EXECUTIVE SUMMARY

FOR

PROPOSED SAND BAJRI & BOULDER (MINOR MINERAL) MINING IN GOLA RIVER BED AT VILLAGE: BHORSA , DISTRICT- NAINITAL, UTTARAKHAND

APPLICANT

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1.1 PROJECT DESCRIPTION

1.1.1 Introduction

The proposed project is for mining of minor minerals from Gola river bed at Village- Bhorsa, Tehsil- Nainital, District- Nainital, Uttarakhand. The project is proposed by Kumaon Mandal Vikas Nigam Limited (KMVNL). The proposed project is categorized as category "B" as the mine lease area is 8 ha. Hence it will be considered at SEAC, Uttarakhand.

1.1.2 Project Importance

Due to continuous heavy rainfall & flooding annually during the recent past years, a large amount of sand/ bajri/ boulder has been deposited in the bed of river Gola which has widened the course of river and is also causing cutting of nearby agricultural and forest land causing heavy degradation and loss of soil and vegetation along the river course. Keeping in view the environmental consideration for the ecosystem of the river, it is essential to remove this material from the river bed.

Therefore, in order to channelize the river course, prevention of floods and land cutting from nearby agricultural fields and forests, it is necessary to remove river bed material from the proposed stretch in an area of 8 ha.

1.1.3 Project Nature, Size & Location

The project has been proposed for an annual production of 2,16,000 tonnes of Sand/Bajri/Boulder by open cast manual extraction method in river bed. The lease area is revenue waste land.

Geographical location of mine lease area is covered under Survey of India Toposheet No. 62C/4. Geographical location of the mine stretch is given below:

Latitude	29°16'49.2"N
Longitude	79°36'19.1"E

Site is well connected to existing road and rail network. Only temporary haul roads shall be maintained to facilitate proper plying of vehicles inside the mine lease area.

1.1.4 Method of Mining

As per Environmental Impact Assessment Guidance Manual for - Mining of Minerals released by MoEF - the project is a surface mining type. The typical operations involved in a surface mining is shown in the figure given below:

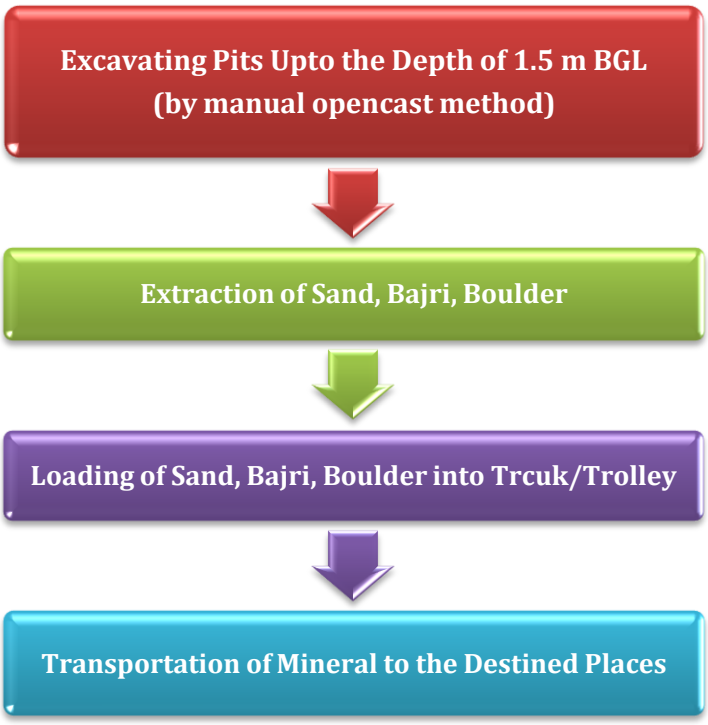

Figure (i): Schematic flowchart of minor mineral mining process

The mining will be done by fully manual opencast method of mining and does not involve any processes such as overburden removal, drilling, blasting and beneficiation.

- The mining process involves collection of material by simple hand tool such as shovel, pans, spade, pick axe and sieves.
- This is followed by manual sorting and picking, stacking and loading into trucks/ tractor–trolleys for transporting.
- The pits from where the material is picked are not deeper than 1.5 meter and shall follow the normal channel direction of the river. These get replenished during monsoon.
- The only waste is silt/clay which may be used for green belt development in identified area.
- The material will be transported through trucks, tractor trolleys, etc. to the storage points located outside the mining lease.

Mining will be carried out only during the day time. Extraction of sand, Boulder and bajri material will be completely stopped during the monsoon season.

1.1.5 Employment Potential

Only local labours shall be engaged for extraction and loading of mineral in mining area, as well as for watch & ward and plantation activity with proper maintenance. Beside this, KMVNL shall engage skilled and managerial staff to meet the statutory requirement. The total manpower required for the project, both skilled and unskilled, comes out to be 210 persons.

