

MINE PLAN

CHAPTER-1

1.0 INTRODUCTORY NOTE

The Letter of Intent (LoI) was granted vide GO No. **1081 /VII-1/2018/20kha/2018, dated 10 July 2018**, to Sh. Abhishek Rawat S/o Sh. Sham Singh Rawat R/o- Dharchula Road, Siltham District-Pithoragarh, Uttarakhand as per **Uttarakhand Notification No.1582/VII-1/2017/31kha/17, dated 31 October 2017** under Uttarakhand Minor Mineral Rules (Revised) 2017, for extraction of Sand Bajri and Boulder through E-tender/E-auction floated by Geology & Mining Unit, Department of Industries, invitation letter No. 05_Pithoragarh_Jamradi Rantada_0.482 ha /e.niwi.shahe nila /Bhu.khani.e./ 2017-2018 Dated-07 February 2018 & amended advertisement no.05_Pithoragarh_Jamradi Rantada _0.482/bhu.khani.e./e.niwi.sah e.nila./2017-18, dated 23 February 2018, under minor mineral policy 2017, rule no. 27Ga. (second stage) sub rule 5, declared as H1 (highest auction value), in a part of Village- Jamradi Rantada, Khasara No. 8114, 8115, 8228, 8212, 8229, Area- 0.482 Hectare. Proposed SAND, BAJRI AND BOULDERS MINE, in Village- Jamradi Rantada, Tehsil- Pithoragarh, District- Pithoragarh Uttarakhand, Applicant Sh. Abhishek Rawat S/o sh. Sham Singh Rawat is a very small 'B2' category mine as per explanation furnished in MCDR, 1988 i.e. manual opencast mines not using explosives. Mine Plan for this project under revised guidelines discussed here in this Report.

VILLAGE	TEHSIL	DISTRICT	AREA (HA.)	MINERAL
Village- Jamradi Rantada	Pithoragarh	Pithoragarh	0.482 Hectares	RBM



CHAPTER-2

2 GENERAL

1.1	Name of the applicant	Shri Abhishek Rawat S/o Shri Sham Singh Rawat
	Address	R/o- Dharchula Road, Siltham
	District	Pithoragarh
	State	Uttarakhand
	Pin Code	-
	Phone	-
1.2	Status of the applicant	Private Individual
1.3	Mineral(s) which the applicant intends to mine	(RBM) Sand, Bajri and Boulder etc. The mineral collected/extracted from the proposed lease area shall be sold in the open market as per the demand.
1.4	Period for which the mining lease is required or granted / renewed	State Government has released the Letter of Intent (LoI) for the project vides GO No. 1081/VII-1/2018/20Kha/2018, dated 10 July 2018, Area 0.482 ha. (LoI G.O. attached as Annexure I)
1.5	Name of the RQP preparing the mining plan	Bhuwan Joshi
	Address	Kamal Bhawan, House No. 6, Vijay Colony Lane No. 1, New Cantt Road, Dehradun (Uttarakhand) 248001
	Phone	09412152105
	Fax	-



	Registration No.	RQP/DDN/180/2009/A
	Valid upto	30/08/2019
1.6	Name of the prospecting agency	The baseline data is collected from various reports, proponent, as well as detailed prospecting of the area is carried out by the RQP

CHAPTER-3

3.0 PROJECT DESCRIPTION



3.1 NEED OF THE PROJECT

For meeting the huge demand of construction material like coarse and fine aggregate required in building construction and infrastructure works in Pithoragarh division of the State of Uttarakhand, the natural available materials in Village- Jamradi Rantada, Tehsil- Pithoragarh, District- Pithoragarh, Uttarakhand, has been found suitable from techno-economic consideration. Sand, Bajri and Boulder are use in constructing infrastructure, building, highways, roads, townships, multiplexes, foundations of buildings and industrial units etc. and are an integral part of development. Over the millennia, the weathering effect, the flow of water at high velocities in rivers and the pressure of water from the high mountainous reservoirs converted and pushed the hard ground underneath into sand, gravel etc. which travelled as sediments with the flow. This sand gets deposited along the river course wherever conditions were favorable. In deep past this settled sand was not extracted in a quantity in which it is deposited, since due to less population the requirement was not enough. As a result of continuous deposit of sand, bajri etc, the river course continued changing by widening itself, eroding the fields and expanding. This started resulting in floods, inundation and breaking their banks, causing devastation of property and loss of life. There has been a severe impact on every aspect of the environment. Thus there was a need for channelization of rivers for which extraction of sand through mining was expedient. The haphazard mining of river bed material being practiced for now long through unregulated, uncontrolled and illegal manner added almost an irreversible damage to the environment, which became a cause of serious concern. Though sand is very important mineral source for development, its mining through scientific methods have also become equally imperative. It is for this purpose that 'mining plan' is being drawn so that all its aspects are taken care of justifiably, according to law, protecting the environment, removing all adverse impacts and creating a direct and indirect employment opportunities, improving socio-economic conditions of the local inhabitants and all round status of life, achieving thereby a sustainable development. Besides above, the process of mining of minor minerals is a constant source of revenue generation to the State Government through Royalty. The mining project shall also be helpful in providing direct employment to many people. Additional jobs are created by way of transportation.

3.1.1 Project benefits



Physical benefits: Road Transport, Market, Enhancement of green cover & Creation of community assets.

Social benefits: Increase in Employment Potential, Contribution to the Exchequer, Increased Health related activities, Educational attainments & Strengthening of existing community facilities.

Environmental benefits:

- Controlling river channel.
- Protecting of river banks
- Reducing submergence of adjoining agricultural lands due to flooding.
- Reducing aggradations of river level.
- Protection of crops being cultivated along the river bank.
- A check on illegal mining activity.

3.2 PROJECT BACKGROUND

The Letter of Intent (LoI) was granted vide GO No. **1081/VII-1/2018/20Kha /2018, dated 10 July 2018**, to Sh. Abhishek Rawat S/o Sh. Sham Singh Rawat Resident R/o- Dharchula Road, Siltham, District- Pithoragarh as per **Uttarakhand Notification No.1582/VII-1/2017/31kha/17, dated 31 October 2017** under Uttarakhand Minor Mineral Rules (Revised) 2017, for extraction of Sand, Bajari, Boulders etc (RBM) through E-tender/E-auction floated by Geology & Mining unit, Department of Industries, in a part of village- Jamradi Rantada in Khasara No. 8114, 8115,8228 Ma, Area- 0.482 Hectares. This mine plan is being prepared to abide by change in Mining Policy as per Gazette of Uttarakhand State Government, Industrial Development Section No. 1033/VII-1/2015/146- ख /2010 dated 31st July, 2015 & **Uttarakhand Notification No.1582/VII-1/2017/31kha/17, dated 31 October 2017** under Uttarakhand Minor Mineral Rules (Revised) 2017.

