

RISK ASSESSMENT REPORT

AND

DISASTER MANAGEMENT PLAN

RISK ASSESSMENT REPORT

1. Fall of sides

- Flatter slopes angles are adopted where occurrences of loose earth are encountered.
- No disaster like land slide, flood or inundation or fire is anticipated in this case.
- Unmanageable heights are not created.
- Loose rocks are properly dressed.
- Nature and structure of the rocks are properly studied for their slips.
- The faces will slope at 30°.
- The hanging wall, footwall & mineralized zone are competent to stand safely for long time.

2. Storage and use of explosives

- Proper and safe storage of explosives in approved and Licensed Magazine.
- Proper, safe and careful handling and use of explosives by competent Blasters having Blaster's Certificate of Competency issued by DGMS.
- Proper security system to prevent theft/ pilferage, unauthorized entry into magazine area and checking authorized persons to prevent carrying of match box, lights, mobile phones, cigarette or Beedi, etc.
- The explosives of class 2 will be used in their original cartridge packing and such cartridge shall not be cut to remove explosive for making cartridge of different size.
- Detonators will be conveyed in special containers. These will not be carried with other explosives.
- The holes which have been charged with explosives will not be left unattended till blasting is completed.
- Before starting charging, clear audible warning signals by Sirens will be given so that nearby people can take shelter.

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- Blasting operations will be carried out in day times only. However, in this project the mining operations are proposed to be carried out in day times.

3. Storage of oil and fuel

- Due care will be taken to avoid oil spillage.
- Storage will not be allowed beyond necessity.
- Fuel oil and lubricants will be stored only in approved containers in separate storerooms.
- Match box, lighters, mobile phone, dry wood, plastic paper sheets and smoking will not be allowed near the storage area.

4. Water

- Due care will be taken to provide channel all around the foot of the hill to collect run off and also to avoid soil erosion.
- There is no danger of flood or inundation as the proposed working is above the normal ground level. The area is not susceptible to floods.

DISASTER MANAGEMENT PLAN

During mining activities, proper measures will be taken to ensure safety at site. In order to handle disaster/ emergency situations, Management entrusting responsibility to Emergency Response Team will be prepared with their specific roles during emergency.

The possible composition of the Emergency Response Team (ERT) shall be: -

1. Mines Manager
2. Section In-charge
3. Site Controller
4. Transport Coordinator
5. Medical Coordinator

Infrastructure

Following infrastructure and operational system will be provided to meet any emergencies.

a. Emergency control room

This will be situated in an area away from the places of fire and will be provided with the following facilities: -

- Master plan of the mines.
- First aid boxes.
- Telephone line with STD facility.
- Loud hailers.
- Emergency lighting system.
- Stretchers.
- Transport facility.
- Emergency control room / site office will function as control base.

b. Assembly points

- Assembly points are to be set up farthest from the location of likely hazardous events, where pre-designated persons from the works, contractors and visitors would assemble in case of emergency.
- Up-to-date list of pre-designated employees of various departments must be available at these points so that roll call could be taken.
- Pre-designated persons would take charge of these points and mark presence as the people come into it.

c. Communication system

Different types of alarms to differentiate types of emergencies will be provided. Alarms will be followed by an announcement over Public Address System. In case of failure of alarm system, communication will be by telephone operator who will make announcement in ERT. Walkie-talkie and paging systems, using predetermined codes of communication, are very useful during emergency. If everything fails, a messenger will be used for sending the information.

d. Warning system and control

The Control Centers will be located at an area of minimum risk or vulnerability in the premises concerned, taking into account the wind direction, areas which might be affected by fire / explosion, toxic releases, etc. For promptness and efficiency, the premises / storage sites may be divided into number of zones, which should be clearly marked on the site plan.

e. Emergency services

This includes the fire-fighting system, first aid center, hospital etc. Alternate sources of power supply for operating fire pumps, communication with local bodies, fire brigade etc., will also be clearly identified. Adequate number of external and internal telephone connections will be installed.

f. Fire protection system

The fire protection system for the proposed mine will consist of,

- Hydrant system for all the areas of the mine.
- Portable hand appliances of suitable types/ capacities for extinguishing small fires in selected areas of the mine/storage areas.

OCCUPATIONAL HEALTH AND SAFETY

The main areas of concern for ensuring adequate occupational health and safety are: -

- All working places will have safe means of access, safe working platform and exit.
- Persons working in hazardous dust prone area will be provided with dust mask.
- Personal protective equipment like respirators, ear plug, noise muff, helmet etc. will be provided to the workers.
- Proper unit design and engineering controls in order to protect workers, including by control of process and fugitive emissions.
- Adequate arrangement of drinking water will be done.

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- Education & training will be provided to the workforce about facilities, protective equipment, risk associated, potential health effects, etc.
- Display board will be provided showing the hazards associated and recommended precautionary measures.

