## EXECUTIVE SUMMARY

The salient features of the project are given below:

<table>
<thead>
<tr>
<th><strong>Project name</strong></th>
<th>Chasnalla Colliery with production of coal @ Nominal 1.2 MTPA / Peak 1.5 MTPA along with expansion of Coal Washery to 4.0 MTPA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project proponent</strong></td>
<td>M/s Steel Authority of India Ltd</td>
</tr>
<tr>
<td><strong>Block Allottees</strong></td>
<td>Chasnalla Colliery has been in operation prior to nationalization. There are two mouzas under Chasnalla Colliery viz. Chasnalla Mouza (Area: 266.80 ha) &amp; Het Kandra Mouza (Area: 81.38 ha) allotted to SAIL.</td>
</tr>
<tr>
<td><strong>Villages in the ML area</strong></td>
<td>Chasnalla, Het Kandra</td>
</tr>
<tr>
<td><strong>Latitude</strong></td>
<td>23°40'03'':23°38'33&quot;N</td>
</tr>
<tr>
<td><strong>Longitude</strong></td>
<td>86°26'52'':86°27'57&quot;E</td>
</tr>
<tr>
<td><strong>Total ML Area</strong></td>
<td>Original Lease Area of Mine = 348.18 Ha out of which about 243.50 Ha has become part of approved Mining Plan Project Area of Tasra Opencast Project which incidentally encompasses Deep Mine, Upper Seam, part of West Quarry &amp; the existing Washery. Now for taking Environmental Clearance for Chasnalla Colliery, an area of about 230.88 Ha has been proposed as Chasnalla Area covering Deep Mine, Upper Seam, part of West Quarry &amp; the existing Washery, by including part of Tasra Project Area into Chasnalla Area leaving aside Tasra Mine Pit Area intact. Proposed Chasnalla Mine Area = 230.88 Ha Area of washery = Approx 16.5 ha (Existing- 12.5 Ha; New-4.0 Ha) N.B. - Existing &amp; proposed new washery area falls under the lease hold area of Chasnalla.</td>
</tr>
<tr>
<td><strong>Capacity</strong></td>
<td>Proposed ROM from Mine @ Nominal 1.2 MTPA / Peak 1.5 MTPA Proposed washery throughput = 4 MTPA (Expansion of existing washery to 2.8 MTPA and setting up of New washery of 1.2 MTPA capacity)</td>
</tr>
<tr>
<td><strong>Land ownership break up</strong></td>
<td>i) Company Land (SAIL) = 225.00 Ha (Acquired/ Purchased/ Transferred)</td>
</tr>
<tr>
<td>Section</td>
<td>Details</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>ii) Govt. Land</td>
<td>83.43 Ha</td>
</tr>
<tr>
<td>iii) Private Land</td>
<td>39.75 Ha</td>
</tr>
<tr>
<td>iv) Forest</td>
<td>Nil</td>
</tr>
<tr>
<td>Total</td>
<td>348.18 Ha (Original Lease Area of Mine)</td>
</tr>
<tr>
<td>Reserve</td>
<td>Balance approximate present geological reserve (as on 31-03-2014): i) Lower Seams- 14.7 Million Tonnes</td>
</tr>
<tr>
<td></td>
<td>ii) Upper Seams - 6.88 Million Tonnes</td>
</tr>
<tr>
<td>Rated capacity</td>
<td>Proposed ROM from Mine @ Nominal 1.2 MTPA / Peak 1.5 MTPA</td>
</tr>
<tr>
<td></td>
<td>Proposed washery throughput = 4 MTPA (Expansion of existing washery to 2.8 MTPA and setting up of New washery of 1.2 MTPA capacity)</td>
</tr>
<tr>
<td>Life of the mine</td>
<td>Presently proposed to be 10 years @ Nominal 1.2 MTPA / Peak 1.5 MTPA (May be modified as per the Mining Plan which is under preparation)</td>
</tr>
<tr>
<td>Method of Mining</td>
<td>Mainly Underground, partly Opencast</td>
</tr>
<tr>
<td>Blasting</td>
<td>Short delay detonators</td>
</tr>
<tr>
<td>Storage of explosives</td>
<td>03 magazines of capacity 800 kg, 1361 kg &amp; 2622 kg respectively</td>
</tr>
<tr>
<td>Working days</td>
<td>300</td>
</tr>
<tr>
<td>Manpower</td>
<td>621 (as on 31/03/2014)</td>
</tr>
<tr>
<td>Transportation</td>
<td>From the mine to washery through conveyor belts. The washed coal is transported to Steel Plants by Rail.</td>
</tr>
<tr>
<td>Expected cost of the project</td>
<td>The indicative total capital cost estimate for enhancement of colliery capacity to @ Nominal 1.2 MTPA / Peak 1.5 MTPA is estimated at 150 crores &amp; the up-gradation of existing washery to 2.8 Mtpa and setting up of 1.2 Mtpa coking coal washery is estimated at Rs. 300 crore.</td>
</tr>
<tr>
<td>Elevation</td>
<td>The altitude varies from +120m to +170 m AMSL within the area (as per Survey of India Topo Sheets 1:10,000).</td>
</tr>
<tr>
<td>Topography</td>
<td>The area is broadly characterized by an undulating to a plain country. The colliery area has a general south-easterly slope.</td>
</tr>
<tr>
<td>Water requirement</td>
<td>Washery – 6400 KLD</td>
</tr>
<tr>
<td></td>
<td>Domestic- 1660 KLD</td>
</tr>
<tr>
<td></td>
<td>Mining - 300 KLD</td>
</tr>
<tr>
<td>Source of water</td>
<td>Sources : Domestic : Damodar River Industrial: Mines pit</td>
</tr>
<tr>
<td>----------------</td>
<td>----------------------------------------------------------</td>
</tr>
<tr>
<td>Power requirement and Source</td>
<td>Power is supplied to the Chasnalla Colliery through 33kV O/h line from DVC substation. Normal usage is within 7.2-7.3 MVA &amp; peak hour usage (In monsoon season) being 8 MVA. There will be additional requirement of connected load of 7642 kW (approx.) for the new 1.2 MTPA washery plant which will also be sourced from HT Power supply system from DVC. Specific power consumption for normal operation will be less than 15 KWH/t of raw coal throughput.</td>
</tr>
</tbody>
</table>

2.0 INTRODUCTION

2.1 Identification of project and project proponent

The applicant is the Collieries Division of Steel Authority of India Limited having its Registered Office at Ispat Bhavan, Lodi Road, New Delhi –110 003. At present, there are the following three working coal mines of Collieries Division of SAIL for providing coking coals to its steel plants:


Background of the company

Steel Authority of India Limited is one of the top steel producers in the world with a turnover of more than Rs. 50,000 Crores. The company is among the seven Maharatnas of the country's Central Public Sector Enterprises. SAIL has five integrated steel plants, three steel special plants, and one subsidiary in different parts of the country.