CHAPTER-4

4.0 LOCATION, GENERAL AND ACCESSIBILITY



4.1 LOCATION

(a)	Details of Area	Location Map is attached as Plate No. 1
(b)	District and State	Pithoragarh, Uttarakhand
(c)	Tehsil	Pithoragarh
(d)	Village	Jamradi Rantada
(e)	Khasra No./ Plot No./ Block Range /	Village- Jamradi Rantada, Khasara No. 8114, 8115, 8228, 8212, 8229 Area- 0.482 Ha.
(f)	Felling Series etc.	None
(g)	Area (hectares)	0.482 Ha.
(h)	Whether the area is in forest (please specify whether protected, reserved etc.)	No, area does not fall under forest area
(i)	Ownership/ Occupancy	Letter of Intent GO released as per Notification No. 1081/VII-1/2018/20kha/2018, dated 10 July 2018 under Uttarakhand Minor Mineral Rules (Revised) 2017 for mining of minor minerals by Department of Industrial Development Department, State Govt. (Attached as Annexure I)
(j)	Geographical Coordinates	<ul style="list-style-type: none"> • Latitude- 29°28'18.823"N • Longitude- 80° 9'2.120"E • Latitude- 29°28'19.344"N • Longitude- 80° 9'2.975"E • Latitude- 29°28'19.451"N



		<ul style="list-style-type: none"> • Longitude- 80° 9'3.529"E • Latitude- 29°28'19.495"N • Longitude- 80° 9'5.970"E • Latitude- 29°28'18.279"N • Longitude- 80° 9'7.194"E • Latitude- 29°28'17.918"N • Longitude- 80° 9'4.205"E • Latitude- 29°28'18.013"N • Longitude- 80° 9'2.890"E • Latitude- 29°28'18.391"N • Longitude- 80° 9'2.039"E
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4.2 GENERAL

(a)	Mineral being worked	Sand, Boulder and Bajri
(b)	Period of mining Lease	Letter of Intent was granted for proposed mining upto five (5) years. LoI attached as Annexure I.
(c)	Category of land use	Revenue land (Non forest land)
(d)	Elevation Range of River Bed	512 to 515m

4.3 ABOUT PITHORAGARH DISTRICT-



Pithoragarh is the easternmost district of Uttarakhand, neighboring Tibet in the north and Nepal in the east. Pithoragarh is at [29.58°N 80.22°E](#). It has an average elevation of 1,514 [metres](#) (4,967 [feet](#)). It is situated in Soar Valley. The valley is spread across around 50 square kilometers. Pithoragarh is popularly known as the 'Little Kashmir'. Pithoragarh town is a historical landmark. It was a major center of power during the regime of the Chand Kings in Kumaon. It is the largest city in the hills of Uttarakhand. The city is strategically important from defense point of view for India as the district shares international boundaries with China and Nepal.

4.4 ACCESSIBILITY TO THE PROPOSED LEASE AREA- The lease area is situated in district Pithoragarh of Uttarakhand and is approachable through NH 125. The mine lease is connected to NH 125 through an metalled road of about 3 km. The nearest railway station is Tanakpur Railway station and is approachable at a distance of about 50 km.

NEAREST AVAILABLE FACILITIES

Nearest Post office	Ghat, about 4 km
Nearest PHC	Byashghat, about 1 km
Nearest CHC	Pithoragarh, about 30 km
Nearest Primary School	Jamradi Rantada, about 7 km
Nearest High School	Dakula, about 8 km
Nearest Intermediate	Dakula, about 8 km
Nearest Degree College & PG college	Pithoragarh, about 30 km
Nearest Panchayat ghar	Jamradi Rantada, about 7 km
Nearest Major market	Pithoragarh, about 30 km
Nearest distance from Upstream Bridge	about 4 km (Ghat Bridge)

4.5 ABOUT THE PROPOSED LEASE AREA- Letter of Intent (LoI) for RBM mining was granted via **1081/VII-1/2018/20kha/2018**, dated- **10 July 2018**, in the Village- Jamradi Rantada, Tehsil- Pithoragarh & District- Pithoragarh. Some of the facts/information about the proposed lease area is given as below:-

As per point no 13, Amendment of Rule 28 of Miner Mineral Policy, No. 1582/VII-1/2017/31kha/17, dated 31 October 2017; RQP is authorized to prepare & submit the



Mining Plan & after due process, approval authority is Director- Geology and Mining Unit, Department of Industries, Dehradun. (**RQP Certificate Attached as Ann.**)

Following important points, as per the above discussed Rule, must be incorporated in to the Mining Plan-

- 1 Quantity of minable mineral with reference to technically & environmentally safe method of mining (Discussed at Page No.19).
- 2 Description of DGPS coordinates of the proposed mining lease area must be given in the mining plan (Page No.7)
- 3 DGPS Coordinates must be superimposed in Geo referenced Khasara map (Cadastral) (Discussed at Annex. Survey Plate).
- 4 Description about the government land, private land, forest land etc within the proposed lease area shall be given & verified by the revenue department and copy of same shall be attached with the mining plan (Discussed at Annex.).

Sr. No	Khasra No.	Status of Land	Total Area (Ha.)	Area Utilized for Mining (Ha.)
1	8114	Revenue	0.038	-
2	8115	Revenue	0.009	-
	8212	Revenue	0.033	-
3	8228	Revenue	0.278	-
4	8229	Revenue	0.124	-
			0.482	0.444

- 5 Satellite map (scale 1:10000) of Public place, nearest bridges that fall in 100m circumference of lease area shall be mentioned (Discussed at Annex. Survey Plate).
- 6 Both bank of the river should be mentioned in satellite map, and marked mineable area clearly mentioned after leaving the specific distance from the river banks. Satellite map shall be attached with the mining plan (Discussed at Plate no.3).
- 7 All DGPS Pillar coordinates of the proposed Mining lease area shall be mentioned on map (in term of larger mining lease area the DGPS point coordinates shall be taken/given at ever 100m interval (Discussed at Annex. Geo referenced map).
- 8 Digital copy of all given the maps shall be given (Annx).

4.6 Georeferencing- means that the internal coordinate system of a map or aerial photo image can be related to a ground system of geographic coordinates. The relevant coordinate transforms are typically stored within the image file (GeoPDF and GeoTIFF are examples),



though there are many possible mechanisms for implementing georeferencing. The most visible effect of georeferencing is that display software can show ground coordinates (such as latitude/longitude or UTM coordinates) and also measure ground distances and areas. In other words, Georeferencing means to associate something with locations in physical space. The term is commonly used in the geographic information systems field to describe the process of associating a physical map or raster image of a map with spatial locations. Georeferencing may be applied to any kind of object or structure that can be related to a geographical location, such as points of interest, roads, places, bridges, or buildings.

Need

Georeferencing is crucial to making [aerial](#) and [satellite imagery](#), usually raster images, useful for mapping as it explains how other data, such as the above [GPS](#) points, relate to the imagery.

- Very essential information may be contained in data or images that were produced at a different point of time. It may be desired either to combine or compare this data with that currently available. The latter can be used to analyze the changes in the features under study over a period of time.
- Different maps may use different projection systems. Georeferencing tools contain methods to combine and overlay these maps with minimum distortion.
- Using georeferencing methods, data obtained from surveying tools like [total stations](#) may be given a point of reference from topographic maps already available.
- It may be required to establish the relationship between social [survey](#) results which have been coded with [postal codes](#) or street addresses and other geographic areas such as [census](#) zones or other areas used in public administration or service planning.

