# EXECUTIVE SUMMARY FOR "PROPOSED SAND BAJRI & BOULDER (MINOR MINERAL) MINING ON THE BED OF NANDHAUR RIVER (AREA- 468 HA.) AT DISTRICT- NAINITAL & UDHAM SINGH NAGAR, UTTRAKAHND

**PROJECT PROPONENT**

**M/s UTTARAKHAND FOREST DEVELOPMENT CORPORATION**

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**Prepared By**

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*QCI/NABET Accredited EIA Consultant at S.No.110 as per List of Accredited consultant Organizations/Rev.41/May.09, 2016 and MoEF & NABL approved Laboratory*

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# EXECUTIVE SUMMARY

## *1.0 Project Description*

### *1.1.1 Introduction*

The proposed project is for mining of Sand, Bajri & Boulder (minor mineral) from Nandhaur/Kailash River bed located at near villages-Chorgalia, Amkhera, Dharampur, Ghunsapur, Maira Barahrana, Ukroli, Bindara Tehsil- Haldwani , District- Nainital & Udham Singh Nagar, Uttarakhand. Mine has been allotted in the name of M/s UKFDC vide Letter of Intent (LOI) no. 238/Khanan/LOI/V.VI.NI/BHU.KHANI.E/2014-2015 dated 23.07.2015 by Director of Mines & Geology Department, Uttarakhand and The proposed project is categorized as category "A" as the mine lease area is 468 ha. Hence it will be considered at MoEF, New Delhi.

### *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 Nandhaur/Kailash 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 468 ha.

### *1.1.2 Project Nature, Size & Location*

The project has been proposed for an annual production of 46,20,000 tonnes of Sand/Bajri/Boulder by open cast manual extraction method in river bed. The lease area measuring 468 ha is falling totally under the forest land.

Geographical location of mine lease area is covered under Survey of India Toposheet No. 53O/12. Geographical location of the mine stretch is given below:

| | |
|---|---|
| Latitude | $29^0$ 02' 4.7" N to $29^o$ 07' 15.8" N |
| Longitude | $79^0$ 41'40.8" E to $79^0$ 42' 51.0" E |

The mining site is well connected through rail & road network. Mine site is approachable by motor road connecting NH-125 at a road distance of 11.85 Km. Only temporary haul roads shall be maintained to facilitate proper plying of vehicles inside the mine lease area.

### *1.2 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:

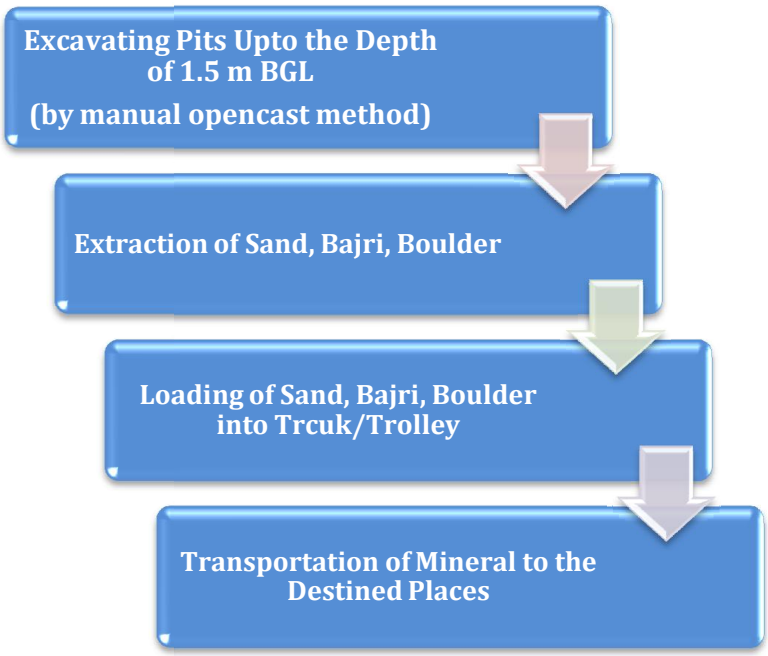


Figure: Schematic flowchart of minor mineral mining process

The project will be accomplished 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 sorting and manual picking, stacking and loading into trucks/ tractor–trolley for transporting.

•The only waste is silt/clay which will be added back to the pits for backfilling or can be used for plantation purpose.

•The material is transported through tipper (9.0 to 10.2 metric tonnes), tractor trolley small (3 metric tonnes), tractor trolley big (6 metric tonnes) 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.

### *1.2.1 Employment Potential*

The local labour shall be engaged for extraction and loading of mineral in mining area, besides, watch and ward and plantation activity with proper maintenance. Beside this, UKFDC 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 4410.