1.1.6 Water Requirement

Water requirement for the proposed project for domestic use, dust suppression and plantation, shall be met from the tanker water supply. The water is further required for sprinkling on haulage road which is done once in day using water tanker. Total water requirement shall be 10 KLD. The domestic water demand has been calculated as 5 KLD.

1.2 DESCRIPTION OF THE ENVIRONMENT

The baseline environment quality represents the background environmental scenario of various environmental components such as Land, Soil, Water, Air, Noise, Biological and Socio-economic status of the study area. Field monitoring studies to evaluate the base line status of the project site were carried out during the post-monsoon season, covering the months of October, November and December 2013. Environmental data has been collected to establish the base line status with respect to proposed mine for:-

- Land
- Water
- Air
- Noise
- Soil
- Biological
- Socio-economic status

1.2.1 Land Environment

LAND USE/ LAND COVER

The existing land use pattern of the study area based on the latest satellite imagery is given below:

Table (i): Land use pattern of the study area

S. No.	Land Use Category	Area (sq.km)	Land cover (%)
1.	Agriculture Land	61.15	19.46
2.	Settlement	15.90	5.06
3.	Forest Land	218.87	69.67
4.	Water bodies	14.46	4.60
5.	Waste Land	3.78	1.20
TOTAL		**314.16**	**100.00**

Seismicity of the area

The project site as well as study area lies in Zone-IV of Seismic Zoning Map, and thus can be said to be located in an area of high seismic hazard by national standards. Hence the risk of earthquake at the site persists though there has been no incident in the near past.

1.2.2 Soil Characteristics

Soil may be defined as a thin layer of earth's crust, which serves as a natural medium for the growth of plants. The soil characteristics include both physical and chemical details. The soil survey was carried out to assess the soil characteristics of the area. For studying soil quality of the region, 4 samples were collected to assess the existing soil conditions in and around the area.

Monitoring data shows that the texture of soil at all locations is Sandy Loam. The monitoring sites have sand ranging from 90% to 79% in soil samples. Silt content varies from 5% to 16%, while Clay content varies from 5% to 15% in the soil samples. The data shows that value of pH ranges from 8.14 at Forest land near mine site to 7.33 at Bhorsa village indicating that all soil samples are neutral. Bhauvasa shows maximum conductivity of 436 µmhos/cm, while Forest land near mine site shows minimum conductivity of 336 µmhos/cm. Values of CEC ranges from 6.8 meq/100g as lowest at Forest land near mine site and 7.6 meq/100gas maximum at Bhauvasa. Magnesium values ranges from 6.1 meq/100g as lowest at Forest land near mine site and 6.6 meq/100g as highest at Amiya. The average concentration of Nitrogen, Phosphorus and Potassium in the soil samples varies from 6.4 to 9.9 mg/100gm, 70.2 to 98.5 mg/100gm and 0.7 to 0.8 mg/100gm.

1.2.3 Water Environment

Ground water quality & Surface water quality

The assessment of present status of water quality within the study area was conducted by collecting water sample from ground water sources and surface water sources during the period of October'13 to December'13. The sampling locations were identified on the basis of their importance within the study area. Three ground water samples and two surface water sample were collected during the monitoring period.

The physico-chemical characteristics of Ground water are within the desirable limits specified for drinking water (IS:10500), and those of surface water sources are found within the limits prescribed by CPCB for Class A surface water sources..

1.2.4 Air Environment

Ambient air quality monitoring results reveals that the maximum value for PM_{10} is observed, as 55µg/m^3 at Pinrao and minimum value of 40 µg/m^3 at Amiya and mine site while 24 hours applicable limit is 100µg/m^3 for industrial and mixed use areas. The maximum value for SO_2 is observed, as 10.4µg/m^3 at Bhauvasa village & Pinrao and minimum value is 6.4 at Bhorsa village while 24 hours applicable limit is of 80µg/m^3 for residential, industrial and other areas. Average value of SO_2 is between 8.03-8.67µg/m^3. The area observes SO_2 well below the prescribed range. The maximum value for NO_2 is observed, as 18µg/m^3 at Amiya while 24 hours applicable limit is of 80µg/m^3 for residential, industrial and other areas. Average value of NO_2 is between 11.80-12.94 µg/m^3. The area observes NO_2 well below the prescribed range.

1.2.5 Noise Environment

In residential area, Leq (day) noise level are ranging between 52.7 dB (A) recorded near Jamrani road near mine site to 48.6 dB(A) recorded at pinrao during day time and Leq (night) of 41.8 dB(A) recorded at Jamrani road near mine Site to 40.4 dB(A) recorded at Pinrao during night time. During daytime and night time noise level within the residential area are well within the prescribed limit.