Methods-

There are various GIS tools available that can transform image data to some geographic control framework, like the commercial ArcMap, PCI Geomatica, TNTmips (MicroImages,Inc) or ERDAS Imagine. One can georeference a set of points, lines,



polygons, images, or 3D structures. For instance, a GPS device will record latitude and longitude coordinates for a given point of interest, effectively georeferencing this point. A georeference must be a unique identifier. In other words, there must be only one location for which a georeference acts as the reference.

Images may be encoded using special GIS file formats or be accompanied by a world file.

To georeference an image, one first needs to establish control points, input the known geographic coordinates of these control points, choose the coordinate system and other projection parameters and then minimize residuals. Residuals are the difference between the actual coordinates of the control points and the coordinates predicted by the geographic model created using the control points. They provide a method of determining the level of accuracy of the georeferencing process.

In situations where data has been collected and assigned to postal or area codes, it is usually necessary to convert these to geographic coordinates by use of a definitive directory or gazetteer file. Such gazetteers are often produced by census agencies, national mapping organizations or postal service providers. At their simplest, these may simply comprise a list of area codes or place names and another list of corresponding codes, names or coordinate locations. The range and purpose of the codes available is country-specific. An example is the UK's National Statistics Postcode Directory which shows each postcode's membership of census, administrative, electoral and other geographical areas. In this case, the directory also provides dates of creation and deletion, address counts and an Ordnance Survey grid reference for each postcode, allowing it to be mapped directly. Such gazetteer files support many web-based mapping systems which will place a symbol on a map or undertaken analysis such as route-finding, on the basis of postal codes, addresses or place names input by the user.

Cadastral Maps- Cadastre is a technical term for a set of records showing the extent, value and ownership (or other basis for use or occupancy) of land. Strictly speaking, a cadastre is a record of areas and values of land and of landholders that originally was compiled for purposes of taxation. In many countries there is, however, no longer any land tax and in practice the cadastre serves two other equally important purposes. It provides a ready means of precise description and identification of particular pieces of land and it acts as a continuous record of rights in land.



A modern cadastre normally consists of a series of large-scale maps or plans, and corresponding registers. Both the plans and the registers may be stored in computers, as discussed in the chapter “computerization of maps and registers”. The present chapter deals with the essential features of cadastral maps with particular reference to the form they take when drawn on paper or displayed on a computer screen. While the survey of an individual parcel of land has in some countries resulted in a “cadastral map” for that plot of land and may have been unconnected to any adjoining land parcels, the true cadastral map covers all parcels within an area rather than isolated plots. It can act as an index for other land parcel surveys that show more detailed information or can be of sufficiently large scale for the dimensions of each plot to be obtainable from the map. In this chapter, and throughout this monograph, the term ‘cadastral map’ will be associated with any parcel of land whether defined by ownership, value or use provided that the parcel has an independent identity and is relevant to the management of land as a resource. A cadastral map will show the boundaries of such parcels but may in addition incorporate details of the resources associated with them, including the physical structures on or beneath them, their geology, soils, and vegetation and the manner in which the land is used.

The scale of cadastral maps is of great importance. Since the object of the map is to provide a precise description and identification of the land, the scale must be large enough for every separate plot of land which may be the subject of separate possession (conveniently called a “survey plot” or “land parcel”) to appear as a recognizable unit on the map. When map data are stored in a computer, they may be drawn at almost any scale and this can give an impression of greater accuracy than the quality of the survey data may warrant.

Differential Global Positioning Systems (DGPS) are enhancements to the Global Positioning System (GPS) which provide improved location accuracy, in the range of operations of each system, from the 15-meter nominal GPS accuracy to about 10 cm in case of the best implementations. Each DGPS uses a network of fixed ground-based reference stations to broadcast the difference between the positions indicated by the GPS satellite system and known fixed positions. These stations broadcast the difference between the measured satellite pseudoranges and actual (internally computed) pseudoranges, and receiver stations may correct their pseudoranges by the same amount. The digital correction signal is typically broadcast locally over ground-based transmitters of shorter range.



CHAPTER-5

5.1 GEOLOGY & EXPLORATION

5.1 GEOLOGY

The proposed mining area belongs to Lesser Himalayan zone bounded by MCT in the north and by North Almora Thrust in the south. The Lesser Himalaya consists of the sediments of the Precambrian Palaeozoic and locally Mesozoic age, metamorphosed and subdivided by the thrusts with progressively older rocks towards the north. The Pithoragarh region has the exposures of an extensive sedimentary belt including an outer Krol belt and an inner Tejam-Pithoragarh belt. It consists of a thick sequence of argillo-calcareous and arenaceous sediments constituting the Garhwal super group. The Garhwal super group is divisible into three Groups i.e. the lower argillo-calcareous Tejam Group, middle predominantly arenaceous Berinag Group and the upper metamorphites of the Didihat Group.

Stratigraphy as Follows (after KS Valdia)-

Berinag Quartzite

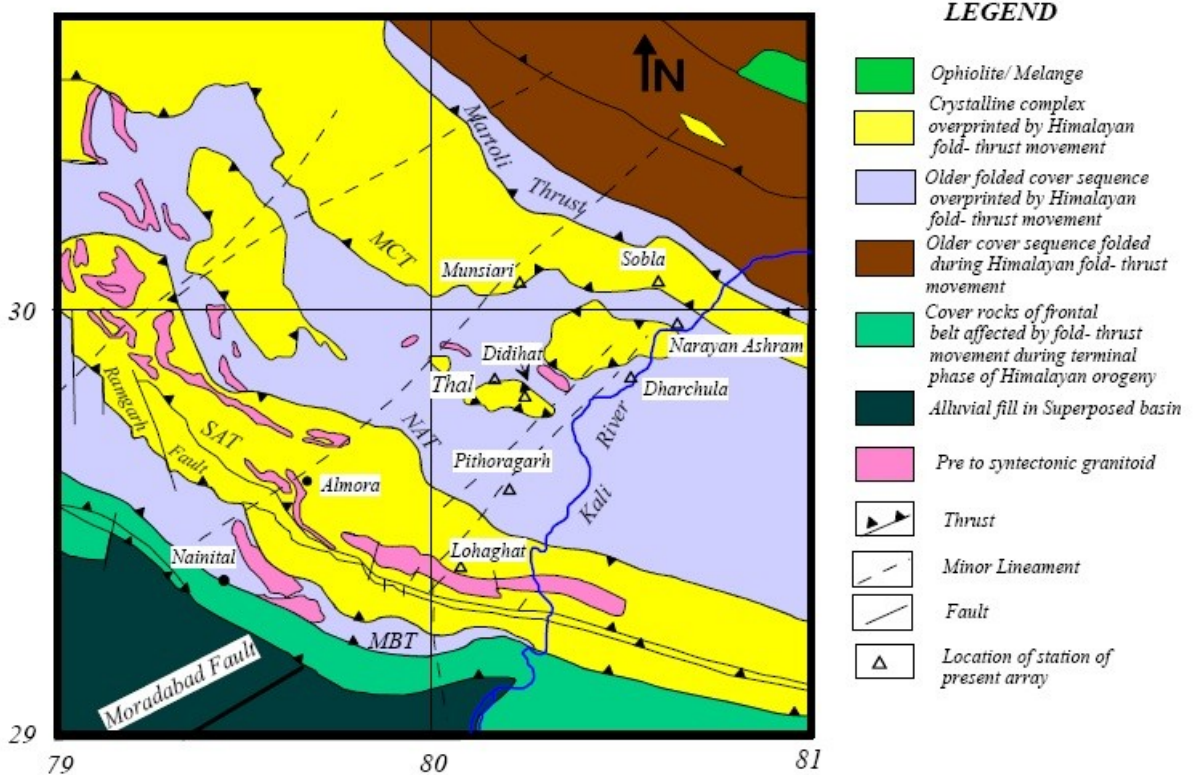
.....Unconformity.....