SAIL traces its origin to the formative years of an emerging nation - India. After independence the builders of modern India worked with a vision - to lay the infrastructure for rapid industrialisation of the country. The steel sector was to propel the economic growth. Hindustan Steel Private Limited was set up on January 19, 1954.
Hindustan Steel (HSL) was initially designed to manage only one plant that was coming up at Rourkela. For Bhilai and Durgapur Steel Plants, the preliminary work was done by the Iron and Steel Ministry. From April 1957, the supervision and control of these two steel plants were also transferred to Hindustan Steel.

The Ministry of Steel and Mines drafted a policy statement to evolve a new model for managing industry. The policy statement was presented to the Parliament on December 2, 1972. On this basis the concept of creating a holding company to manage inputs and outputs under one umbrella was mooted. This led to the formation of Steel Authority of India Ltd. The company, incorporated on January 24, 1973 with an authorized capital of Rs. 2000 crore, was made responsible for managing five integrated steel plants at Bhilai, Bokaro, Durgapur, Rourkela and Burnpur, the Alloy Steel Plant and the Salem Steel Plant. In 1978 SAIL was restructured as an operating company.

Since its inception, SAIL has been instrumental in laying a sound infrastructure for the industrial development of the country. Besides, it has immensely contributed to the development of technical and managerial expertise. It has triggered the secondary and tertiary waves of economic growth by continuously providing the inputs for the consuming industry.

Modernisation & Expansion

SAIL, is in the process of modernizing and expanding its production units, raw material resources and other facilities to maintain its dominant position in the Indian steel market. The objective is to enhance the production capacity to 23.46 MTPA of Hot Metal from the installed production capacity of 13.8 MTPA.

2.2 Brief description of nature of the project

Chasnalla Coal Complex basically comprised of 2 opencast projects (West Quarry & East Quarry) and 2 underground Projects (Deep Mines & Upper Seam Project, both being degree three gassy mines) apart from a centralized Coal Washery for coal Preparation.

Presently Deep Mine, Upper Seam, West Quarry & Washery are in operation. Area of East Quarry has now been included in Mining Plan Pit Area of Tasra Opencast Project. It has been proposed to enhance colliery capacity as per Mining Plan of a total colliery capacity of @ Nominal 1.2 MTPA / Peak 1.5 MTPA, which is under preparation.

Additionally, it has been proposed to upgrade the capacity of existing coal washery to 2.8 MTPA and to setup a new 1.2 MTPA Coking Coal Washery at Chasnalla. Existing washery as well as proposed new washery area falls under the lease hold area of Chasnalla Colliery.

2.3 Need for the project and its importance to the country and / or region

Coal produced from Chasnalla & Jitpur coal Mines is sent to SAIL Steel Plants after being washed at Chasnalla Coal Washery. The present requirement and supply of coking coal to SAIL steel plants are as under:-
### Coking coal Requirement (in Million Ton)

<table>
<thead>
<tr>
<th></th>
<th>Indigenous supply</th>
<th>Imported coal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before expansion</td>
<td>13.30 (30%)</td>
<td>9.30 (70%)</td>
</tr>
</tbody>
</table>

Out of above, about 0.5-0.60 mill tones of prime coking coal is available from own sources of SAIL i.e. from Chasnalla & Jitpur Collieries. The balance quantities of about 3.5 mill tons of coal is being supplied from CIL sources.

Steel is one of the core industries of the country. It is a critical input to other industries including construction industry, automobiles sector, railways & hosts of other industries. One of the important raw materials for steel making is coking coal of appropriate quality. Coking coal production in India has been stagnating for the past few years. The short supply/availability of coking coal was further accentuated during last couple of years when the market price of coal touched an all-time high and good quality coking coal was in short supply in world market. SAIL is the major consumer as well as importer of coking coal in India. SAIL’s requirement of coking coal is likely to increase to 21 million tons from the present level of consumption with implementation of the growth plan.

Development of Chasnalla Colliery Project is, therefore an imperative for SAIL to augment indigenous coking coal availability.

#### 2.4 Demand-supply gap

There is a strong two-way relationship between economic development and energy consumption. The Indian coal industry was nationalized in the early 1970s. Today 55 percent of our primary energy needs and about 70 percent of power generation in India is coal based. The coal demand is projected to increase over two billion tonnes by 2030 and the share of coal in the overall energy mix is envisaged to be in the range of 52 to 62 percent. Country’s coal production is hovering around 530 million tonnes presently and we are importing about 67 million tonnes of coal both coking coal, for meeting the requirement of the steel sector and superior quality of non-coking coal for meeting the requirements of the other industries including power sector in the absence of sufficient availability from domestic sources. This shortage situation cannot be allowed to continue and domestic producers have to rise to the occasions in meeting the expectations of consumers. To supplement the efforts of national exploration agencies government is also encouraging private sector to enter into coal exploration. To meet the sharply rising coal demand we need to accelerate the deployment of appropriate technologies and practices that can enhance efficiencies of coal mining while continuing to improve mines safety and reducing the environmental impacts. Coal demand is an aggregate derivative of the overall demand of various sectors which consume Coal. The output for each sector acts as a function of the growth of National Economy. (Source: Coal Summit 2010).