### *1.2.2 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. Total water requirement shall be 18.0 KLD. The domestic water demand has been calculated as 4.0 KLD and for dust suppression 6.0 KLD, Green belt development 8.0 KLD.

### *1.2.3 Project Cost*

Estimated project cost is 245.54 lacs.

### *1.3 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 winter season, covering the months of December 2015-February 2016.

#### *1.3.1 Land Environment*

##### *1.3.1.1 LAND COVER/ LAND USE*

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

*Table 1: Land use pattern of the study area*

| S.No | Classes | Area (sq.km) | Area in % |
|---|---|---|---|
| 1 | Agriculture | 171.42 | 32.27 |
| 2 | Settlement | 298.88 | 56.26 |
| 3 | Forest Land | 2.56 | 0.48 |
| 4 | Waste Land | 18.91 | 3.56 |
| 5 | Water Bodies | 39.47 | 7.43 |
| Total | | 531.24 | 100.00 |

##### *1.3.1.2 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.

1.3.1.3 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 5 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 65% to 76% in soil samples. Silt content varies from 10% to 22%, while Clay content varies from 11% to 18% in the soil samples.

The data shows that value of pH ranges from 6.85 at Nalai to 7.87 at Chorgalia indicating that all soil samples are neutral.

Mirbara Rana shows maximum conductivity of 432 µmhos/cm, while Chorgalia shows minimum conductivity of 345 µmhos/cm.

Values of CEC ranges from 1.89 meq/100g as lowest at Gangapur and 4.1 meq/100gas maximum at Mirbara Rana.

Magnesium values ranges from 1.62 meq/100g as lowest at Mirbara Rana and 3.5 meq/100g as highest at Mukhani Joga. The average concentration of Nitrogen, Phosphorus and Potassium in the soil samples varies from 9.1 to 14.2 mg/100gm, 78 to 85.8 mg/100gm and 2 to 5 mg/100gm.

### 1.3.1.4 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 December 2015 to February 2016. The sampling locations were identified on the basis of their importance within the study area. Two ground water samples and one surface water sample were collected during the monitoring period.

The physico-chemical characteristics of Ground water & Surface water are found within the limits, prescribed by CPCB.

#### *1.3.1.5 AIR ENVIRONMENT*

The maximum value for $PM_{10}$ is observed, as 59 µg/$m^3$ at Gangapur and minimum value of 41 µg/$m^3$ at Mukhani joga while 24 hours applicable limit is 100µg/$m^3$ for industrial and mixed use areas. The average value ranges between 46 to 53 µg/$m^3$ . The maximum value for $SO_2$ is observed, as 16.8µg/$m^3$ at Mirbara Rana and minimum value is 3.3 at Gangapur while 24 hours applicable limit is of 80µg/$m^3$ for residential, industrial and other areas. Average value of $SO_2$ is between 9.89 to 13.19 µg/$m^3$. The maximum value for $NO_2$ is observed, as 24.6 µg/$m^3$ at Mukhani Joga & minimum values is 12 µg/$m^3$ at Mirbara Rana while 24 hours applicable limit is of 80µg/$m^3$ for residential, industrial and other areas. Average value of $NO_2$ is between 17.33 to 20.76 µg/$m^3$.

#### 1.3.1.6 Noise Environment

*Study Area*: In study area, Leq (day) noise level are ranging between 50.4 dB recorded Gangapur to 46 dB recorded at Mirbara Rana during day time and Leq (night) of 40.7 dB recorded at Gangapur to 35.1 dB recorded at Mukhani Joga during night time. During daytime and night time noise level within the residential area are well within the prescribed limit

#### *1.3.1.7 BIOLOGICAL ENVIRONMENT*

The study area (of 10km radius) is rich in terms of biodiversity. The project site lies in Nainital & Udam Singh Nagar 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.

Many of the trees are of economic and religious importance such as *Mangifera indica* (mango), *Emblica officinalis* (amla), (*Dalbergia sissoo*) shisham and *Cinnamomum tamala* (dalchini) 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 out of which 12 are schedule I & II species. 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*).

#### *1.3.1.8 SOCIO-ECONOMIC ENVIRONMENT*

The study area covers all the villages/ part of villages located in the 10 Km radius around the project area periphery. In case of Nandhaur/Kailash River bed mine (468 Ha.) project at 39 village in Tehsil Haldwani & 10 village in tehsil Gadarpur, the study area is spread over 49 villages in district of Nainital & Udham singh Nagar in the state of Uttarakhand. The total population of study area is 64751 the percentages of male & female population are 51.54% & 48.4% respectively. The Schedule Caste (SC) population within the study area is 13.23 % of the total population with 51.95 % Male and 48.05% are female. The total number of literate within the study area is 38096 which are 58.83% of total population. The number of total workers in the study area is 24286 which are 37.51% of total population. Out of which 72.91% is male and only 27.09% is female.