1.2.6 BIOLOGICAL ENVIRONMENT

The study area (of 10km radius) is rich in terms of biodiversity. The project site lies in Nainital district of Uttarakhand. The state of Uttarakhand is richly endowed with the natural resource of

forests. The forests in this region are dry and moist deciduous forests with traces of temperate forests towards the higher elevation areas.

The forests in the study area are as listed below:

Haldwani Forest	1.5 km, SE
Nainital Forest	1.2 km, NW

The study area comprises tropical, subtropical vegetation. While the Tarai & Bhabhar belt has the climate of the plains, the deep valleys in high altitude have plants of hills as well as the plains. The main species noted of trees are of economic and religious importance such as *Mangifera indica* (mango), *Emblica officinalis* (amla), (*Dalbergia sissoo*) shisham and *Cinnamomum tamala* (tejpatta) trees. Many trees have medicinal properties such as *Emblica officinalis* (Amla), *Azadirachta indica* (Neem), *Eucalyptus spp. etc.* A large number of fauna are reported from the study area. Various kinds of birds are found flying across the project area. There are no nesting sites on the project site. Some of the birds commonly spotted in the project site are crow (*Corvus splendens, Corvus macrorhynchos*), wood peckers (*Dinopium benghalense*), pigeon (*Columba livia*) and doves (*Streptopelia decaocto, Streptopelia chinensis*). No migratory species of birds are spotted at the project site.

1.2.7 Socio-Economic Environment

Human Settlement

The proposed River bed mine of Gola River project covers 26 major villages of the study area. The total population of study area is **390798** the percentages of male & female population are **52.12% & 47.88%** respectively.

Employment

Implementation of the Gola River bed Mine project will generate both direct and indirect employment. The economy of the area is dependent mainly on agriculture. The occupational structure of the population in the study area has been studied with reference to the main workers are 25.36%, cultivator 61.54% and 54.39% Agricultural workers, 17.90% of others workers .

1.2.8 ANTICIPATED IMPACTS & MITIGATION MEASURES

S.No.	Aspect	Impact	Mitigation measure
A.	**Land Environment**	• The mine working will remain confined to river bed lot only and in no case disturbing any surface area outside which may affect topography or drainage. • Mining pits will impact river bed topography by formation of excavation voids.	• Adopting suitable, site-specific mitigation measures can reduce the degree of impact of mining on land. Some of the land-related mitigation measures are as follows: • Excavated pits will get replenished annually in monsoon itself & will be restored to original.
B.	**Water Environment**	• Mining activity may intersect groundwater level. • No waste water will be generated from the mining activity of minor minerals as the project only involves extraction of Sand, Bajri & boulders from river bed.	• Mining operation shall be undertaken up to the depth of 1.5 meter, hence there shall not be noticeable effect on surrounding ground water resources due to mining. • Mining in the area will be done well above the water table as well as river bed water level therefore; much impact on water regime is not anticipated. • The sand, bajri and boulder mining activity will not have any significant impact on the water environment of the region.
C.	**Air Environment**	• Mining Operation carried out by opencast manual method will generate dust particles during extraction, loading & unloading of sand/bajri/boulder and during transportation. • The dust liberated in mining and other related operations is injurious to heath if inhaled in sufficient quantity.	• Proper mitigation measures like water sprinkling will be adopted to control dust emissions. • Masks will be provided to workers. • To control the emissions regular preventive maintenance of equipment will be carried out on contractual basis.

S.No.	Aspect	Impact	Mitigation measure
		• Gases, such as, Sulphur Dioxide, Oxides of Nitrogen etc. from vehicular exhaust.	
D.	**Noise Environment**	• The source of Noise pollution will be the vehicular movements. • Noise will be generated by the digging of mine area using shovels, crowbars will be negligible.	• Proper maintenance of all transportation vehicles will be carried out which will help in reducing noise during operations. No other equipments except the transportation vehicles will be allowed. • Noise generated by hand equipments shall be negligible and does not cause much adverse impact.
E.	**Biological Environment**		
i.	**Flora**	• The proposed project of river bed sand, bajri, boulder mining shall be carried out on the riverbed of Gola river. There are no trees in the mine lease area. The project shall also not lead to any change in landuse and the voids will be replenished every year after successive rains. The proposed mining activity, which although is an economically gainful activity, also constitutes river training work. It allows for necessary dredging activity which may otherwise lead to flooding of the valley. • There shall be negligible air emissions or effluents from the project site during loading of the truck. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly.	• Although, the project will not lead to any tree felling, plantation activities shall be undertaken to improve the vegetation cover of the area. To avoid dust emissions, the mined materials will be covered with tarpaulin during transportation.
ii.	**Fauna**	• Animals are sensitive to noise and avoid human territory. The project stretch of the river is not an identified drinking water point for the animals. However, any animal desirous of accessing the river can continue to do so upstream or downstream of the stretch during the mining activities, as there will not	• The workers shall be directed to not venture out of the leased area for collecting fuel wood, or hunting. They shall also be trained not to harm any wildlife. No work shall be carried out after sunset.