#### 2.5 Imports vs. indigenous production

As per the latest estimates the imports may cross 80 million tonnes in the current year and eventually cross 200 million tonnes by 2015-16, 200 million tonnes is about 25 percent of the international trade in coal. So the Indian demand is going to
actually make a big difference in the international trade as well. Additional requirement of coal in 2011-12 is 90.35 MT. The details of coal production are given as under:-

<table>
<thead>
<tr>
<th>DETAILS OF COAL PRODUCTION</th>
<th>Domestic production</th>
<th>11th Plan 2011-12</th>
<th>12th Plan 2016-17</th>
<th>13th Plan 2021-22</th>
<th>14th Plan 2024-25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooking coal (washed coal)</td>
<td>26(13)</td>
<td>26(13)</td>
<td>35(18)</td>
<td>36(18)</td>
<td></td>
</tr>
<tr>
<td>Non-cooking coal</td>
<td>582</td>
<td>734</td>
<td>879</td>
<td>1012</td>
<td></td>
</tr>
<tr>
<td>Total production</td>
<td>621</td>
<td>778</td>
<td>942</td>
<td>1086</td>
<td></td>
</tr>
</tbody>
</table>

*Source: Coal Vision 2025 (Source: Coal Summit 2010)*

2.6 Export possibility

There will not be any export of coal from the proposed coal block. The Collieries Division, Steel Authority of India Ltd. will supply it on an exclusive basis to their steel plants.

2.7 Domestic / export markets

Chasnalla Colliery is the captive mine of SAIL & for the captive use for their steel plants. Beneficiation of coal is carried out at an existing washery combinedly for Jitpur and Chasnalla Colliery, the washery is located at Chasnalla (ML area). SAIL also plans to establish a new proposed washery with a capacity of 1.2 MTPA. There will not be any export from the mine.

2.8 Employment generation (direct and indirect) due to the project

As it is an operational mine, a total 621 number of manpower (as on 31/03/2014) is directly employed in the mine and more than that are there for indirect employment. The total requirement of managerial staff, skilled and unskilled workers for the new washery based on the equipment and facilities proposed for the project will be around 135. For the up-graded existing coal washery, the existing man power will be used and no new additional manpower is envisaged. The project will further improve the living conditions of the people. The project will generate direct as well indirect employment. The income thus generated will improve the beneficiaries’ living conditions.

3.0 PROJECT DESCRIPTION

Out of the original Lease Area of Chasnalla Mine of about 348.18 Ha, about 243.50 Ha has become part of approved Mining Plan Project Area of Tasra Opencast Project which incidentally encompasses Deep Mine, Upper Seam, part of West Quarry & the existing Washery. Now for taking Environmental Clearance for Chasnalla Colliery, an area of about 230.88 Ha has been proposed as Chasnalla Area covering Deep Mine, Upper Seam,
part of West Quarry & the existing Washery, by including part of Tasra Project Area into Chasnalla Area leaving aside Tasra Mine Pit Area intact.

The proposed mine will extract coal at the rate of @ Nominal 1.2 MTPA / Peak 1.5 MTPA from a proposed mine lease area of 230.88 Ha located at Chasnalla & Het Kandra villages in District Dhanbad, Jharkhand. The mining operations shall be carried out by Underground as well as Opencast method. The Chasnalla Colliery is located in the eastern part of the Jharia Coalfield. It is situated at about 20 km south from Dhanbad Railway Station.

A total of 25 boreholes of various depth ranges were drilled by private drilling agencies during 1959-1962. Besides these bore holes, 5 boreholes (‘Q’ series boreholes) were drilled later on by colliery authorities for finding feasibility of open pit mining along incrop region of seam XIII/XIV/XI/XII.

During 1980-81, Mineral Exploration Corporation Ltd. (MECL) have drilled 20 boreholes involving 3471.66 m of drilling at the instance of IISCO. The MECL drilling activity was mostly confined to prove upper coal horizons, primarily limited to the intersections of XVI (Bot.) seam.

In addition, geological data obtained from 3 shafts sunk in the area are also available.

The drilling in locations specified by IISCO authorities has been done by CMPDI during the period from May, 1985 to December, 1986 when CMPDI drilled 8 boreholes. Out of these, 5 boreholes (004, 005, 006, 007 & 008) have been extended upto seam VIII, 2 boreholes (001 & 002) upto seam XI/XII and one borehole (003) upto seam XV.

The “Geological Report on Deep Mine Exploration Project” prepared by CMPDIL in 1987, embodied the findings of the said exploration work with special reference to lay and disposition, quality and potentialities of XV to VIII seams.

The details of exploration by 8 bore holes drilled are given below:

During this period a total drilling of 3269.05 m (including 63.05 m of deviation drilling and 11.70 m re-drilling) was carried out in eight boreholes of depth ranging between 208 m and 577 m at specified sites given by IISCO.

A centralized Coal Washery for coal Preparation already exists in the ML area of Chasnalla Colliery. Additionally, as per further Study carried out by CET for capacity addition, it has been proposed to upgrade the capacity of existing coal washery to 2.8 MTPA and to setup a new 1.2 MTPA Coking Coal Washery at Chasnalla. Existing washery as well as proposed new washery area falls under the lease hold area of Chasnalla Colliery.

3.1 Type of project including interlinked and interdependent projects

Chasnalla Colliery is the captive mine of SAIL & for the captive use for their steel plants. Beneficiation of coal is carried out jointly at an existing washery combinedly for Jitpur and Chasnalla Colliery. SAIL also plans to establish a new proposed washery with a capacity of 1.2 MTPA. The coal produced from the mine will be entirely used for the captive purpose.
3.2 Location with coordinates

The Chasnalla Colliery is located in the eastern part of the Jharia Coalfield. It is situated at about 20 km from Dhanbad Railway Station. The Chasnalla mine concession lies between different Latitudes 23º40’03” to 23º38’33”N and Longitudes 86º26’52” to 86º27’57”E. It is covered by Survey of India Survey Sheet Nos. 88, 89, 94 & 95 (RF 1:10,000) of Topo Sheet No. 73 I/6 and falls within the sheet no. 8 of the geological map (4” = 1 mile) published by the Geological Survey of India.

3.3 Details of alternate sites & Environmental considerations

Mining being site specific, no alternatives site is under consideration. Chasnalla Colliery has been in operation prior to nationalization and operation is still continuing. Environmental considerations and protection measures assume greater importance for the project. M/s Steel Authority of India Ltd shall ensure that the proposed mine causes no adverse impact on the area. The proposed project is planned to meet all environmental norms and further improve the environs in the area.

Diversion:
There are no diversions involved as this mine has been operational for over 6 decades and has been operating in an established manner. The mine has been operating partly by OC and partly by UG.

3.4 Size or magnitude of operation

The total extent of the mining lease area is 348.18 Ha, out of which about 243.50 Ha has become part of approved Mining Plan Project Area of Tasra Opencast Project which incidentally encompasses Deep Mine, Upper Seam, part of West Quarry & the existing Washery.

