

1.0 RISK ASSESSMENT

Risk assessment for Suliyari Coal Mine has been carried out and based on the same, disaster management plan has been prepared. During the operation of the proposed opencast mine, following risks have been identified:

- Working with Surface Miner
- Failure of Slope in the open pit
- Failure of Slope of External/Internal dump
- Fly rock fragments from Blasting operations in opencast mine
- Surface fire (Electrical and Oil).
- Possible danger due to storage of explosives
- Opencast inundation
- Hitting of Persons by Trucks, Collision of Trucks

1.1 Working with Surface Miner

While working with surface miner on coal bench the following risks are associated:-

1. Toppling of surface miner while cutting along the edge of the coal bench

Precautions

- Minimum 1m width of coal shall be left along the edge of coal bench.
- While cutting along the edge of the fault plane minimum 3m coal shall be left.
- Cutting along the edge of the coal bench shall be done under the direct supervision of supervisor.
- Operator to be vigilant.
- Sensor Operator shall guide the Operator who is in the cabin of the Surface Miner.
- Operator shall not lift the drum from cutting mode unless the machine is marched to safe place.
- Pre-warning signal before SM is started.
- Interlocking of water spraying and drum cutting to be incorporated.

2. Marching of Surface Miner On Gradients

Precautions

- Milling drum shall be kept at maximum height.
- Sensor operator shall ensure the clearance between drum and ground.
- Sensor operator shall maintain 10 m distance from the machine while travelling.
- Shall be marched in direction of either true dip or strike of the Seam.

3. Loading along the Edge of the Coal Bench

Precautions

- Loading shall be done keeping the loader perpendicular to coal Bench edge.

1.2 Failure of slope in the pit

In order to allay dangers due to opencast slope failure, slope stability estimations shall be made for the quarries after determining various physical parameters of the ground mass like uni-axial compressive strength, tri-axial compressive strength, cohesion, angle of friction, specific gravity of the rock, water pressure etc. Besides, all the discontinuities shall be plotted in stereo plots, to check that there is no chance of any planer failure, or wedge failure. Besides determining factor of safety the slopes shall be monitored at regular intervals to check for any possible failure. The well-developed drainage system over the lease area shall ensure that storm water does not accumulate in the lease area and therefore hydrostatic pressure remains at a low level.

The mine working parameters shall be designed based on the above considerations with sufficient safety margins to eliminate any chances of slope failure in the pit.

1.3 Failure of slope of external dump

The external dumps have been designed at an overall slope angle of around 27° with a bank slope angle of 37°. As far as possible natural depressions have been filled upto the adjacent ground level and then subsequent terracing with maximum height of individual lift of 20m has been proposed in such a way that total height of the dumps above natural ground profile is not more than 90m.

As the dumps attain final position, the slopes will be terraced and proper vegetation will be laid which will cause binding of the soil preventing any slope failure. Retaining walls will be built all-around the external dumps which will have weep holes for passage of storm water to join garland drains.

1.4 Fly rock fragments and vibrations due to blasting

Trial blasting results of the proposed coal mine shall be used to arrive at the field empirical equations based on which the charge per delay shall be regulated to protect the nearby structures. All precautions related to control of fly rock will be taken during the blasting operations (described in chapter 4 of EIA report). Safety zone of 300m as per statutes shall be maintained. The nearest habitation is too far to be affected by fly rock.

1.5 Surface Fire

Spillage of HSD and resultant fire constitutes a potential risk. The quantity of the maximum oil, which can spill, is not much and can be easily controlled. Sufficient nos. of portable fire extinguishers shall be provided at strategic locations to take care of any eventuality.

There are risks of fire at the electrical substation and transformers. Dry and foam type portable fire extinguishers shall be made available at the electrical substation and control room. In case of any electrical fire, the personnel on duty shall shut down the electrical fire and inform the shift-in-charge. Personnel trained in dealing with electrical fires will be summoned. The fire area will be cordoned off till the fire is fully extinguished and remain so until all wreckage and debris is cleared away. After

effecting necessary repairs the power will be restored. The clearance for restoration of power shall be given only by the shift-in-charge.

As soon as any fire is reported the shift-in-charge shall assume the function of disaster controller. In case of serious fire and depending on the gravity of the situation, the Mines Manager may be summoned to assume charge. Personnel trained in dealing with fires will be summoned. Meanwhile the hospital will be informed to handle casualties. The fire area will be cordoned off till the fire is fully extinguished and remain so until all wreckage and debris is cleared away.

1.6 Possible danger due to storage of explosives

Adequate safety zone shall be provided as per statutory requirements while locating the magazine. The magazine shall be constructed as per plan approved by Dept. of Explosives and Director General of Mines safety (DGMS). The following have been considered in the design of the magazines.

- All dry vegetation within a 15 m radius will be cleared.
- Lightning arrestor will be installed on the magazine roof.
- A safety zone around the magazine will be created.
- In summer, the temperature inside the magazine will be monitored to guard against spontaneous fire.
- The manufacturing dates of all explosives stored in the magazine will be carefully recorded so that no explosive whose shelf life has expired is kept in stock.

In case of any fire, whosoever notices the fire will sound the alarm and inform the shift-in-charge. The shift-in-charge will inform security personnel and arrange to evacuate all personnel, except those who are required for firefighting, from the area. The fire brigade shall be summoned to deal with the emergency. Concerned district officials will be informed. Nearby hospitals will be informed to standby to handle casualties.

1.7 Opencast Inundation

Following precautionary measures shall be undertaken:

- A careful assessment of the danger of inundation from surface water shall be made before onset of monsoon season every year and adequate precautions against such dangers shall be implemented.
- Effectiveness of precautions, obstructions in normal drainage system etc. shall be checked regularly. During rainy season, blockage of nala / stream may occur, which needs to be cleared.
- Every entrance into the mine shall be at least 3.5 m above the High Flood Level (HFL) at that point.
- Fixation of danger mark of water level and effectiveness of communication shall be taken care.

- The mine shall have adequate pumping capacity and standby pumping arrangements shall be made ready.

1.8 Hitting of Persons by Trucks, Collision of Trucks

To avoid hitting of persons and collision of trucks on haul roads the following steps shall be taken:

- One way traffic shall be maintained all along the haul roads
- Traffic signal/ Caution boards shall be displayed at appropriate places to avoid accidents
- Side Berms and divider of sufficient size shall be provided all along the haul road, so that the vehicles can't go out of the road
- Traffic rules shall be implemented.
- Persons shall be transported to work place in conveyance vehicle.
- Speed locking shall be provided to trucks at 30 kmph.