

Environmental Management Plan

1. Land Environment

The proposed project is on the river bed. The mining effect the land use pattern as the sand budget can be effected. In this project clay and silt will be produce as constituents of river bed mining which will be considered as waste.

Anticipated Impacts:

- Undercutting and collapse of river banks.
- River bank cutting and soil erosion.
- Upstream erosion as a result of an increase in channel slope and changes in flow velocity.
- Downstream erosion due to increased carrying capacity of the stream
- Downstream changes in patterns of deposition
- Changes in channel bed and habitat type

Mitigation measures

- Mineral will be mined out in central position of stream and sufficient safety barrier say 15% of width will be left towards bank side. So that the river flow/course will not get disturbed.
- The mining will be carried out in the non- monsoon seasons only, so that the excavated mineral will get replenished during every monsoon season.
- Grasses and bushes which have fibrous roots at the first instance are proposed to grown along the banks which enhances the binding properties of the soil. Hence protecting the banks.
- Restoration of bank will be ensured at the end of mine closure every year

2. Biological environment

The proposed Mining will not cause any adverse effects to the flora but it can adversely affect faunal population

The adverse impacts on fauna are mainly due to:

- Human Activity
- Noise
- Land Degradation
- Deforestation

The impact on the fauna of the buffer zone due to the mining activity will be marginal. As there are very few trees / shrubs in the area, deforestation will not be significant factor in impact on fauna.

Mitigation measures

Plantation will be carried out on approach roads and nearby vicinity at river banks areas will, over a period of time, upgrade the flora. Plantation activity over a period of time will create conditions favorable for faunal population also.

3. Air Environment

The major contribution of air pollution is by river bed mining, such as excavation, loading, transportation, hauling operation and handling of mineral viz. Sand, Bajari & Boulders. This will lead to momentary rise in the particulate matter (PM₁₀). The dust liberated in mining and other related operations is injurious to health if inhaled in sufficient quantity. As such there will be no noticeable impact on air quality.

Mitigation measures

As the proposed mining will be carried out in a scientific manner, not much significant impact is anticipated, however, the following mitigation measures will be taken to further minimize it:

- No mining will be carried out during the monsoon season to minimize impact on aquatic life which is mainly breeding season for many of the species.
- As the mining site has no vegetation, no clearance of vegetation will be done.
- Prior to closure of mining operations / during the rainy season the eroded bank will be restored / reclaimed to minimize negative impacts on aquatic habitats.
- Haul roads will be sprinkled with water which would reduce the dust emission, thus avoiding damage to the crops.
- Mining will be carried out on the dry part of the lease area to avoid disturbance to the aquatic habitat and movement of fish species.
- No discard of food, polythene waste etc will be allowed in the lease area which would distract/attract the wildlife.
- No night time mining will be allowed which may catch the attention of wild life.
- Access roads will not encroach into the riparian zones and if any riparian vegetation cleared off for the mining activity will be restored at the end of closure of mine.

4. Water Environment

Mining of sand, stone and bajari from within or near a river bed has a direct impact on the physico-chemical habitat characteristics, which include in stream roughness elements, depth, velocity, turbidity, sediment transport and stream discharge. Altering these habitat characteristics can have deleterious impacts on both in-stream biota and associated riparian habitat.

Anticipated impacts

The anticipated impacts are described below:-

- Alteration of flow pattern of river an excess of suspended sediment
- Damage to riparian vegetation and in-stream habitat
- The disturbance activities can also disrupt the ecological diversity in many ways.

Mitigation measures

- Mining will be done in the dry parts of river Ganga.
- Mining will be completely stopped during the rainy season.
- There will be no adverse effect on the surface water as the mining will be done only from river bed, not from the river. So the drainage pattern will not alter.
- The ground water also not gets affected as mining will be done up to 1m of depth or above the ground water level whichever comes first.
- Uncontrolled dumping of overburden is avoided and spillage of fuel in the water will be avoided.
- No waste water will be generated from the mining activity of minor minerals as the project only involves lifting of sand, Bajari & boulders from river bed.

5. Noise Environment

The exposures to excessive noise levels can lead to: Prevention of sleep, insomnia and fatigue.

- Decrease in speech reception, communication, distraction and diminished concentration thus adversely affecting job performance efficiency.
- Chronic psychological disturbance including impaired hearing.
- Irreparable cardiovascular, respiratory and neuralgic damages in certain extreme cases.

The area is general represents calm surroundings. There is no heavy traffic, industry or noisy habitation in the area except the existing mine. The other major industry like minerals grinding and crusher plants is far away. With the increase in scale of mining operations, deployment of machinery and vehicles operation and men and noise levels are expected to increase.

Mitigation measures

- Periodical monitoring of noise will be done.
- No other equipments except the transportation vehicles and Excavator for loading will be allowed.
- Noise generated by these equipments by these equipments shall be intermittent and does not cause much adverse impact.
- Proper maintenance of all equipments/ machines will be carried out which help in reducing noise during operations.
- Plantation will be taken up along the approach roads and vicinity of river bank. The plantation minimizes propagation of noise and also arrests dust.

6. MONITORING SCHEDULE FOR ENVIRONMENTAL PARAMETERS:-

PARTICULARS	MONITORING FREQUENCIES	IMP. MONITOR PARAMETERS
Ground Water	Twice in a year	pH, SS, TDS, Iron, Cl, Hardness, Alkalinity, NO ₃ , PO ₄
Ambient Air Quality	Twice in a year	SPM, SO ₂ & NO _x
Soil Analysis	Twice in a year	pH, conductivity, SO ₄ , NO ₃ , PO ₄ , Texture, Alkalinity
Noise	Twice in a year	Noise level in dB