Now for taking Environmental Clearance for Chasnalla Colliery, an area of about 230.88 Ha has been proposed as Chasnalla Area covering Deep Mine, Upper Seam, part of West Quarry & the existing Washery, by including part of Tasra Project Area into Chasnalla Area leaving aside Tasra Mine Pit Area intact. From the proposed lease area of 230.88 Ha, it is planned to mine a maximum of 1.5 MTPA of coal.

The life of mine presently proposed to be 10 years @ Nominal 1.2 MTPA / Peak 1.5 MTPA (May be modified as per the Mining Plan which is under preparation). Additionally, it has been proposed to upgrade the capacity of existing coal washery to 2.8 MTPA and to setup a new 1.2 MTPA Coking Coal Washery at Chasnalla. Existing washery as well as proposed new washery area falls under the lease hold area of Chasnalla Colliery.

3.5 Project description with process details


In line with the Geological Report on Deep Mine Exploration in Chasnalla Block by CMPDIL (1987), net Geological Reserves in Upper Project seams and Lower (deep mine) seams were **56.432 MT**.

There are total 15 seams in the Chasnalla Colliery and only 9 Seams available presently for working. Thickness of Coal Seams is in the range of 1.2 to 26m. Seam gradient is 38-55 deg West to East.

Reserve Status upto 3rd and 4th Horizon has been detailed as under:-

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of seam</th>
<th>Thickness (m)</th>
<th>Reserve Upto 3rd Horizon (mt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>17 SPL SEAM</td>
<td>3</td>
<td>1.50</td>
</tr>
<tr>
<td>2</td>
<td>16B SEAM</td>
<td>1.6</td>
<td>1.80</td>
</tr>
<tr>
<td>3</td>
<td>16A SEAM</td>
<td>1.4</td>
<td>2.0</td>
</tr>
<tr>
<td>4</td>
<td>16 SEAM</td>
<td>1.2</td>
<td>2.0</td>
</tr>
<tr>
<td>5</td>
<td>15 SEAM</td>
<td>9 ((6 JHAMA + MO) + 3 COAL)</td>
<td>5.684</td>
</tr>
<tr>
<td>6</td>
<td>13/14 SEAM</td>
<td>14</td>
<td>9.854</td>
</tr>
<tr>
<td>7</td>
<td>14, 13, 12 SEAM</td>
<td>26</td>
<td>10.24</td>
</tr>
<tr>
<td>8</td>
<td>10/11 SEAM</td>
<td>MP JHAMA</td>
<td>-</td>
</tr>
<tr>
<td>9</td>
<td>9 SEAM</td>
<td>6</td>
<td>5.336</td>
</tr>
<tr>
<td>10</td>
<td>8 SEAM</td>
<td>3</td>
<td>5.33</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td><strong>43.744</strong></td>
</tr>
<tr>
<td>11</td>
<td>Reserves bet. Horizon 3 and 4</td>
<td></td>
<td><strong>12.688</strong></td>
</tr>
<tr>
<td>12</td>
<td>Total Reserves in balance area</td>
<td></td>
<td><strong>56.432</strong></td>
</tr>
</tbody>
</table>

### 3.5.2 Mining method

**Background**

The Chasnalla Colliery of M/s Steel Authority of India Ltd. is situated in the South-eastern periphery of Jharia Coal field. The Colliery has been worked since long in past through a number of inclines and Quarries by earlier Mine Owners up to shallow depth. The difficult geological conditions, particularly steep inclination of the seam did not permit operation in depths. Mine was abandoned in the year 1948 and the developed workings of 13/14 seam, which were later being worked, got flooded with water in the course of operations. During late 1950s, IISCO management took over the property of Chasnalla Colliery and a proposal was concurred for extraction of the virgin part of the property after leaving an adequate barrier, against water-logged old workings which were earlier flooded with water on the rise side. Shaft sinking of the deep mine started in the year 1965 and was completed in the year 1969. Production started from Deep Mine in early 1974.
However disaster struck on 27th Dec., 1975 inundating the underground workings and resulting in the death of 375 persons. Due to tragic disaster, all mining activities of Deep Mine came to stand still thereafter.

The abrupt closure of Deep Mine forced the Management to switch over to the option of extracting combined 13/14 seam, 24 m thick and gradient of 38° by opencast Method. The seam in the Rise & upper portion was developed and partially worked earlier through manual opencast. A serious effort at mining by opencast method was made only after the disaster in 1975. Approximately 9.38 Million Tonnes of coal has already been extracted through opencast method in East Quarry till 31-03-2014. The present strike length is 1.35 km and the area is approx 0.54 SqKm the present mineable reserve of east quarry is approx 1.02 Million Tonne.

The reconstruction of Deep Mine started in the year 1990 and production started in the year 1992. The balance present geological reserve (as on 31-04-2014) of Deep mine is about 14.7 Million Tonnes. In order to make up the shortfall of production, IISCO Management contemplated the possibility of working of upper seams up-to 16 seam through Inclines.

CMPDI engaged as a consultant of IISCO, submitted the feasibility report on exploitation of the upper seams in 1979, based on the exploration carried out between 1959 & 1962. Production from Upper Seam Project started in the year 1986 and present balance geological reserve is approximately 6.88 Million Tonne (as on 31-04-2014).

In the 2003, West quarry was started by removal of old dumps and production started coming from the year 2004.

Chasnalla colliery was first started in the year 1938 as a U/G mines. Chasnalla Coal Complex basically comprised of 2 opencast projects (West Quarry & East Quarry) and 2 underground Projects (Deep Mines & Upper Seam Project) apart from a centralized Coal Washery for coal Preparation.

