
Chapter- 5

ANALYSIS OF ALTERNATIVES

5.1 INTRODUCTION

Mining works are site-specific project. Minerals lies beneath the earth surface at the fixed area and extraction of that mineral needs excavation in the area. So, there are a little choice left for the alternative sites. Final site selection is depend on the suitability, quantity and quality of mineral. Coal is the back bone for power industries in our country. Almost 80% power is generated through the thermal power stations. This situation will remain for at least another 50 years.

Liberalization of power sector by Govt. of India has generated wide spread interests for private and public sector investments in power generation. As such, there is an appreciable increase in the number of upcoming new thermal power projects in both private and public sectors. This has resulted in a sharp increase in the demand of power grade coal in the country. So, under the emergency of coal production program NEC has to revised its Area wise production output target. Opening of this project (0.25 MTY) is therefore, proposed with a view to fulfill the above indicated growth in demand. It is proposed to exploit the coal reserves in the proposed project by opencast method. The conventional shovel-dumper system of mining is proposed to be followed for O.B removal and coal extraction.

It is proposed to open up the Lekhapani open cast mine from the south-western end in the incrop of 60' seam by constructing an Initial Mining Cut (IMC). Minimum depth at the mine entrance is 15 m. The access trench will be driven along the incrop and the mine floor will be maintained at 420 m floor contour. The mining operations will then proceed towards north as well as in the eastern direction. Later on the mining operations will be in strike direction only.

5.2 JUSTIFICATION FOR SELECTION OF SITE & MINING TECHNOLOGY

Considering the geo-mining conditions, no alternative site is envisaged. Following are the reasons behind selecting this project-

1. The cost of production per tonne of coal in NEC from underground mines is very high and suffers a loss of Rs. 7000-8000 per tonne of coal from underground mines. Whereas, coal from opencast mines contributes a profit of nearly Rs. 1000 per tonne. As a result, NEC has decided to close some of its underground mines and more stress on coal production from opencast mines for its revival.
2. Its geological formation supports an opencast project because the deposit is shallow.
3. This is in close vicinity of other existing projects.
4. It consists of good coking coal but having high sulphur content (1.5-3.5%).
5. Its economics are favorable for opening of a mine.
6. All-important infrastructures exist.
7. It will partly fulfill the target of the area/company.
8. No important structures or places are present in the either core zone and close vicinity.
9. The proposed area constitutes a hilly terrain with elevations ranging from lower heights in the southern part of the western half of the block (with reference to colliery bench mark) to 675.24 m in the south eastern part. However, the elevation above mean sea level ranges from 280.00m to 520.00m in the eastern part of the block. In general the ground slope is towards north but it is towards north & south both in central and western parts of the block.

Alluvium, clayey and sandy soil forms the upper most horizon in the entire area. Thickness of these sands varies 5.00m to 23.00m. However, the most common variation is found between 9.00 to 12.00 metres.

Sandy clay and weathered sandstone generally occur below the alluvium cover in the area. The thickness of this zone generally varies from 2.72 m to 6.43 m. However, the most common variation is found between 3.00 m to 6.00 m.

The main overburden comprises various types of sandstone and shale. Various coal seams and discontinuous bands of carbonaceous shale are also found in the whole area. Grey sandy mudstone and mudstone are also found at places. The coal is soft and friable.

Parting between the coal seams are in general carbonaceous shale and grey shale. The band within the coal seams also consists of such carbonaceous shale and grey shale.

The detailed exploration and investigation carried out by CMPDI have established the presence of five (5) coal horizons over an area of 1.00 Sq. Km. Seam I (60') and seam III (20') are the two important coal seams. In other three seams, seam IV (5') has some mining potential and has been considered for estimating the mineable reserves. Seam II (7') and seam V (8') coal horizons are very inconsistent and occur over very small area and hence have not been considered for opencast mining. Mine boundary option-I is based on the commercial consideration of mining maximum possible reserves. Mine boundary along the pit floor in dip side is based on the boundary fault having a throw of 200m. Coal seams are highly dipping varying from 20° to 50° . There is no report of any underground working in the mining area. The area experiences very high rainfall during rainy season, during which the opencast mining operations have to be stopped.

0.25 Mt. of coal will be produced per annum from the three coal seams and quantity of OBR is 3.55 Mcum per annum (Peak OBR) from numerous benches boundary. Limited strike length of benches and narrow working space have been considered in the proposed mining system. Technology options are guided by these factors mainly.

Limited extent of the deposit, variable thickness of coal and floor structure makes shovel-dumper combination more suitable under the prevailing geo-mining conditions. Shovel-dumper application has been considered for coal, inter-burden and lower horizons of OB which largely comprise of sandstone and shale.

3.7-4.0 cum diesel hydraulic shovels along with 35T Rear Dumper (RD) and 2.7-2.8 cum diesel backhoes along with 35T RD have been considered for OB removal and Coal production.

The proposed number of digging equipment will also facilitate smoother transition of mining operations from one bench to another under the prevailing geo-mining conditions.