### *1.4 Anticipated Impact and Mitigation Measures*

#### *1.4.1 Land Environment*

***Anticipated Impact***

- Mining activity will impact river bed topography by formation of excavation voids.
- River bed mining may bring in some change in topography at the nearby area of the mine lease.
- Stacks of solid waste generated from mining activity may hinder the flow of water in monsoon season.

**Mitigation Measures**

- Excavated pits will get replenished annually in monsoon itself & will be restored to original.

- The mine working will remain confined to allotted river bed only, so it will not disturb any surface area outside the mine lease area which may affect topography or drainage.

### *1.4.2 Water Environment*

***Anticipated Impact***

- River recharges the groundwater; excessive mining will reduce the thickness of the natural filter materials (sediments), through which the ground water is recharged.
- Mining activity may intersect groundwater level.
- Waste water generated from the mining activity will cause water pollution.

***Mitigation Measures***

- Restriction in excavation depth will be made compulsory to avoid reduction in the thickness of the natural filter materials
- 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.
- 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.

### *1.4.3 Air Environment*

***Anticipated Impact***

- Mining Operation carried out by opencast manual method generate dust particles due to 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.
- Gases, such as, Sulphur Dioxide, Oxides of Nitrogen etc. from vehicular exhaust.

***Mitigation Measures***

- 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.

### *1.4.4 Noise Environment*

***Anticipated Impact***

- The source of Noise pollution will be the vehicular movements.
- Noise will be generated by the digging of mine area using shovels, crowbars etc.

***Mitigation Measures***

- Proper maintenance of all transportation vehicles will be carried out which help in reducing noise during operations. No other equipments except the transportation vehicles will be allowed.
- Noise generated by hand equipments shall be intermittent and does not cause much adverse.

### *1.4.5 Biological Environment*

***(A) Flora***

***Anticipated Impact***

- The proposed project of river bed sand, bajri, boulder mining shall be carried out on the riverbed of Nandhaur/Kailash river. There are no trees in the project area. The project shall also not lead to any change in landuse and 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.

***Mitigation Measures***

Although, the project will not lead to any tree cutting, 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.

**(B) Fauna**

***Anticipated Impact***

- 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 be any damming or diverting of water.
- Hence, no significant impact is anticipated from the proposed project.

***Mitigation Measures***

- 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.

### *1.4.6 Socio-Economic Environment*

***Anticipated Impact***

- From the primary Socio-economic survey & through secondary data available from established literature and census data 2001 & 2011, it is found that there would be positive impact on Socio-economic condition of the nearby area.
- As the project is proposed Government forest land, no Resettlement & Rehabilitation is required.

- Increased funding to improve social infrastructure and cultural maintenance programs.
- The area is poor in the health care facilities. The project authorities would provide mobile vans for emergency services in the area.
- Various direct and indirect employment opportunities will be generated. Per capita income of local people will improve.

***Mitigation Measures***

- It is suggested that during mining all safety provision has to be ensured to negate any likely impact on social environment due to associated hazards.
- A better standard of living due to increased access to employment, business opportunities training and education.

### *1.5 Environment Monitoring Programme*

Regular monitoring programme of the environmental parameters is essential to take into account the changes in the environmental quality. Air, Water, Soil & 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:

### *1.6 Project Benefits*

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

- 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 major impact on the environment.
- Development of green belts.

### *1.7 Environment Management Plan*

#### *1.7.1 Land Environment*

- Mineral will be mined out in central position of stream and sufficient safety barrier say 25% of width will be left towards bank side, So that the river flow/course will not get disturbed.
- The pits from where the material will be picked should not get deeper than 1.5 meter & shall follow the normal channel direction of the river.
- Pits will get replenished naturally every year after monsoon.

#### *1.7.2 Water Environment*

- Water requirements for drinking, plantation and dust suppression will be met by tanker supply on the daily basis.
- Local people will be employed and no permanent housing will be done so no permanent drainage pattern for sewerage system is required as domestic sewage shall be disposed off into septic tank followed by soak pits.
- Mining in the area will be done up to depth of 1.5m from the surface level well above the ground water table, therefore impact on water regime is not anticipated.
- Monitoring of water quality of nearby surface water, ground water and domestic water will be conducted once in every season except monsoon to evaluate the performance of the mitigation measures.