Factors considered for extraction

A. Range of coal thickness

The range of thickness of coal and partings is given as under:

<table>
<thead>
<tr>
<th>Seam Nomenclature</th>
<th>Range of thickness of seam (m)</th>
<th>Range of partings (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>XVII</td>
<td>4.27 – 6.16</td>
<td>42.68 – 48.17</td>
</tr>
<tr>
<td>L3</td>
<td>0.72 – 3.61</td>
<td>62.81 – 92.63</td>
</tr>
</tbody>
</table>
Options for making overall broad strategy for exploiting the block

i. East quarry:

The East Quarry which was a part of Chasnalla Colliery in the past has now been transferred to Tasra Project (Already approved in the Mining Plan and Mine Closure plan of Tasra by MOC), hence will no longer be considered in Chasnalla Mining plan and Mine Closure plan.

ii. West quarry:

The mining operations in Seam XIII/XIV have been planned and are being worked under the name of “West quarry” with shovel-dumper combination. Opencast mining method has been adopted for mining coal in XIII/XIV Seams due to following reasons:
- The coal seams are incropping at a shallow depth
- The OB : Coal ratio is favourable (5 : 1 without rehandling) for opencast mining
- The mining by opencast method will be economical against underground method
- The opencast mining operations are comparatively safer and ensure higher recovery of coal resource

Opencast mining method is selected in view of workable thickness of coal seams and favourable overburden to coal ratio (5: 1).

The overburden comprises soil cover underlain by weathered mantle which is in turn underlain by comparatively stronger OB strata. 8 m to 10 m high benches have been developed to excavate the OB. Conventional methods of mining employing shovel-dumper combination are being used. 100/150 mm dia drills are being used for blast hole drilling and the blasted OB/coal is loaded in 35 T dumpers (coal body) by 3/3.5 cum hydraulic shovels.

iii. Deep mine:

The mining operations in Seam XII, XIII and XIII/XIV have been planned and are being worked under the name of “Deep Mine”.

(a) Mine Entry:

The mine has been provided with 3 vertical shafts lined thoroughly with concrete, 5.2 M. approx. diameter, two of which have been fitted with cages and 3rd with skip of 9 T capacities.

Up cast shaft is basically a two cage shaft in use for man winding, materials, for lifting of development debris and for accommodating water, compressed air pipe ranges. Both the 2 shafts have been provided with electric winding engines capable of operating the cages or skip in balance to the two working horizons. Coal evacuation and rising is being done from the 2nd Horizon only. The skips, however, are being provided with an emergency man winding deck and is operatable from both horizons.

(b) Underground Layout:

The underground workings have been laid out in horizon system of mining with 1st horizon at approximately 172 m depth (-30m RL) from the surface, serving as return ventilation, material etc and 2nd horizon mainly for coal extraction and transport designed to be done from 292 m depth (-150m RL).

(c) Past /Present Operations:

The mining operations in Seam XII, XIII and XIII/XIV through the deep shafts were concentrated on the western side of the shafts. The seam XII was mined by
one lift of 1.8m thickness by Jankowice method in conjunction with hydraulic sand stowing. Seam XIII by 3 lifts by Jankowice method in conjunction with hydraulic sand stowing in ascending order. At each horizon, laterals have been driven both in east and west side to develop the long wall Panels. In west side, the lateral has been driven in 13 seam in coal and it has gone to the boundary having a total length of about 500 m from the place where it touches the seam and in 14 seam also the total lateral length is about 500 m.

The reserves on west side have, however, already been exhausted.

(d) Future Planning:

In future, these seams will have to be worked on the eastern side of the shafts where the thickness has become upto 24m. These seams are proposed to be mined as in the past (in west side) without changing the method of mining, system of mining and the equipment system but in 6 slices in ascending order with the help of stowing.

iv. Upper seams:

The mining operations in seams XVI, XVIA, XVIB and XVII special were planned and are being worked under the name of Upper Seams. The coal is similarly mined from seam XVI A and XVIB by Jankowice method in lifts in conjunction with hydraulic stowing.

(a) Mine Entry:

The above mentioned seams have been approached through 6 nos of inclines and 2 nos. cross-cuts.

(b) Past/Present Operations:

The method of extraction i.e. Jankowice Method as practiced in Deep Mine, has been employed for extraction in Upper Seams Project. The decoaled area is stowed with sand as practiced in ascending slicing method. The Upper Seam Project is proposed to be mined as in the past without changing the method of mining, system of mining and the equipment system.

(c) Abandoned Inclines

Earlier there were dozens of inclines which were in use in pre-take over (by IISCO) period but, presently these inclines are abandoned by sealing at the incline mouth.

3.5.3 Mineable reserves and anticipated life of mine

In line with the Geological Report on Deep Mine Exploration in Chasnalla Block by CMPDIL (1987), net Geological Reserves in Upper Project seams and Lower (deep mine) seams were 56,432 MT.

Balance approximate present geological reserve (as on 31-03-2014):
i) Lower Seams - 14.7 Million Tonnes  
ii) Upper Seams - 6.88 Million Tonnes 

Life of the mine is presently proposed to be 10 years @ Nominal 1.2 MTPA / Peak 1.5 MTPA (May be modified as per the Mining Plan which is under preparation).

3.5.4 Blasting

Blasting practice at Chasnalla Opencast Mine is in tune with the latest blasting techniques in the world. Bottom initiation is done in the holes drilled by DTH (Down the Hole) using Raydet of 475 & 500m. sec. delay timing. Surface delay timing is done by TDL (Trunk Line Delay) of 17 and 25 mli. Sec. Delay timing each hole gets separate delay timing. This Raydet DTH system is totally environment friendly. The total 3surface layout is done by Raydet tubes, which contain about 10m of high explosive/m in comparison of detonating fuse which contain10 mg/m of explosive. As a result, noise is considerably reduced. Also due to bottom initiation of holes and single hole firing by 3 consecutive delays put in deck charges, there by the ground vibration is also contained within permissible limits. As the Chasnalla Opencast Mine is surrounded by habitation, the environment friendly nature of the Raydet DTH system has been very useful for maintaining harmonious relations with the habitation. Mobile and sturdy blasting shelters have been provided for the blasters. Red flags have been provided to the explosive carrier as warning signal during blasting. In addition to two sirens on two sides of quarry, one hooter is provided on the explosive van.

Central Institute of Mining & Fuel Research, Dhanbad in 2009 has made a report on “Advice for optimization of blast design parameters at Chasnalla OCP for the safety and stability of underground water dam and subsequent monitoring of vibration generated due to blasting on the water dam for ensuring its safety and stability.” The recommendations made therein are being followed while blasting.

There are three magazines with a total capacity of 4783 kg and the Colliery has a licensed van for the transportation of explosives. Permitted carrying capacity of the vehicle is 5000 Kg.

3.5.5 Washery

SAIL is having a pit head coal washery of 2.04 Mtpa capacity in Chasnalla. However, due to deterioration in ash percentage and change in size fraction of coal, the rated capacity could not be achieved and the washery has operated at a maximum coal throughput of 1.326 Mtpa in the near past.

