RISK ANALYSIS & DISASTER MANAGEMENT PLAN

The possible risks in the case of River sand mining projects are erosion, inundation/floods, accidents due to vehicular movement, Drowning, accident during sand loading and transporting etc. Mining and allied activities are associated with several potential hazards to both the employees and the public at large. A worker in a mine should be able to work under conditions, which are adequately safe and healthy. At the same time the environmental conditions should be such as not to impair his working efficiency. This is possible only when there is adequate safety in mines. Hence, mine safety is one of the most essential aspects of any working mine. Safety of the mine and the employees is taken care of by the mining rules & regulations, which are well defined with laid down procedure for safety, which when scrupulously followed safety is ensured not only to manpower but also to machines & working environment.

DEFINE ENVIRONMENTAL RISKS

To understand the environmental risk assessment it is important to familiar both the terms i.e. Risk and Hazard. The definitions of environmental risk are as follows:

(a) **Risk:** Risk is an actual or potential threat of adverse effects on environment arising out of an organization activity.

(b) **Hazard:** Hazard is the potential to cause harm. An environmental hazard is a generic term for any situation or state of events which poses threat to the surrounding environment.

Objective of Risk Assessment

- Identifying hazardous activities
- Assessment of risk level and severity in different operations
- Identification of control measures
- Setting monitoring process
- Reduce the impact of mishaps of all kinds
- Reduce the inherent potential for major accidents.

Methodology of Risk Assessment

Risk assessment is mainly based on the environmental impact of various parameters,
which have been described in Chapter-V. The methodology of risk assessment will involve following steps as:

![Methodology of Risk Assessment Diagram](image)

Fig. 7.1 Methodology of Risk Assessment

**Assessment of Risks & Mitigative Measures**

Factors of risk involved due to human induced activities in connection with mining operations are as under:

A. **Possible Risks Due to Inundation/Floods & Its Control**

Mining will be done during the non monsoon periods; therefore problem of inundation/floods is not likely to happen. There was no incidence of inundation/floods reported from the area so far. River flows only in monsoon season.

B. **Dewatering**

Depth of mine is limited to 3m depth only from the surface of river channel whereas the ground water flows at 5m to 6m below surface channel. Hence no dewatering is required. During mining, no ground water table will be intersected at all.

C. **Drowning, if Any**

There is no possibility of drowning in the river, mining operation carried out in dry bed only. All mining activities will be stopped during the monsoon season. The mining operation will do under strict supervision and only during dry season. Deep water zones
in the river will be identified. No go zone will be clearly marked and shall be aware to the mine workers.

D. Possible Risks Due to Failure of Pit Slope & Its Control

Pit will be created of limited depth only i.e. 3m thus the chance of failure of pit slope is marginal.

E. Accident due to Vehicular Movement and their Mitigation Measures

- Possibilities of road accidents are possible due to rash driving.
- Possibility of overloading may injure the passerby public.
- The possibility of accident during vehicular movement in the mine in case pathway is not compacted or movement is at the embankment.
- All transportation within the mining lease working should be carried out directly under the supervision and control of the management.
- The vehicles will be maintained in good condition and checked thoroughly at least once a month by the competent person authorized for the purpose by the management.
- Road signs will be provided at each and every turning point up to the main road (wherever required).
- To avoid danger while reversing the equipments/vehicles especially at the working place/loading points, stopper should be posted to properly guide reversing/spotting operating, otherwise no person should be there within 10m radius of machine.
- The maximum permissible speed limit should be ensured.
- Overloading of material will be avoided.
- A statutory provision of the fences, constant education, training etc will go a long way in reducing the incidents of such accidents.

F. Accident during Mineral Loading and Transportation

- The mineral will be load in the trucks mechanically i.e. by Poclain and JCB. There is a possibility of injury to the person during loading operation at mine.
There is a possibility of riverbank collapse.

There is a chance of falling of animals/human into pits in river bed by overlooking of fenced area near working.

G. Other Possible Measures to Avoid Risks/Disaster Due To River sand Mining

- Unwanted material including mineral or spillage (if any) should not be stacked on the banks as it will hinder the flow of water in monsoon season.

- The minerals will be mined out in a uniform way so that the river flow/course will not be disturbed.

- River bank areas, under operation will be protected by avoiding unauthorized gravel excavation along rivers as that may cause instability to the river bank.

- River banks will not be excavated to form access ramps.

- Only excavated river gravel should be used to deposit against the river bank to form access ramps.

Disaster Management Plan (DMP)

The Disaster Management Plan for the proposed river sand mining project will cover hazard identification due to various mining and allied activities, the risk involved due to the hazards and planning the necessary mitigation measures for the same. The following natural/industrial hazards as follows:

- Failure of pit slope
- Accident due to transportation & other equipment etc.

Structure of the Disaster Management Plan

(i) Outline of Disaster Management Plan

The purpose of disaster management plan is to restore the normalcy for early resumption of mining operation due to an unexpected, sudden occurrence resulting to abnormalities in the course of mining activity leading to a serious danger to workers or any machinery or the environment. The following factors will play major role in the management strategy. The disaster management plan may be broadly divided into following steps as:
(ii) **System of Communication**

Where is an internal communication system for the department head and to their line of command with telephone. The telephone numbers and addresses of adjoining mines, rescue station, police station, fire service station, local hospital, electricity supply agency and standing consultative committee members are also maintained for any emergency requirement.

(iii) **Consultative Committee**

A standing consultative committee will be formed under the head of mines manager. The members consists of safety officer/medical officer/Asst. manager/ public relation officer/ Foreman/ and environmental engineer.

(iv) **Facilities & Accommodation**

Accommodation and facilities for medical centre, rescue room and for various working groups will be provided.

(v) **First Aid & medical facilities**

The mine management will have first aid/ medical centre for use in emergency situation. All casualties would be registered and will be given first aid. The centre will have facilities for first aid & minor treatment, resuscitation, ambulance and transport. It will have proper telephone/wireless set for quick communication with hospitals where the complicated cases are to be sent.

(vi) **Transport services**

A well defined transport control system will be provided to deal with the situation.

(vii) **Functions of Public Relations/ Responsibility of Mine Management**
(a) To make a cordial relation with government officials and other social service organization and working groups.

(b) To liaise with representatives of the mine to ameliorate the situation of panic, tension, sentiments, grievances and misgivings created by any disaster.

(c) To ameliorate the injured, survivors and family members of affected persons by providing material, moral support and establishing contact with relatives of victims.

**Offsite Emergency Plan**

Offsite emergency plan defining the various steps to tackle any offsite emergencies which may affect surrounding areas of the project has to be prepared after due final discussion with local panchayat and revenue officials. As per this offsite plan, actions have to be promptly initiated to deal with any offsite disastrous situation, with help of Collector and other officials.