Devban/Gangilhat Formation, lithologically major as Dolomite, Dolomitic limestone, Limestone, Magnesite etc

Sor Slates, lithologically major as Shale, Slate, Phyllites



Proposed mining area belongs to Terrace Deposit, Regionally belongs to Lesser Himalayan Zone.



GEOLOGY MAP OF DIST. PITHORAGARH

5.2 EXPLORATION

Adequate amount of sand, bajri and boulder in reserve is available for meeting consumer demand. Moreover mining will be carried out by batch rotation manner and the mined out area is annually replenishable.

5.3 ESTIMATION OF RESERVE

The method of cross section has been adopted for computing the reserve. The mining lease boundary, proven and mining limits are marked on the plan which is thereafter transferred to cross section for determining the different categories of reserve.

The geological reserves have been estimated as per UNFC in all the three axis is as below

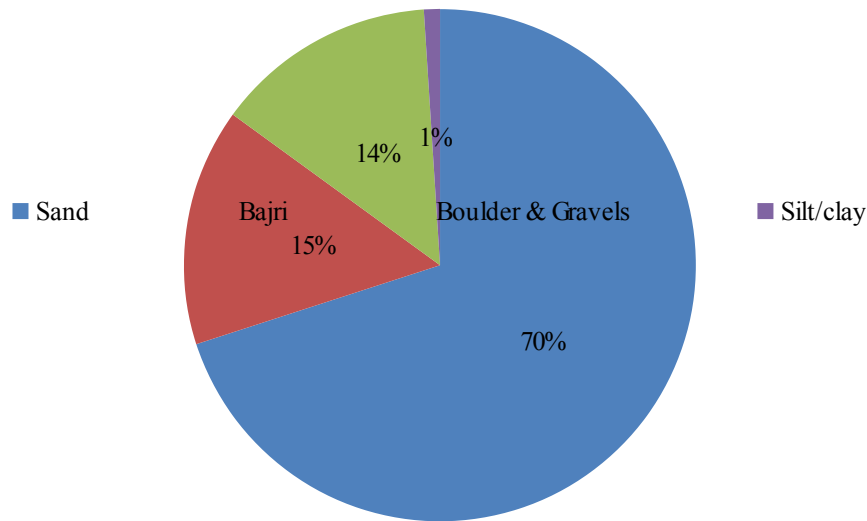
- a) **Economic Axis (E-1):** The RBM is exists within the entire stretch & having no problem selling in the market. The road is near the less area & RBM shall be loaded into tipper with the deployment of an excavator & transport to crusher. On the feasibility study, economics viability of deposit has been established & RBM in economic viable, therefore economic axis has been considered as E-1.
- b) **Feasibility Status (F-1):** Feasibility study has been carried out & is considered to be feasibility status. A feasibility study provides a preliminary assessment with a level of confidence as compared to that of feasibility study. It has been revealed that exploitation of RBM is feasible & Economic viable & feasibility axis under UNFC code has been considered as F-1.
- c) **Geological Axis:** The exposure of RBM is seen in the entire stretch & thickness of RBM varies 2.5m to 3.0m. Therefore geological axis has been considered as G-1. In order to calculate the mineable reserve the geological map on the 1:1000 scale was prepared and main litho units were marked on the plan to know the surface spread of each unit. The different constituents of the deposits such as sand, bajri, boulder and mixture of clay, soil, silt, based on sized classification were considered for the reserve calculation. Although it is not possible to mark these units separately on the geological map, as such three pits of 1x1x1 meters were got dug in the mineable lease area and material so excavated was separated into different size and their percentage was worked out. This percentage was taken into account during calculation of the reserve. The cumulative result of the test pits are given in the following Table no 1.

Table No. 1. Classification of Mineral Constituents available

Sr. No.	Mineral	Size	Percentage
1.	Sand	0.06-2 mm	70%
2.	Bajri	8-64 mm	15%
3.	Boulder & Gravels	256 mm<	14%
4.	Silt/Clay	1-62.5 μ m	1%



Percentage



PIE GRAPH OF % OF MINERAL CONSTITUENTS

Bulk density is taken as 2.2 for calculation (as per Go UK, Industrial Development Section Notification 1033/VII-1/ 2015/ 146– Kha/ 2010, dated 31st July 2015). Calculation of reserve has been done as following:

- 1 Cross sections have been prepared at intervals. Refer Plate No.5
- 2 Area of every cross section has been taken. For example, if the area of cross section A-A' is 'X' and area of B-B' is 'Y', then average of both calculating the reserve (i.e. $(X+Y)/2$).
- 3 Distance between the two sections has been multiplied with the average area of the two sections to get the total volume. Eg. $[(X+Y)/2] \times$ Distance between A-A' & B-B'.

The overall geological reserves have been estimated through geological cross section method. The area of each section line is calculated. The section area is multiplied by the strike influence to get the volume. The target geological reserve classified in to three categories i.e. Proved reserve, Probable reserve & possible reserve. In this project the proved reserve assessed as 3m depth & further 2m as probable reserve whereas 1m considered as possible reserve. Out of total volume the 90% considered as the recoverable reserve & 2.2 bulk density.

Table No. 2. Reserve Estimation (Proved Reserve)

Cross-Section Line	Sectional Area (m²)	Strike influence (m)	Volume (m³)	Quantity (MT)
1-1'	108	30	3240	6415
2-2'	138	40	5520	10929
3-3'	120	35	4200	8316
Total			12960	25660

Table No. 3. Reserve Estimation (Probable Reserve)

Cross-Section Line	Sectional Area (m²)	Strike influence (m)	Volume (m³)	Quantity (MT)
1-1'	72	30	2160	4276
2-2'	92	40	3680	7286
3-3'	80	35	2800	5544
Total			8640	17106

Table No. 4. Reserve Estimation (Possible Reserve)

Cross-Section Line	Sectional Area (m²)	Strike influence (m)	Volume (m³)	Quantity (MT)
1-1'	36	30	1080	2138
2-2'	46	40	1840	3643
3-3'	40	35	1400	2772
Total	-		4320	8553

5.3.1 Geological Reserves: The summarized category-wise geological reserve estimated by is:-

Table No. - 5.