SAIL has proposed to upgrade the capacity of existing coal washery to 2.8 Mtpa and to setup a new 1.2 MTPA Coking Coal Washery at Chasnalla, in the leasehold area of Chasnalla Colliery. The plant is to be designed to maximize yield of clean coal having 15% to 18% ash content for use in converting to furnace coke. The secondary by-product middling will have ash content of 34% to 39% to be used in power generation units.

Annual raw coal requirement to meet the production from the Upgraded
existing washery and the proposed 1.2 Mtpa new coking coal washery is around 4.0 Mtpa. It is envisaged that around 2.1 Mtpa will be sourced from own collieries i.e., Chasnalla & Jitpur, and the balance amount of around 1.9 Mtpa will be sourced from CIL through Fuel Supply Agreement with CIL.

- **Waste disposal method**

  The new washery will be designed to produce two products namely clean coal and middling. The clean coal will have 15-18% ash with moisture content of 10% and the middling 34-39% ash. The rejects thus produced will be stockpiled separately for subsequent loading and dispatch along with middlings to captive power plants of SAIL. Hence, there will be no waste disposal from washery.

- **Quantity and type of chemicals to be used and stored**

  No chemicals are planned to be stored at site. The only requirement will be of explosives and diesel. The diesel will be systematically stored in an underground tank while the explosive will be stored in the existing magazine at Chasnalla Colliery.

- **Water required for mineral processing its source and waste disposal**

  Adequate water will be available from the mine pit for industrial use. The waste disposal will be done in slurry ponds/ lagoons from where water will be reclaimed in the closed circuit with zero discharge concept. Drinking water will be drawn from Damodar River.

3.6 Raw material required along with estimated quantity, likely source, marketing area of final product’s Mode of transport of raw material and Finished product

Raw Material Required along with estimated quantity/annum:
Explosives (T) – Approx. 750 Te, purchasing from Explosive companies
Diesel Oil (KL) – 600 KL, purchasing from Oil companies

Mode of Transportation of Raw Material:
- Explosives are being transported in Explosive Vans Approved by the Chief Controller of Explosives Nagpur.
- Diesel oil is being transported to Company Established Oil Bunks at site through approved Oil Company Lorries.

**Coal Transportation**

The coal mined from the mine is brought to the washery through belt conveyors. The washed coal is transported from the washery to the SAIL steel plants by Rail.
3.7 Resource optimization/ recycling and reuse envisaged in the project

During construction, emissions are fugitive in nature due to excavation for surface facilities, soil handling, levelling and similar activities. The content of the emissions is predominantly SPM, for which dust mask shall be provided to the workers. Water sprinkling will be done on roads, excavation sites and soil dump yards to reduce fugitive emissions. There will be some emission due to burning of fossil fuel in construction machinery.

The coal will be beneficiated at the mine site. Processing / beneficiation of the mineral “Coal” is being envisaged. The resources which are used in the mining and washery will be recycled by various methods. Sludge generated from domestic wastewater treatment will be composted and used as manure. Spent oil from transformers, machines, vehicles & DG sets generated periodically, will be sold to the authorized vendors. Mine water shall be discharged through adequate number of pumps (as required) and shall be used for mining activity.

3.8 Availability of water its source, energy / power requirement and source

3.8.1 Water

Industrial water required for HEMM washing, sprinkling on haul roads for dust suppression and for watering the mine site plantations, is supplied from pumping installation at mine sump and surface reservoir. The drinking water is supplied from Filter Plant sourcing water from Damodar River and stored in overhead tank near the facilities area and distributed through pipe lines to different facilities area for drinking and domestic purposes.

Underground mine water is being utilized for industrial uses like hydraulic sand stowing, industrial water requirement of washery, dust suppression, firefighting, road watering etc. Drinking water will continue to be sourced from Damodar River.

U/g Mines avg daily make of water – 1600 GPM

During rainy season - 2700 GPM

Washery – 6400 KLD
Domestic- 1660 KLD
Mining – 300 KLD

Sources : Domestic : Damodar River
Industrial: Mines pit

3.8.2 Power

Power is supplied to the Chasnalla Colliery through 33kV O/h line from DVC substation. Normal usage is within 7.2-7.3 MVA & peak hour usage (In monsoon season) being 8 MVA. There will be additional requirement of connected load of 7642 kW (approx.) for the new 1.2 MTPA washery plant which will also be sourced from HT Power supply system from DVC. Specific power consumption for normal operation will be less than 15 KWH/ t of raw coal throughput. Approx. 2.0 KL/D fuel (diesel) will be consumed.
3.9 **Quantity of wastes to be generated (liquid and solid) and scheme for their management / disposal**

Solid waste in the form of waste rock, associated shales etc from mining activity would be very less since it is mostly underground mining. Garbage / wastes collected from the township shall be disposed in the designated landfill areas. Sludge from Sewage and Effluent will be used for land levelling.

3.10 **Schematic representations of the feasibility drawing which give information of EIA purpose**

Schematic diagram showing the activities involved in the existing project which are potential source for Air Pollution, Water Pollution, Noise, Land degradation and impact on other environmental attributes are given under:

![Source of Pollution Diagram](image)

4.0 **SITE ANALYSIS**

4.1 **Connectivity**

**Road**

The area is well connected by rail and road. The Dhanbad-Sindri road passes through the northern part of the area. The Fertilizer Corporation of India’s (FCI) Sindri complex and Burnpur works of IISCO are at about 6 km and 82 km by road respectively.

**Rail Link**

The Sudamdih Railway Station on Bokaro-Adra Section of South Eastern Railway is immediately to the west of Chasnalla.
Air Link

The nearest airport Ranchi is situated at 161 Km south–west from Dhanbad.

4.2 Land form, Land use and land ownership

The mine lease area of the project is covered with Nallahs, roads, aerial rope ways, township, office buildings, Transmission Lines, Telephone lines, Sand stock yard, sand stowing bunkers, water reservoir, etc. The area is mostly barren, except the residential areas where some plants and vegetations are grown. Scattered patches of land, particularly in the eastern parts, are used for cultivation.

