

## **7.1 RISK ANALYSIS AND DISASTER MANAGEMENT PLAN**

### **7.1.1 Risk Analysis**

Risk analysis is the systematic study of uncertainties and risks encountered in various areas. Risk analysis seek to identify the risks involved in mining operations, to understand how and when they arise, and estimate the impact (financial or otherwise) of adverse outcomes. It also defines and analyzes the dangers to individuals, businesses and government agencies posed by potential natural and human-caused adverse events.

Preliminary Risk assessment is based on the philosophy that “Prevention is better than cure”. Mining operations may be carried to the utmost safety but there is always some element of danger or risk in it. No major disaster is envisaged. Only minor accidents may take place. The applied area is hilly. No perennial source of surface water is present in the ML area. No drilling or blasting is proposed. The mining operations will be carried out under supervision of statutory personnel’s as per provisions of Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016, MCDR 1988, Mines Rules 1955, Mines Act 1952 & strictly following safety aspects as per MMR 1961 monitored by Directorate General of Mines safety.

The lease area does not come under active seismic zone. Land slide, subsidence is not expected in view of opencast mining. In case of eventuality, first aid will be given by the competent authority initially to the injured person. The competent person/Mines manager or mining engineer will give notice of accident as per Rule-23 of Mines Act-1952. The persons/competent authorities named above will be responsible for co-ordinations between management district authorities / DGMS etc. Regarding general safety as per Rule-181 of MMR 1961, “No person shall negligently or will fully do anything likely to endanger life or limb in the mine, or negligibly or will fully omit to do anything necessary for the safety of the mine or of the persons employed there in”. The workers will be provided with protective foot wear and safety helmets.

### **7.2 Sources of Accidents/Disaster**

Mining will be done by Open Cast OTFM method to produce Bauxite, Ochre & White Earth on the hilly terrain. There are various factors, which can create unsafe working conditions/ hazards in mining of minerals. The following types of hazards are identified during the proposed mining operations:-

- (1) Mining Machinery and Loading operation.
- (2) Vehicular movement and Transportation of Ore
- (3) Collapse of benches

- (4) Fall of workers from high benches

### **7.3 MITIGATION MEASURES**

#### **7.3.1 Mining Machinery and Loading operation:-**

The mechanical failure and human error may lead to accidents due to mining machinery and loading such as dumpers and loader cum excavator.

The following activities will be done to minimize the risk are:-

- ✓ At the time of loading no person will be there within the swing radius of the excavator.
- ✓ The dumpers/ trucks will stand near the loading equipment and fully braked when the muck is filled in it.
- ✓ The truck would be brought to a lower level so that the loading operation suits to the ergonomic condition of the workers.
- ✓ The workers will be provided with helmets, gloves and safety boots.
- ✓ Operations during daylight only.
- ✓ All the mining machineries will be regularly maintained and checked such as brakes, lights and horns to keep in the efficient working order.

#### **7.3.2 Measures to prevent accidents during vehicular movement & transportation**

The following activities will be done to minimize the risk are:-

- ✓ The truck will be covered with tarpaulin and maintained to prevent any spillage.
- ✓ To avoid danger while reversing the trackless vehicles especially at the embankment and tipping points, all areas for reversing of lorries should be made man free as far as possible.
- ✓ The vehicles must be maintained in good repairs and checked thoroughly at least

once in a week.

- ✓ All transportation within the main working will be carried out directly under the supervision and control of the management.
- ✓ Overloading should not be permitted and the maximum permissible speed limit should be ensured.

- ✓ The truck drivers should have proper driving license.
- ✓ A statutory provision of the fences, constant education, training etc. will go a long way in reducing the incidents of such accidents.

### **7.3.3 Measures to prevent accidents from collapse of bench.**

The following activities will be done to minimize the risk are:-

- ✓ Opencast working will be done following benches as per Regulation 106 of MMR 1961.
- ✓ Ultimate slope angle = 45°.
- ✓ Bench height should not be more than the digging height of the shovel. The width of the bench should not be less than the height.
- ✓ The loose rock adhering to high wall should be dressed under the guidance of competent person.
- ✓ Retaining parapet wall on bench edge to prevent fall of man and machinery.

### **7.3.4 Measures to prevent fall of workers from high benches**

The following activities will be done to minimize the risk are:-

- ✓ Every entrance from a roadway in the mine temporarily discontinued will be provided with a fence, barrier or gate to prevent any unauthorised entry.
- ✓ The top of every opencast working shall be kept securely fenced.
- ✓ The quarry faces will be suitably benched as per Regulation 106 of MMR 1961.

## **7.4 DISASTER MANAGEMENT PLAN**

This includes high risk accidents like Earthquakes, fire, seismic activities etc. and emergency plan proposed for quick evacuation, ameliorative measures to be taken etc. The lessee will coordinate to meet such eventualities along with the assistance from the local authorities.

- ✓ The shallow depth of activities will not involve any high risk accident due to side falls/collapse.

- ✓ The complete mining operation will be carried out under the Management and control of experienced and qualified Mines Manager having Certificate of Competency to manage the mines granted by DGMS.
- ✓ All the provisions of Mines Act 1952, MMR 1961 and Mines Rules 1955 and other laws applicable to mine will strictly be complied with.
- ✓ During heavy rainfall the mining activities will be closed.
- ✓ All persons in supervisory capacity will be provided with proper communication facilities.
- ✓ Disaster Warning System” as developed will be strictly implemented.

The disaster management plan is aimed to ensure safety of human life and property and protection of environment Following are the objective of the disaster management plan. (i) First Aid to injured.

- (ii) Rescue operation and provision of adequate medical facilities to the injured.
- (iii) Safety of the human life in the buffer zone if needed.
- (iv) Protecting and minimizing damage to property and the environment.
- (v) Initially restrict and ultimately bring the incident under control.
- (vi) Identify any dead.
- (vii) Inform to the administration, DGMS and statutory persons as per Rules.
- (viii) Setting up an Emergency response organization under mines manager with assigned duties and responsibilities for incident response and emergency response.
- (ix) Setting up a permanent organization for completion of emergency and restoration of normalcy by complying with health, safety, and environmental laws and regulations.