Mineral Reserve	Code	Quantity of RBM in (m³)	Quantity of RBM in Tons



Proved Reserve	111	40200	79596
Probable Reserve	122	26800	54432
Possible Reserve	133	13200	26136

5.3.2 Mineable Reserve: - The mineable reserve is calculated as referred in **Notification No.1582/VIII/2017/31kha/17, dated 31 October 2017** under Uttarakhand Minor Mineral Rules (Revised) 2017.

- Total Area= 0.482= 4820 M²
- Proposed mine working shall be confined up to 1.5m bgl or above the ground water table, whichever is less.

5.4 MINE REPLENISHMENT

It has been assessed that proposed mining area/ mineral picking area generally gets flooded during monsoon season and gets completely replenished. However, The Department of Geology & Mining may monitor the replenishment within the lease area and specific consultation or study may be conducted whenever required.

CHAPTER-6

6.1 MINING



6.1.1 METHOD OF WORKING- Taking into consideration the matrix of deposit in the river bed and the targeted production, the mine will be worked by fully manual opencast method for collection of Minor Minerals (Sand, Bajri & Boulders) from River - Saryu (ML Area 0.482 Hectare) at Village –Jamradi Rantada, Tehsil- Pithoragarh, District- Pithoragarh, Uttarakhand. The project does not involve any processes such as overburden removal, drilling, blasting and beneficiation. The proposed mining method is conventional opencast river bed mining primarily involves scooping the mineral through use of implements like spade, pick axe and shovel etc. and requires no drilling & blasting. Proposed mining will be started from higher levels to lower levels through phase wise/ block wise, going to the maximum depth of 1.5m below ground levels (bgl) or above ground water level whichever is less. Length of the block may be decided on the spot convenience. The loading of mineral shall be done manually and transported by truck/tipper to the storage points located outside the mining lease. The project proponent engages local labours available from the concerned revenue villages. The implements for mining are arranged by project proponent who are also responsible for administrative control of labours as well as for carrying out mining operations in the sanctioned / demarcated lease area within the ambit of the conditions set forth in the order for execution of mine by the competent authority and also the instructions / guideline issued by the Khanan Vibhag, Uttarakhand. Total lease area is workable and replenishable yearly. After each workable year, a longitudinal wall of about 1m be may be raised and repaired thereafter, as required, on the river bank side to check toe erosion, an environment hazardous phenomenon may be induced by the heavy floods during monsoon season. Mineral extraction will be done for a period of 240 days in a year; during monsoon period mining activity will be strictly banned.

6.2 SURVEY INSTRUMENT SPECIFICATION-

6.2.1 Drone Survey- Drone survey of the proposed area & outer neighboring regions been done by Himalayan Surveying Services Pvt. Ltd. as per specifications discussed.

6.2.2 DGPS Survey- DGPS survey of the pillar coordinates of the proposed area been done by Himalayan Surveying Services Pvt. as per specifications discussed.

Following guidelines will be followed while carrying out mining:

- 1 Uttarakhand State Minor Mineral Mining Policy and amendments.



- 2 The Uttarakhand Minor Mineral (Sand, Bajri, Boulder etc.) Policy 2017
- 3 All other guidelines & Circulars, related to RBM mining/ Gazettes of the Ministry of Environment & Forests.

6.3 EXTENT OF MECHANIZATION

No mechanization is required as the operation will be manual method without drilling or blasting.

6.4 MODE OF WORKING

For the optimum utilization of the mineral available in the lease area, mine working has been planned and scientific layout has been designed considering the following parameters:

- The proposed minor mineral extraction area is jointly visited by various district level department officers and boundary pillars been demarcated and informed to applicant.
- The approach road will be repaired from time to time.
- The quarry planning is done in simple rotational manner, since deposit is very simple, shallow and beds are horizontal.
- Simultaneous plantation will also be done along the lease boundary

ABOUT THE RESERVE-

The proved ultimate mineable reserve from the area is 14, 652 tonnes/year. Other aspects as discussed below-

- Total Area= 0.482 Ha.= 4820 M²
- Deposit/reserve at 1.5m Depth= 7230 M³
- Non Mineable Area = 0.038 Ha.
- Mineable area after leaving the Non Mineable Area= 0.444 Ha.
- As per Uttarakhand Minor Mineral Policy 2017, Quantity of ultimate reserve (tonnes) = Mineable Area (0.444 ha.) x 1.5 m depth x 2.2 bulk density= 14652 tonnes/year
- As per the data collected during the field test/survey, the quantity of minor mineral (production quantity) i.e. 9009 tonnes, is 61% of the material available i.e. 14652 tonnes (total material available up to maximum allowable depth); rest 39% of



material available is planned as residue/waste material, (accordingly planned & backfilled).

- Maximum extractable (sustainable extraction) quantity of mineral recommended by district level committee duly authorized by Minor Mineral Policy 2016 = 9009 tonnes/year.
- Based on above facts and figure, the saleable mineral i.e. 9009 tonnes/year, is a sustainable extractable quantity for this project (final saleable figure from the proposed lease).

6.5 YEARWISE DEVELOPMENT & PRODUCTION

TABLE NO. 6. - YEARWISE PRODUCTION

YEAR	MINEABLE AREA	DEPTH (M)	ULTIMATE MINABLE RESERVE (tonnes/year)	PRODUCTION (Saleable Quantity of RBM) (tonnes/year)
FIRST YEAR	4440 m ²	1.5	14652	9009
SECOND YEAR	4440 m ²	1.5	14652	9009
THIRD YEAR	4440 m ²	1.5	14652	9009
FOURTH YEAR	4440 m ²	1.5	14652	9009
FIFTH YEAR	4440 m ²	1.5	14652	9009
TOTAL	-	-	73260 Tonnes	45045 Tonnes

6.6 ABOUT THE SALEABLE PRODUCTION-



6.6.1 DEVELOPMENT & PRODUCTION FOR FIRST YEAR - For year 1st year the Development & Production Programme, the mining is proposed 4440 sqm area. The saleable production of each mineral constituent would be on an average as under:-

**Table No. 7- PRODUCTION IN FIRST YEAR
BENCH LEVEL FROM 512 M TO 515 M**

Sr. No.	Mineral Constituents	Production ($\approx\pm$) in tons
1.	Sand (75%)	6756.75
2.	Bajri (15%)	1351.35
3.	Boulder (10%)	900.9
	TOTAL	9009 TONNES

6. DEVELOPMENT & PRODUCTION FOR YEAR SECOND YEAR - For 2nd year the Development & Production Programme, the mining is proposed in 4440 sqm area. The saleable production of each mineral constituent would be on an average as under:-

**Table No. 8- PRODUCTION IN SECOND YEAR
BENCH LEVEL FROM 512 M TO 515 M**

Sr. No.	Mineral Constituents	Production ($\approx\pm$) in tons
1.	Sand (75%)	6756.75
2.	Bajri (15%)	1351.35
3.	Boulder (10%)	900.9
	TOTAL	9009 TONNES



6.7 DEVELOPMENT & PRODUCTION FOR YEAR THIRD YEAR - For year 3rd year the Development & Production Programme, the mining is proposed in 4440 sqm area. The saleable production of each mineral constituent would be on an average as under:-