#### *1.7.3 Air Environment*

- Water should be sprinkled on these roads periodically every-day (twice in a day), to wet the surface.
- The un-metalled haul roads should be adequately compacted before being put into use.
- Over loading of transport equipments should be avoided to prevent spillage.
- Transportation of sand, bajri & boulder should be in covered vehicles to prevent fugitive dust emission.
- Regular checking and maintenance of vehicles should be conducted once in every two months and pollution under control certificate be obtained.
- It will be ensured that all transportation vehicles carry a valid PUC certificate.
- Masks will be provided to the workers daily during working hours of the mine.
- Plantation will be taken up along the approach roads and vicinity of river bank. The plantation arrests dust

### *1.7.4 Noise Environment*

- Proper maintenance of hand equipments will be carried out every month, which will help in reducing generation of noise during operations.
- Regular checking and maintenance of vehicles should be conducted once in every two month to avoid noise pollution.
- Ear plugs will be provided to workers during the operational hours of mine.
- Periodical monitoring of noise will be done to adopt corrective actions wherever needed.
- Plantation will be taken up along the approach roads and vicinity of river bank. The plantation minimizes propagation of noise and also arrests dust.

### *1.7.5 Biological Environment*

- The project area shall be strictly used for only the activities permitted.
- *Boundary Demarcation*: The boundary of the leased area will be marked prior to start of work at the site. All workers shall be informed of the boundary of the project

and the forest. No trespassing of the workers into the adjoining forest land shall be permitted.

- *Green Belt*: The project will not lead to any tree cutting. However, as social responsibility, greenery will be developed within two km of the project area. About 154.44 ha of panchayat land in consultation with the local panchayats will be identified. Community services will be deployed in raising these plantations. Trees of economic importance and native origin such as fruit trees shall be planted. The trees proposed for plantation are:
  - *Ailanthus excela (mahaneem)*
  - *Spondias pinnata (aamra)*
  - *Mangifera indica (aam)*
  - *Emblica officinalis (amla)*
  - *Tamrindus indica (imli)*
  - *Cinnamomum tamala (tezpatta)*
  - *Ziziphus mauritiana (ber)*
  - *Aegle marmelos (bel)*
  - *Madhuca indica (mahua)*
- *Restricted activities*: All mining activity shall be carried out manually. No explosives and heavy machineries shall be used.
- *Dust Suppression*: The sand being transported will be wet for a significant part of the year. No dust generation is anticipated during this period. On other occasions, all loaded trucks shall be covered with tarpaulin prior to transportation to avoid sand deposition on roadside vegetation and agriculture farms.
- *Project Timings*: Animals are sensitive to noise. Hence, no project activities shall be carried out at night (sunset to sunrise). At daytime, public addressal system (other than during emergency conditions) shall be avoided.
- *Training*: All workers shall be trained on the do's and don'ts of working on forest land. They shall not be allowed to collect fuel-wood from the adjoining forests. They shall be informed of the animals, they might spot in the project area and instructed

against harming any of them. The workers shall be directed to use sanitation facilities provided and not litter the project site.

### *1.7.5 Socio-Economic Environment*

- The villages and their inhabitants in the buffer zone will not be disturbed from their settlements due to the mining operations.
- The mining operation will provide employment to local people through various direct and indirect opportunities.

### *1.7.6 Occupational Health & Safety*

- Safety of employees during operation of mines should be as per the mines rules and as per guideline of Director General of Mines Safety (DGMS). The following measures relating to safety and health should be incorporated.
- Conduct of mock drill
- First Aid facility and training to workers
- Provisions of rest shelter for mine workers with facility of drinking water.
- Periodical medical examination of all workers

UKFDC will try to achieve targets of zero fatalities and injuries, silicosis elimination and the elimination of noise-induced hearing loss by constant and continuous improvement, at least equivalent performance levels to current national benchmarks.

### *Cost of CSR*

The total cost of CSR is Rs.2.0 lacs.

### *1.7.7 Solid Waste Management*

- No solid waste is generated from the mining operations. Unwanted material including silt mixed sand will not be stacked on the banks sides as it will hinder the flow of water in monsoon season. It will be backfilled in the excavated pits or used for plantation purpose. Thus, no waste dump sites are needed for the project. For domestic sewage, it shall be disposed off into septic tank followed by soak pits.

### *1.7.8 Cost of Environment Control Measures*

The total cost of EMP is Rs. 12.45 Lacs

### *1.8 Conclusion*

All possible environment aspects have been adequately assessed and necessary control measures have been formulated to meet statutory requirements. Thus implementing this project will have positive impacts.