RISK ASSESSMENT

RISK ANALYSIS

Risk analysis is the systematic study of uncertainties and risks encountered in various areas in the proposed project. Risk analysis identifies the risks involved in mining operations and related activities. In this Chapter of EIA report, the types of risk involved, risk potential and impact on environment, lives and property will be discussed. The potential of impacts in the proposed project is to understand how and when it arises, and estimates the impact (financial or otherwise) of adverse outcomes. It also defines and analyzes the dangers to individuals, businesses and Government posed by potential natural and human-caused adverse events.

RISK AND HAZARDS IN RIVER BED MATERIALMINING

River bed material mining is done by open cast semi-mechanized method. Mining is done only within the Ujh River Bed stretch located near revenue village Maichak of Tehsil Sumwan, District-Kathua, Jammu & Kashmir. The lease area is 49.68 ha. There is no land degradation due to mining activities as mining is done only on river bed surface. There will be no over burden (OB) or waste generation as the river bed material is exposed in the river bed. There will be neither any stacking of soil nor creation of OB dumps. The solid waste management in the River Bed Mining project is ruled out.

However, there are various factors, which can create unsafe working conditions/ hazards in mining of river bed material (minor minerals) from river bed. The following types of hazards are identified during the river bed mining operations:-

- Accident during river bed material /mineral loading, transportation and dumping
- Accident due to vehicular movement
- Inundation/ Flooding
- Quick Sand Condition

Mitigation measures

Measures to prevent accidents during loading

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 gloves and safety shoes during loading.

- Opening of the side covers (pattas) should be done carefully and with warning to prevent injury to the loaders.
- Mining activities in daylight only.

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 conditions and checked thoroughly at leastonce 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

Measures to prevent incidents during Inundation/ Flooding

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

- During monsoon months and heavy rains the mining operations are ceased.
- There should be mechanism/ warning system of heavy rains and discharges from the
- Up-stream of water.
- Inundation of flooding is expected and beneficial for these mines as during this time only the mineral reserve gets replenished

Precautionary Measure for Sudden Release of Water from Upstream Dam

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

- The mining should be done only during the dry season and under strict supervision.
- Mining activities should be avoided during monsoon season.
- No go zones should be clearly marked and made aware to the mine workers.
- Deep water areas must be identified.
- Measures to prevent sudden increase in water level

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

- The mining activities will be restricted to 3m depth from river bed surface.

- Mining activities will be avoided during monsoon season.
- Mining will be done as per the approved Mining Plan and it will be ensured toavoid the pounding effect.

DISASTER MANAGEMENT PLAN

This should deal with action plan for high risk accidents like Landslides, Earthquakes, subsidence, Avalanches & Snow Blizzards, Drought, Wind Strom, Cloudburst, flood, inundation, fire, seismic activities, tailing dam failures etc. and emergency plan proposed for quick evacuation, ameliorative measures to be taken etc. The capability of lessee to meet such eventualities and the assistance to be required from the local authorities should be described.

The shallow depth of activities in river bed mining 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.
- Proper coordination with Irrigation Department will be maintained so that at the time of releasing water, if any, from the dam suitable warning/information is given in advance.
- Disaster Warning System" as developed will be strictly implemented.

Occupational health hazards

Dry- pit mining by open cast method involves dust generation by excavation, loading and transportation of mineral. At site, during excavation and loading activity, dust is main pollutant which affects the health of workers in mining activities whereas environmental and climatic conditions also generate the health problems.

Addressing the occupational health hazard means gaining an understanding of the source (its location and magnitude or concentration), identifying an exposure pathway (e.g. a means to get it in contact with someone), and determination of likely a receptor (someone receiving the stuff that is migrating).

Occupational hazard due to river bed mining mainly comes under the physical hazards.Possible physical hazards are as below mention:-

Physical hazards due to mining operations

Following health related hazards were indentified due to riverbed river bed mining operationsto the workers:-

Light: - The workers may be exposed to the risk of poor illumination or excessive brightness. The effects are eye strain, headache, eye pain and lachrymation, congestion around the cornea and eye fatigue.

Heat and Humidity: - The most common physical hazard is heat. The direct effects of heat exposure are burns, heat exhaustion, heat stroke and heat cramps; the indirect effects are decreased efficiency, increased fatigue and enhanced accident rates. Heat and humidity are encountered in hot and humid condition when temperatures and air temperatures increase in summer time up to 40^{o} C or above in the river bed mining area.

Eye Irritation: - During the high windy days in summer the sand could be the problems for eyes like itching and watering of eyes.

Respiratory Problems: - Large amounts of dust in air can be a health hazard, exacerbating respiratory disorders such as asthma and irritating the lungs and bronchial passages.

Noise Induced Hearing Loss: - Machinery is the main source of noise pollution at the mine site.

Management of health hazards

Management of Health Hazards

Particulars	**Control Measures**
Heat & Light	• The mine site will have adequate drinking water supply so that workers do not get dehydration. • Lightweight and loose fitting clothes having light colors will be preferred to wear. • Rigorous exercise and more physical activities will be avoided in hot weather.
Noise	• Noise exposure measurements will be taken to determine the need for noise control strategies. • The personal protective equipment will be provided for each mine workers. • Supervisor will be instructed for reporting any problems with hearing protectors or noise control equipment. • At noisy working activity, exposure time will be minimized. • Machineries will be labeled with noise levels.
Respiratory	• PPE like face mask etc. will be provided during mining activity. • Periodic medical examinations will be provided for all workers. • Awareness program will be organized for workers.