**Table No. 9- PRODUCTION IN THIRD YEAR
BENCH LEVEL FROM 512 M TO 515 M**

Sr. No.	Mineral Constituents	Production ($\approx\pm$) in tons
1.	Sand (75%)	6756.75
2.	Bajri (15%)	1351.35
3.	Boulder (10%)	900.9
	TOTAL	9009
		TONNES

6.8 DEVELOPMENT & PRODUCTION FOR YEAR FOURTH YEAR - For year 4th year the Development & Production Programme, the mining is proposed in 4440 sqm area. The saleable production of each mineral constituent would be on an average as under:-

**Table No. 10- PRODUCTION IN FOURTH YEAR
BENCH LEVEL FROM 512 M TO 515 M**

Sr. No.	Mineral Constituents	Production ($\approx\pm$) in tons
1.	Sand (75%)	6756.75
2.	Bajri (15%)	1351.35
3.	Boulder (10%)	900.9
	TOTAL	9009
		TONNES



6.9 DEVELOPMENT & PRODUCTION FOR YEAR FIFTH YEAR - For 5th year the Development & Production Programme, the mining is proposed in 4440 sqm area. The saleable production of each mineral constituent would be on an average as under:-

**Table No. 11- PRODUCTION IN FIFTH YEAR
BENCH LEVEL FROM 512 M TO 515 M**

Sr. No.	Mineral Constituents	Production ($\approx\pm$) in tons
1.	Sand (75%)	6756.75
2.	Bajri (15%)	1351.35
3.	Boulder (10%)	900.9
	TOTAL	9009
		TONNES

6.10 MINERAL PRODUCTION

The riverbed mining will consist of sand and their production may vary to a great extent depending upon availability. Therefore quantity of sand cannot be estimated on logical parameters, the figures given here above only tentative. The production target is as above.

6.11 DEVELOPMENT AND PRODUCTION PROGRAMME FOR FIVE YEARS.

Prior to start production from the area, some development work has to be completed as under Plate No.5-9.

- Haul road preparation.
- Erection of a temporary site office and two rest shelter.
- Barbed wire fencing all around the mining/applied area may be provided to avoid accident and inadvertent entry.
- Retaining wall will be raised towards the valley side (river bank) to abstain from toe erosion.

CHAPTER-7

7.0 DRILLING & BLASTING



No drilling and blasting is proposed to be done to undertake mining of riverbed minerals.

CHAPTER-8

8.0 WATER AND DRAINAGE SYSTEM

As per the proposed mining the working shall be confined up to 1.5m bgl or above the ground water table Mining in the area will be done well above the water table as well as river bed water level therefore impact on water regime is not anticipated. Hence no water clogging is likely to be encountered. Therefore, there is no need of any such arrangements.

CHAPTER-9

9.1 DISPOSAL OF WASTE MATERIAL

Exact quantitative calculation about reserve/saleable production/waste generated in RBM mining project is not possible but logical classification/assessment may be considered. As per the logical assessment of the production of mining lease, the Ultimate Mineable Reserve in this project is 14652 tonnes/year, of which about 61% is considered/ assessed as saleable production for proposed mining lease i.e. 9009 tonnes/year and about 39% of total material has been considered as waste material, it includes wastage during transportation and unused/ low value material like silt/clay etc. No waste other than negligible quantity of silt/silty clay, which gets deposited as crust material on the bed profile, shall be scrapped and carefully stored for depositing into the mine pits in the river bed or in the upper terraces earmarked for plantation purpose.

9.1.1 Sewerage System:

For disposal of sewage Ecofriendly mobile Toilets will be provided.

9.1.2 Solid Waste Management:

As per the logical assessment of the production of mining lease, the Ultimate Mineable Reserve in this project is 14652 tonnes/year, of which 61% is considered/ assessed as saleable production for proposed mining lease i.e. 9009 tonnes/year and 39% of total material has been considered as waste material, it includes wastage during transportation and unused/ low value material like silt/clay etc which gets deposited as crust material on the bed profile, shall be scrapped and carefully stored for depositing into the mine pits in



the river bed or in the upper terraces earmarked for plantation purpose. It would be in fitness of things to repeat that there will be no solid waste generated in the proposed activity (other than mining waste).

CHAPTER-10

10.1 USE OF MINERALS

Sand, bajri and boulders are used in construction activities like building, roads, bridges etc. The requirement for the mineral is always high in the nearby cities and towns.

CHAPTER-11

11.1 OTHERS

11.1 HAULAGE AND SURFACE TRANSPORT

Mode of transportation of material is by trucks/tractors, of size of 10 tonnes capacity have been planned. The mine road is adequate to permit easy maneuverability of trucks allowing cross over and changing points. Water will be sprayed two times a day by tractor mounted sprinklers until dust remains airborne.

11.2 MINE MACHINERY

Mining will be done by manually open cast method using hand tools like shovel, spades, and pick-axes. Other machineries on the mining site will be water sprinkler.

11.3 SITE SERVICES

Temporary rest Shelter: A temporary rest shelter will be provided for the workers near the site for rest

First aid box: First aid box along with anti-venoms to counteract poison by certain species of small insects, if any

Sanitation facility: Facilities such as septic tank or community toilet will be provided for workers



11.4 WATER REQUIREMENT

Water Supply Water requirement for the proposed project will be provided for the workers for drinking & domestic purpose. Water will also be provided for dust suppression. Fresh water will be only used for drinking purpose. The water will be supplied from available sources from nearby village. The break up for water requirement is given below:

Table No. 12. Water Requirement

S. No.	Purpose	Water Requirement (KLD)
1.	Dust Suppression	2.0
2.	Drinking	1.0
3.	Miscellaneous (Plantation etc)	0.7
Total		3.7 KLD

11.5 EMPLOYMENT

The manpower requirement for the proposed project is given below along with the breakup, who will be utilized for excavation & loading of minerals into trucks. The break up for employment is as under:

Table No. 13 Employment Break-up

S.No.	Category	Numbers
1.	Mining Competent Person	1
2.	Administrative	1
3.	Supervisor	1
4.	Unskilled	18
	Total	21

11.6 SAFETY PROVISION

All provision in safety rules & regulation will be maintained by providing required materials to the employees. The lessee will provide safety shoes, safety helmets to all the employees. There will be no violation of safety provision.

CHAPTER-12

12.0 MINERAL BENEFICIATION

Mineral Sand, Bajari & Boulders doesn't require processing or beneficiation.



CHAPTER-13

13.0 ENVIRONMENT MANAGEMENT PLAN

13.1 INTRODUCTION

Mining, Environment and development have become complimentary to each other. EMP identifies the extent of the environmental, social and economic impacts of a project prior to mining of mineral and systematically examines both beneficial and adverse impacts of the proposed project over and above the prevailing conditions of environmental parameters and ensure that these impacts are taken into account during the project designing stage itself and the values of the combined impacts are never allowed to exceed and remain within the statutory norms. The EMP has been prepared with a view to ultimately ensure the adverse impacts are minimized if these cannot be prevented altogether.