Ownership breakup of the original Lease Area of Mine is as follows:

i) Company Land (SAIL) = 225.00 Ha
   (Acquired/ Purchased/ Transferred)
ii) Govt. Land = 83.43 Ha
iii) Private Land = 39.75 Ha
iv) Forest = Nil

Total = 348.18 Ha

4.3 Topography

The area is broadly characterized by an undulating to a plain country. The colliery area has a general south-easterly slope. However, open cast mine dumps, washery wastes and present civil construction activities changed the physiographic configuration from time to time. The altitude varies from + 120m to + 170 m from MSL within the area (as per Survey of India Topo Sheets 1:10,000).

4.4 Existing land use pattern

There are no National parks, wild life sanctuary within 15 km radius. The Damodar River, which flows along the southern boundary of ML, forms the major drainage channel in this region. The course of the Domahani nalla meanders along north-eastern boundary of the colliery. Recently the natural course of the nalla has been diverted by colliery authorities and connected it with Chetu nalla flowing along eastern boundary of the area which finally joins Damodar river.

4.5 Existing infrastructure

Most of the area under reference is developed with surface constructions of Colliery Complex including the residential buildings for the colliery employees. Office buildings, open cast projects, pit-top constructions, washery complex are located in the central and southern part of the property. However, the residential quarters are
situated in the western and northern part of the property. Chasnalla and part of Kandra villages are also within the mine leased area. The area is also connected by a network of power lines. The aerial ropeway for transportation of coal from Jitpur Colliery of SAIL to Chasnalla Washery also exists in the area. The colliery is having its own Railway siding for transportation of clean coal & middlings to SAIL Steel Plants.

4.6 Soil classification

The soils of these areas have developed over granitic–gneiss, occurring on upland, gently sloping with undulating surrounding country land. These soils are fine loamy to fine textured and red to yellowish red to greyish in colour. These soils have moderate erosion. The soils are characterised by moderately acidic to neutral in nature, low organic carbon status, deficient in nitrogen and phosphorous, medium potassium content with medium available water holding capacity.

4.7 Climatic data from secondary sources

(i) Climate

Dhanbad district experiences sub-tropical climate, which is characterized by hot summer from March to May and well distributed rainfall during southwest monsoon from June to September. The south-west monsoons bring about 80 to 85% of annual rainfall. Winter season in the area is marked by dry and cold weather with intermittent showers during the month of December to February. The post monsoon season comprises of October and November while December transitions into winter. The fall in temperature is upto 5 deg C. Clear bright sky with occasional rain during January and February are observed in this season. The summer season prevails from March to June with gradual increase in temperature and moisture. The temperature rises as high as 48 degree centigrade. Afternoon thunder storm is frequently observed causing poor visibility in May. From later half of the month of June the rainy season starts and it ends in September. The south-west monsoon brings about the major precipitation.

(ii) Long term meteorology

Long term meteorological data of Dhanbad has been taken from the “Climatological Normals” (1961-1990) issued by IMD Pune.

The data in respect of various parameters are discussed briefly in the following paragraphs.

i. Temperature

As per the monthly average of daily maximum and minimum temperatures for the period 1961 to 1990 at IMD Station for Dhanbad, the monthly mean of minimum
temperatures ranges from 6.7°C in January to 21.3°C in July. The monthly mean of maximum temperature ranges from 28.9°C in December to 43.4°C in May.

ii. Rainfall

The average annual rainfall for the year 1961 to 1990 was 1484.6 mm. The monsoon season is spread over the months from June to September.

iii. Humidity

As per the relative humidity data for 8:30 hrs and 17:30 hrs taken for IMD, Dhanbad from the “Climatological Normals” (1961-1990), it is seen that relative humidity is higher during the period of monsoon and lower during other months. The average relative humidity is 69% in the morning and 56% in the evening.

iv. Wind flow pattern

The wind data from 1961-1990 has been analyzed. From perusal of the morning data, it is follows that the predominant wind directions are generally north-west in January to March and November & December. The predominant wind directions are generally south-east in April to October. Mostly, the wind speed varies from 1 to 19 kmph and significant amount of calm.

4.8 Social infrastructure available

Hospitals, school, community facilities are present in the villages in the core zone as well as in buffer zone within 10 Km of study area.

5.0 PLANNING BRIEF

5.1 Planning Concept

Chasnalla Colliery of Collieries Division, M/s Steel Authority of India Ltd is has been in operation prior to nationalization and operation is still continuing for supplying coal for captive use of its steel plants. The company takes care of production, management and mining operations. The occurrence of economically mineable coal seam has been well known in the Jharia coal field over the country.

5.2 Population projection

Large number of local personnel including land losers has been mostly recruited in unskilled, semi skilled office assistant categories etc. The employment of local people in primary and secondary sectors of project has upgraded the prosperity of the region.

The following socio-economic benefits have been ushered in the area by the mining activity.

- Conservation of precious coking coal
- Direct and indirect employment opportunities.
- Improvement in the trade and commerce as a result of the improved cash flows.
- Further improvement of infrastructure facilities.
- Improvement in the greenery due to plantation programmes by the mine authorities.
- Drinking water supply improvement.
- The occupational pattern of the people has changed for the better and support services created and will create further employment and growth opportunities.

5.3 Land use planning (break up along with green belt etc.)

As this project is mainly an underground project hence virtually no land degradation will take place (excluding meager degradation which may take place due to West Quarry). Though future degradation by OC excavation may be meager but rehandling of surface dumps and backfilling of the excavated area (West Quarry) in the past will have to be done and area reclaimed.

5.4 Assessment of infrastructure demand (physical & social)

Complete facilities near the site are very important for coal production. It is imperative to develop core infrastructure like power, road, telecommunication, housing, service buildings viz. office, store, first aid centre, canteen, etc. for a large number of employees for the project. The mine project is at 20 Km south of Dhanbad Railway Station. The site services required already exist at the mine within the premises of mine complex as it is already an operational mine. The area is well connected by rail and road. The Dhanbad-Sindri road passes through the northern part of the area.

5.5 Amenities / facilities

Hospitals, school, community facilities are present in the villages in buffer zone within 10 Km of study area. The Mines Office, Workshop, Garage & other ancillaries already exists. The First Aid Room, Rest Shelters, Toilets, Tool /Store Rooms etc have been provided at mine site.