S.No.	Aspect	Impact	Mitigation measure
		be any damming or diverting of water. Hence, no significant impact is anticipated from the proposed project.	
F.	**Socio-Economic Environment**	• From the primary Socio-economic survey & through secondary data available from established literature and census data 2001 & 2011, it is found that Socio-economic condition of the nearby area is good. They have ample opportunity for employment and there is positive impact on the current employment scenario as the purposed project will create additional job opportunities. • The villages and their inhabitants in the buffer zone will not be disturbed from their settlements due to the mining operations. There is no inhabitation within the lease area. Therefore neither villages nor any part of village or any hamlet will be disturbed during the entire life of the mine. As the mining operations will not disturb or relocate any village or settlement, no adverse impact is anticipated on any human settlement. • The main source of employment of local people depends upon agriculture, which is seasonal. In the absence of any high employment potential activities, the people are economically backward. The mining operations are providing employment to 210 people.	• Through mining activities, jobs and opportunities will be created for local people, and significant contributions are made to the State's economy. Mining can generate a significant source of revenue through profit related royalty payments and fixed taxation. • It is suggested that during mining the site services like rest room shelter, first aid box, drinking water & toilet facilities of a portable toilet and portable disposal system of fecal sewage will be provided for the workers at the mine site.

1.2.9 ENVIRONMENT MONITORING PROGRAMME

Regular monitoring programme of the environmental parameters is essential to take into account the changes in the environmental quality. The objectives of monitoring are to:

- Verify effectiveness of planning decisions;
- Measure effectiveness of operational procedures;
- Conform statutory and corporate compliance; and
- Identify unexpected changes.

Details of the Environmental Monitoring schedule, which will be undertaken for various environmental components, are detailed below:

S. No.	Activity	Schedule
Air Pollution Monitoring		
1.	Ambient air monitoring of parameters specified by CPCB in their air consents from time to time within the mining lease	Once in every season except monsoon
2.	Ambient air monitoring of parameters specified by CPCB in their air consents from time to time at stations outside the mining lease	Once in every season except monsoon
Water Quality Monitoring		
3.	Monitoring of Ground Water sample as per IS: 3025 and compared with the drinking water standards, prescribed in IS:10500.	Once in every season
4.	Monitoring of Surface Water sample as per IS: 2296	Once in every season
Noise Quality Monitoring		
5.	Noise in the ambient atmosphere near the mine lease area	Once in every season
Greenbelt Maintenance		
6.	Monitor schedule for Greenbelt development as per approved mining plan	Once in a year
Soil Quality Monitoring		
7.	Soil quality analysis from the samples collected from the mine site and nearby area	Twice in a year on the basis of 6 months interval

1.2.10 PROJECT BENEFITS

Various benefits are envisaged while planning for the mining of minor minerals and a grief description of the advantages and benefits anticipated from the proposed project to the locality, neighborhood, region and nation as a whole is as follows.

- Removal of river bed material will channelize the river course, and control soil erosion from nearby forest and agricultural land.
- It will cater the demand of raw material for construction purpose
- Awareness program and community activities, like health camps, medical aids, family welfare programs, plantation etc.
- The proposed project is expected to provide employment to local people in different activities such as Mining, sizing (sieving), transportation and plantation activities. The project activity will not have any significant negative impact on the environment.
- Development of green belts.

1.2.11 COST OF ENVIRONMENT CONTROL MEASURES

As a part of responsibility towards protection of environment, project proponent has allocated budget for regular Environment monitoring and Environmental management. The same is detailed in **Table (ii & iii).**

Table (ii): Proposed Cost of Environment Monitoring

Components	Schedule and Duration of Monitoring/Execution	Implementing Agency	Approximate Unit Cost (per location)	Total Cost in Rs. (per year)
Air	Once in every season except monsoon	KMVNL	Rs. 5,000/-	75,000
Water	Once in every season	KMVNL	Rs. 3,000/-	24,000
Noise	Once in every season	KMVNL	Rs. 3,000/-	36,000
Soil	Twice in a year	KMVNL	Rs. 3,000/-	12,000
TOTAL				1,47,000

Table (iii): Proposed Cost of Environment Management

Sr. No.	Item	Annual Cost (Rs)
1.	Provision of dustbins - onetime	2,000
2.	Face Masks	5,000
3.	Goggles	3,000
4.	Boundary demarcation	25,000
5.	Plantations	30,000
6.	Raising awareness	35,000
Total		1,00,000