13.2 SOLID WASTE MANAGEMENT

As per the logical assessment of the production of mining lease, the Ultimate Mineable Reserve in this project is 14652 tonnes/year, of which 61% is considered/ assessed as saleable production for proposed mining lease i.e. 9009 tonnes/year and 39% of total material has been considered as waste material, it includes wastage during transportation and unused/ low value material like silt/clay etc which gets deposited as crust material on the bed profile, shall be scrapped and carefully stored for depositing into the mine pits in the river bed or in the upper terraces earmarked for plantation purpose. It would be in fitness of things to repeat that there will be no solid waste generated in the proposed activity (other than mining waste).

13.1.1 Sewerage system:

There will no waste water generation from mining activity. However if there is any generation it shall be disposed through eco-friendly Mobile Toilets.



13.2 PLANTATION

There is no soil over mineralized area however the receding floods in the monsoon season deposit some clay /soil carried down by river water. It is hardly a few millimeter thick and of not much consequence. Even in the areas of no mining activity the process of deposition in one season and transportation of previously deposited material in the next season takes place along with deposition of fresh material by receding floods. Soil Quality will be monitored on yearly basis in the area surrounding the core zone used for agricultural activity to check for any negative impacts on the soil quality. Plantation activity shall be undertaken in consultation with village panchayat at the river banks, village roadside or Panchayat waste lands to improve the land quality, aesthetics and reduce soil erosion. Every year 25 to 30 trees will be planted.

13.3 BASELINE INFORMATION

13.3.1 Land Use Pattern

Entire lease area is a wasteland & barren, scattered seasonal bushes & shrubs cover this area. Sandy soil forms a thin cover over the silica sand. There is no agricultural land most of the land is barren. There is no existing infrastructure, however during mining temporary rest shelters for workers will be provided.

13.3.2 Flora & Fauna

District possesses a great range of elevation there is a remarkable diversity in its natural vegetation. In addition climatic variations, particularly in temperature and precipitation associated with the alignment and altitudes of ranges and nature of valleys, determine the altitudinal growth and variety of vegetation. The northern hilly zone is covered with dense forests, particularly on northern slopes, with the diverse flora up to an elevation of about 14,000 ft. The entire zone is rich in a remarkable variety of birds possessing plumage of magnificent design and colors like Peacock, which include Grey Quail, Kala Titar, Whistling Thrush, Chakor, Monal Pheasant, Cheer Pheasant, Koklas Pheasant etc.



13.3.2 Climatic Condition

Pithoragarh town, being in a valley, is relatively warm during summer and cool during winter. During the coldest months of December and January, the tropical and temperate mountain ridges and high locations receive snowfall and have an average temperature of 5.5– 8.0 °C (41.9–46.4 °F). Pithoragarh district has extreme variation in temperature due to the large variations in altitude. The temperature rises from mid-March through mid-June. The areas above 3,500 metres (11,500 ft) remain in a permanent snow cover. Regions lying at 3,000–3,500 metres (9,800–11,500 ft) become snow bound for four to six months. At places like the river gorges at Dharchula, Jhulaghat, Ghat and Sera, temperatures reach 40 °C (104°F) The annual average rainfall of Pithoragarh district is 36.7 centimeters.

13.3.4 Social Infrastructure

The nearest health education facility is available in Village- Jamradi Rantada, about 1.5 km from site. Other major facilities are available in Pithoragarh (14 km Aerially).

13.4 EFFECT OF MINING ON ENVIRONMENT

Mining will affect following aspects.

13.4.1 Land Environment

The proposed project is on the river bed of Saryu. 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

13.4.2 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.

13.4.3 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, Bajri & 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.

13.4.4 Water Environment

Mining of sand, stone and bajri 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 Saryu.
- 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, Bajri & boulders from river bed.



13.4.5 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.

13.5 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 dBA
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CHAPTER-14

14.0 MINE CLOSURE PLAN

14.1 INTRODUCTION:- The Letter of Intent (LoI) was granted vide GO No. **1081 /VII-1/2018/20kha/2018, dated 10 July 2018**, to Sh. Abhishek Rawat S/o Sh. Sham Singh Rawat R/o- Dharchula Road, Siltham District-Pithoragarh, Uttarakhand as per **Uttarakhand Notification No.1582/VII-1/2017/31kha/17, dated 31 October 2017** under Uttarakhand Minor Mineral Rules (Revised) 2017, for extraction of Sand Bajri and Boulder through E-tender/E-auction floated by Geology & Mining Unit, Department of Industries, invitation letter No. 05_Pithoragarh_Jamradi Rantada_0.482 ha /e.niwi.shahe nila /Bhu.khani.e./ 2017-2018 Dated-07 February 2018 & amended advertisement no.05_Pithoragarh_Jamradi Rantada _0.482/bhu.khani.e./e.niwi.sah e.nila./2017-18, dated 23 February 2018, under minor mineral policy 2017, rule no. 27Ga. (second stage) sub rule 5, declared as H1 (highest auction value), in a part of Village- Jamradi Rantada, Khasara No. 8114, 8115, 8228, 8212, 8229, Area- 0.482 Hectare. Proposed SAND, BAJRI AND BOULDERS MINE, in Village- Jamradi Rantada, Tehsil- Pithoragarh, District- Pithoragarh Uttarakhand, Applicant Sh. Abhishek Rawat S/o sh. Sham Singh Rawat is a very small 'B2' category mine as per explanation furnished in MCDR, 1988 i.e. manual



opencast mines not using explosives. Mine Plan for this project under revised guidelines discussed here in this Report.

14.1.1 GENERAL

1.1	Name of the applicant	Shri Abhishek Rawat S/o Sh Sham Singh Rawat
	Address	R/o- Dharchula Road, Siltham
	District	Pithoragarh
	State	Uttarakhand
	Pin Code	-
	Phone	
1.2	Status of the applicant	Private Individual
1.3	Mineral(s) which the applicant intends to mine	Sand, Bajri and Boulder. The mineral collected/extracted from the lease area shall be sold in the open market as per the demand.
1.4	Period for which the mining lease is required or granted / renewed	State Government has released the Letter of Intent (LoI) for the project vides GO No. 1081/VII-1/2018/20Kha/2018, dated 10 July 2018 , Area 0.482 Ha. (LoI G.O. attached as Annexure I)
1.5	Name of the RQP preparing the mining plan	Bhuwan Joshi



	Address	C/o B.S. Rawat Kamal Bhawan House No. 6 Vijay Colony Lane No. 1 New Cantt Road, Dehradun (Uttarakhand) 248001
	Phone	+919412152105
	Fax	
	Registration No.	RQP/DDN/180/2009/A
	Valid upto	30/08/2019
1.6	Name of the prospecting agency	The baseline data is collected from various reports of the Mine, proponent, as well as detailed prospecting of the area is carried out by the RQP

14.3 LAND USE PATTERN OF THE AREA:-

Sr. No.	Land Use (Ha.)	Agriculture Land (Ha.)	Forest Land (Ha.)	Waste Land (Ha.)	Grazing Land (Ha.)



