure, entrepreneurship development, skill development etc.

5.3 A total expenditure of Rs. 7.5 crores on capital account and 1.87 crore on revenue expenditure has been planned during first five years. Details have been drawn on expenditure on major heads and sub heads and are included to this document as Annexures and are summarised below:

### A. Capital Budget

<table>
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<th>Sr. No.</th>
<th>Details of Head / Need</th>
<th>(Rs. Lakh)</th>
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<tr>
<td>i)</td>
<td>Increasing Awareness</td>
<td>28.95</td>
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<td>ii)</td>
<td>Awareness of Agriculture Development</td>
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<td>iii)</td>
<td>Animal Husbandry &amp; Dairy</td>
<td>189.00</td>
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<td>iv)</td>
<td>Social Forestry &amp; Agriculture</td>
<td>65.10</td>
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<td>v)</td>
<td>Health</td>
<td>78.90</td>
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<td>vi)</td>
<td>Drinking Water</td>
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<td>vii)</td>
<td>Community Infrastructure</td>
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<td>viii)</td>
<td>Education</td>
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<td>ix)</td>
<td>Entrepreneurship Development</td>
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<td>x)</td>
<td>Infrastructure for Games &amp; Sports</td>
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<td><strong>Total</strong></td>
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### B. CSR Activities under Revenue Account

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<tr>
<td>i)</td>
<td>Promotion General Awareness</td>
<td>2.50</td>
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<tr>
<td>ii)</td>
<td>Strengthen off Farm and Non Farm Occupation</td>
<td>11.50</td>
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<tr>
<td>iii)</td>
<td>Promote Modular employable skill</td>
<td>7.50</td>
</tr>
<tr>
<td>iv)</td>
<td>Promote Non Modular employable skill</td>
<td>7.30</td>
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<td>v)</td>
<td>Strengthen Extension Services</td>
<td>21.19</td>
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<tr>
<td>vi)</td>
<td>Education &amp; Functional literacy</td>
<td>70.79</td>
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<tr>
<td>vii)</td>
<td>Improve Health Facilities</td>
<td>45.30</td>
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<tr>
<td>viii)</td>
<td>_______ Amenities</td>
<td>4.00</td>
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<td>ix)</td>
<td>Community Development</td>
<td>7.35</td>
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<tr>
<td>x)</td>
<td>Maintenance &amp; Miscellaneous Expenditure</td>
<td>10.07</td>
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<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>187.50</strong></td>
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6.0  Project Benefits
6.1 The project will supply 0.75 Mt of coal per annum for nearly 40 years. With country’s energy demand increasing, this will be a good contribution to company’s economy.

6.2 The mine will be a fully mechanized underground coal mine with a high productivity. It will help the nation to run such highly productive underground mines in future.

6.3 The project will employ 577 persons directly, out of which 40 will be unskilled jobs for which only locals will be employed. A good number of jobs will be created in secondary and Tertiary Sector.

6.4 The company proposes to spend substantial amount for CSR activities, details of which are described in para 7.5 of this document.

7.0  EMP / Environment Management Plan
7.1 The plan of Environment Monitoring is already detailed in para 11.4 above.

7.2 The mine will be a mechanised underground mine and under Coal Mines Regulations, 1957 will have to appoint a full time Safety Officer with specified qualifications and experience. He will also given responsibility of Environment Management. He will be given special training in Environment Management.

7.3 It will be his duty to ensure that
   a. Environment Monitoring is carried out as per schedule and maintain records of the same.
   b. He will ensure that dust suppression measure at surface and underground are properly functioning.
   c. He will ensure that settling ponds are cleaned regularly.
   d. Draw out programme for plantation and monitor the same.
   e. He will ensure that any deficiencies are brought to the notice of the manager
   f. Send reports of monitoring to State PCB and MoEF as per their stipulations

7.4 He will directly report to the Mines Manager to whom he will give a regular status report on Environment. He will also convene a meeting of Sr. Officials every six months to discuss the status of Environment.