Medical Surveillance

Following tests are proposed during Medical Surveillance conducted for employees: -

Pre-employment medical check-up.

- Pulmonary Function Test
- Complete Physical Examination
- Blood Test
- Urine Test
- Chest X ray

Once in Six months medical check-up of each employee will be done. Individual medical record will be maintained.

Occupational Health

Occupational health needs attention during mining activities. The problem of occupational health in the mining operation and maintenance phase is primarily due to dust and noise which could affect the workers from respiratory and hearing problems.

The necessary personal protective equipment will be given to all the workers. The working personnel will be given the following appropriate personnel protective equipment.

- Industrial Safety Helmet;
- Cylindrical type earplug;
- Dust mask;
- Leather apron;
- Safety belt / line man's safety belt;

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- Leather hand gloves;
- Industrial safety shoes with steel toe.

Well-equipped medical facilities will be available round the clock for attending emergency arising out of accidents, if any. All working personnel will be medically examined at least once in every year and at the end of his term of employment. This is in addition to the pre-employment medical examination.

Safety plan

Safety of both men and materials during mining of operation phases is of concern.

Safety plan will be prepared and implemented in the proposed site. The preparedness of an industry for the occurrence of possible disasters is known as emergency plan.

The disaster is possible due to collapse of rock structures and fire/explosion etc.

Keeping in view the safety requirement during mining a safety policy will be formulated with the following regulations: -

- To allocate sufficient resources to maintain safe and healthy conditions of work;
- To take steps to ensure that all known safety factors are taken into account in the operation and maintenance of men, machinery and equipment;
- To ensure that adequate safety instructions are given to all employees;
- To provide wherever necessary protective equipment, safety appliances and clothing and to ensure their proper use;
- To inform employees about materials, equipment or processes used in their work which are known to be potentially hazardous to health or safety;
- To keep all operations and methods of work under regular review for making necessary changes from the point of view of safety in the light of experience and upto date knowledge;
- Provide appropriate facilities for first aid and prompt treatment of injuries and illness;

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- To provide appropriate instruction, training, retraining and supervision to employees in health, safety, first aid and to ensure that adequate publicity is given to these matters;
- To ensure proper implementation of fire prevention methods and an appropriate firefighting service together with training facilities for personnel involved in this service;
- To organize collection, analysis and presentation of data on accident, sickness and incident involving people injury or injury to health with a view to taking corrective, remedial and preventive action;
- To promote through the established machinery, joint consultation in health and safety matters to ensure effective participation by all employees;
- To publish / notify regulations, instructions and notices in the local language.
- To prepare separate safety rules for each type of occupation / processes involved in at site; and
- To ensure regular safety inspection by a competent person at suitable intervals of all buildings, equipment, work places and operations.

Safety organization

Conceptual / Planning Phase

A qualified and experienced safety officer shall be appointed. The responsibilities of the safety officer include identification of the hazardous conditions and unsafe acts of workers and advice on corrective actions, conduct safety audit, organize training programs and provide professional expert advice on various issues related to occupational safety and health. He is also responsible to ensure compliance of Safety Rules/ Statutory Provisions.

Safety circle

In order to fully develop the capabilities of the employees in identification of hazardous processes and improving safety and health, safety circles would be constituted in each

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area of work. The circle would consist of 3-5 employees from that area. The circle normally will meet for about an hour every week.

Safety training

Safety training will be provided by the Safety Officers with the assistance of faculty members called from Professional Safety Institutions and Universities. In addition to regular employees, limited contractor labors will also be provided safety training. To create safety awareness safety films will be shown to workers and leaflets will be distributed.

Some precautions and remedial measures proposed to be adopted to prevent fires are: -

- Spread of fire in horizontal direction would be checked by providing fire stops.
- Reliable and dependable type of fire detection system with proper zoning and interlocks for alarms are effective protection methods.
- Housekeeping of high standard helps in eliminating the causes of fire and regular fire watching system strengthens fire prevention and firefighting.
- Proper fire watching by all concerned would be ensured.

DRAINAGE MANAGEMENT

Before onset of monsoon, drains are cut along toe of the quarry faces to divert the surface run off. Garland drain is provided at the quarry top to regulate monsoon water and direct the same to the settling ponds / quarry pit to contain the quarry wash off and to avoid the same joining to the adjoining surface water bodies / water courses. It also helps to avert eventual collapses and damages to the quarry faces if any.

The quarry is currently designed to avoid surface water courses and drainage channels. Sources of contamination from the operation that could affect water quality include dust from blasting and refueling for equipment. Blast residues from explosives will be managed by ensuring that all material is ignited during the blasting process. Vehicle fueling will be conducted at a centralized fueling facility off site that has proper containment and spill response capability. Fueling for non-moveable onsite equipment, such as generators, will take place in a secured area with approved spill containment.