6.0 PROPOSED INFRASTRUCTURE

6.1 Industrial area (processing area)

As the mine is already operational, the infrastructure like workshop complex, coal handling plant, haulage room, store, workshop, fan house, substation etc. already exists. The existing office buildings, workshops and CHP facilities are adequate for producing and dispatching the enhanced production of the project under proposal. The existing washery plant with equipments will be retained and the plant capacity will be up-graded through two stages. In the initial stage no new addition is envisaged. However, in the second stage, the adjoining area of the washery will be utilised for installation of one additional module.
Only addition will be related infrastructure required for a new 1.2 MTPA Coking Coal Washery to be set up in an approximate area of 4.0 Ha in the lease hold area of Chasnalla.

6.2 Residential area (non processing area)

No additional township is required for the envisaged proposal. The existing township is sufficient to cater the needs of persons employed in this Project.

6.3 Green belt

Green belt has been developed around CHP, mine-colony interface etc., to dampen the noise. Further green belt along the periphery of the facility area shall be developed keeping in view the environmental problems.

6.4 Social infrastructure

As the mine is already operational, social infrastructure for the villages in & around the mine like permanent roads, bore wells, drinking water facilities, power line, telephone line etc already exists. Social Infrastructure available in the area will cater the needs of the employees working in the mine. No additional social infrastructure is proposed in the project.

6.5 Connectivity

Connectivity is already covered in para 4.1.

6.6 Drinking Water management (source & supply of water)

The drinking water is supplied from Filter Plant sourcing water from Damodar River and stored in overhead tank near the facilities area and distributed through pipe lines to different facilities area for drinking and domestic purposes.

Drinking water will continue to be sourced from Damodar River.

Water requirement: Domestic: 1660 KLD

Source: Damodar River

6.7 Sewerage system & industrial waste management

The chances of the water quality getting affected due to mining activity are very remote, as no chemical having toxic element is used in carrying out mining activity. Mining is carried out by underground as well as opencast method. Garland drain is constructed all around the dump to arrest any inrush of water from nearby. Also, neither soil nor coal contains toxic elements, which can affect the quality of the water. Sewage from colony is treated in septic tank and soak pits system. Run-off water from mine facilities area as well as pumped out mine water is led to settling ponds.
6.8 **Solid waste management**

**Mine**

Solid waste in the form of waste rock, associated shales etc from mining activity would be very less since it is mostly underground mining.

**Washery**

It’s a two products washery (Existing as well as new one) viz. clean coal for supply to steel plants & middlings to captive thermal power stations, with no rejects. Tailing generated from the proposed washery is treated in a tailing dewatering system and is mixed with middling or reject.

Some discards are there, which are disposed in the mines. The coal washery is maintaining the close water circuit operation with zero effluent discharge.

6.9 **Power requirement & supply / source**

Already covered in para 3.8.2.

7.0 **REHABILITATION AND RESETTLEMENT PLAN**

As it is an existing mine, most of the area under reference is developed with surface constructions of colliery complex and no R&R is involved. The land required for location of new washery plant and development of related infrastructure is almost owned by the proponent and a small part only needs to be acquired from local families.

8.0 **PROJECT SCHEDULE & COST ESTIMATES**

8.1 **Project schedule**

The project under the proposal is an operating mine and it is proposed to enhance its peak capacity to 1.50 MTPA. Life of the mine is presently proposed to be 10 years @ Nominal 1.2 MTPA / Peak 1.5 MTPA (May be modified as per the Mining Plan which is under preparation).

Additionally, it has been proposed to upgrade the capacity of existing coal washery to 2.8 MTPA and to setup a new 1.2 MTPA Coking Coal Washery at Chasnalla. The expansion of the colliery & washery capacity is scheduled to be started after receipt of environmental clearance.

8.2 **Cost Estimate**

The indicative total capital cost estimate for enhancement of colliery capacity to @ Nominal 1.2 MTPA / Peak 1.5 MTPA is estimated at 150 crore & the up-gradation of existing washery to 2.8 Mtpa and setting up of 1.2 Mtpa coking coal washery is estimated at Rs. 300 crore.
9.0 ANALYSIS OF PROPOSAL (FINAL RECOMMENDATIONS)

This is an underground as well as opencast mine of proposed capacity of @ Nominal 1.2 MTPA / Peak 1.5 MTPA, and the proposed extent of mine is 230.88 Ha. Expansion of existing washery to 2.8 MTPA and setting up of New washery of 1.2 MTPA capacity has also been proposed in the lease hold area.

Since it is mainly underground mining, as opencast mine is a very small, therefore the environmental impacts will be minimum.

The following physical infrastructure facilities will further be improved due to capacity expansion of the existing Project.

- Road Transport facilities
- Communications
- Housing facilities
- Water supply and sanitation
- Power
- Medical, Educational and social benefits will be made available to the nearby civilian population in addition to the workmen employed in the project.

**Improvement in Social Infrastructure**

Coal mining and agriculture is the basic sector of employment for the local people in this area. This project facilitates indirect employment opportunity. Employment is expected in trade and other ancillary services. Employment in these sectors is primarily temporary or contractual and involvement of unskilled labour is more. A major part of this labour force is mainly from local villagers who are expected to engage themselves both in agriculture and project activities. This will enhance their income and lead to overall economic growth of the area.

The following changes in socio-economic status are expected to take place with this project.

i) The project is having a strong positive employment and income effect, both direct as well as indirect.

ii) The project is going to have positive impact on consumption behavior by way of raising average consumption and income through multiplier effect.

iii) People perceive that the coal mining projects help in the development of social infrastructures / such as.

- Education facilities
- Banking facilities
- Post offices and Communication facilities
- Medical facilities
- Recreation facilities
- Business establishments & Community facilities
- Plantation and parks

**Other Tangible Benefits**

The Expansion project is likely to have other tangible benefits as given below:

- Indirect employment opportunities to local people in contractual works like housing construction, transportation, sanitation, for supply of goods and services to the project and other community services.
- Additional housing demand for rental accommodation will increase.
- Market and business establishment facilities will also increase.
- Cultural, recreation and aesthetic facilities will also improve.
- Improvement in communication, transport, education, community development and medical facilities.
- Overall change in employment and income opportunity.
- The State Government will also benefit directly from the proposed project, through increased revenue from royalties, excise duty and etc.

**Justification**
- The development of coalfield will provide better social and economic life to the area. It will also give a boost to the industrial activity in the area and help in creating national wealth.
- In order to meet the ever increasing coal demand, it is essential to at least maintain the approved rated production.