1	Mining pits quarry	-	-	-	-
2	Approach Road	-	-	-	-
3	Dumps	-	-	-	-
4	Office, rest shelter etc	-	-	-	-
5	Balance undistributed land	-	-	0.482 Ha.	-
	Total	-	-	0.482 Ha.	-

14.4 METHOD OF MINING:-

- 1 The mining/ collection of minerals shall involve shoveling by simple hand tool and loading into trucks/ tractors- trailers for transporting them to crusher site.
- 2 Picking and extraction of minor minerals/trenches and pits for the mining purpose shall be made in such a way that this should not be more than 1.5 meters.
- 3 With the replenishment of the pits and trenches during the high floods, the process of the controlled mining can continue year after year.
- 4 Though the major mining activities will be under taken during the dry seasons but restrained mining can be under taken during the dry days of rainy season.

14.7 NAME & ADDRESS OF THE RECOGNIZED PERSON:-

BHUWAN JOSHI
C/o B.S. Rawat
Kamal Bhawan
House No. 6
Vijay Colony
Lane No. 1
New Cantt Road,
Dehradun (Uttarakhand) 248001

14.8 MINE DESCRIPTION:-



Picking /extractions of minor minerals (sand, bajari & boulders), detail already discussed in previous paragraphs

14.9 GEOLOGY:-

The proposed mining area belongs to Lesser Himalayan zone bounded by MCT in the north and by North Almora Thrust in the south. The Lesser Himalaya consists of the sediments of the Precambrian Palaeozoic and locally Mesozoic age, metamorphosed and subdivided by the thrusts with progressively older rocks towards the north. The Pithoragarh region has the exposures of an extensive sedimentary belt including an outer Krol belt and an inner Tejam-Pithoragarh belt. It consists of a thick sequence of argillo-calcareous and arenaceous sediments constituting the Garhwal super group. The Garhwal super group is divisible into three Groups i.e. the lower argillo-calcareous Tejam Group, middle predominantly arenaceous Berinag Group and the upper metamorphites of the Didihat Group.

Stratigraphy as Follows (after KS Valdia)-

Berinag Quartzite

.....Unconformity.....

Devban/Gangilhat Formation, lithologically major as Dolomite, Dolomitic limestone, Limestone, Magnesite etc

Sor Slates, lithologically major as Shale, Slate, Phyllites

Proposed mining area belongs to Terrace Deposit, Regionally belongs to Lesser Himalayan Zone.

14.10 RESERVES:-

The lease area falls in to outer part of river bed possess river borne material as sand, bajari, boulders, cobbles, pebbles, with little mixed clay, generated through erosional & depositional activity from upper horizons. The already existing quantity at the river bed in the lease area due to fresh depositions has been considered to be the quantum of mineral available (Reserve) which may be mined out. In order to calculate this quantity, the lease area has been considered with an ultimate depth of 1.5 meter from the surface. The reserve



for the site has been estimated to 14652 tonnes. Exact quantitative calculation about reserve /saleable production/waste generated in RBM mining project is not possible but logical classification/assessment may be considered so within Ultimate Mineable Reserve in this project i.e. 14652 tonnes/year, of 61% is considered/ assessed as saleable production for proposed mining lease i.e. 9009 tonnes/year and 39% of total material has been considered as waste material, it includes wastage during transportation and unused/ low value material like silt/clay etc.

Detail about geological reserve already discussed in Chapter No. 5.

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14.11 PROGRESSIVE CLOSURE PLAN

- a)** The proposed mining lease area belongs to river borne deposit (RBM) deposited by Saryu River, mostly during rainy season. The mining process is conventionally opencast river bed mining of minor minerals with hand tools, shovels and pan without drilling & blasting. Proposed mining will be started from higher levels to lower levels through phase wise/ block wise, going to the maximum depth of 1.5m below ground levels (bgl) or above ground water level whichever is less. Length of the block may be decided on the spot convenience. Total lease area is workable and replenishable yearly. After each workable year, a longitudinal wall of about 1m be may be raised and repaired thereafter, as required, on the river bank side to check toe erosion, an environment hazardous phenomenon may be induced by the heavy floods during monsoon season. Mineral extraction will be done for a period of 240 days in a year; during monsoon period mining activity will be strictly banned.
- b)** On an average about 2 to 3 meters river deposit thickness assessed from the proposed lease area, most possibly due to excess in the core zone of the channel the boulders are spread outer both sides of the river/channel within nearby civil land, proper channelization is essentially required for hazard safety point of view. During the monsoon rainy season 1.5 to 2m average stocking of sand, bajari & boulders assessed. So it is clear that the deposit would be annually replenishing as such no



need to develop or plan for closure scheme but towards valley side temporarily construction of longitudinal wall is suggested to reduce the impacts of toe erosion.

c) Mining:

Mining will be done as per the guidelines of Uttarakhand Mineral Policy, 2011 and guidelines of Uttarakhand Minor Mineral Concession Rules, 2001.

Sl. No.	Activities	Area (Ha.)
1-	Area already broken up	-
2-	Area already backfilled/reclaimed	-

	Activities	Area
1-	Additional Area proposed to be broken up per year	4440 m ²
2-	Additional Area proposed to be replenished with flood water	4440 m ²

d) Dump:

No waste dump is created therefore the question of failure of waste dump does not exist

Sl. No.	Activities	Area (Ha.)
1-	Area already covered by dump	Nil
2-	Additional Area to be covered by soil stack	-
3-	Additional area to be covered by interburden dump	Nil
4-	Dump area to be covered by protective measures	-

e) Plantation:



In the river bed area/lease area the plantation is not possible however in the outer bank area & in the village panchayat land the plantation is proposed with consultation of mining officer and district/local administration. Trees will be planted along roadsides, to arrest auto exhaust and noise pollution, and in such a way that there is no direct line of sight to the working site when viewed from a point outside the foliage perimeter. Fast growing trees with thick perennial foliage will be grown, as it will take many years for other trees to grow to their full height. For revegetation, the plants and saplings suitable for the existing soils and site condition may consider and those plants are recommended which can adapt to the local climate.

Sl. No.	Activities	Area
1-	Area already covered under plantation	-
2-	Area proposed to be cover under plantation & protection work	445 m ²
	Total	445 m ²

14.12 AIR QUALITY MANAGEMENT

The major contribution of air pollution is by river bed mining, such as excavation, loading, transportation, hauling operation and handling of mineral viz. Sand, Bajri & Boulders. This will increase the level of particulate matter in the environment i.e. PM10 (3.03 µg/m³) at a distance of 500 meters near Kaccha Road. 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. Periodic air quality monitoring will be carried out to assess the quality and for timely corrective actions. Proper mitigation measures like water



sprinkling will be adopted to control dust emissions. Plantation will be carried out on approach roads & nearby vicinity of river bank.

14.13 WASTE MANAGEMENT

Exact quantitative calculation about reserve/saleable production/waste generated in RBM mining project is not possible but logical classification/assessment may be considered so within Ultimate Mineable Reserve in this project i.e. 14652 tonnes/year, of 61% is considered/ assessed as saleable production for proposed mining lease i.e. 9009 tonnes/year and 39% of total material has been considered as waste material, it includes wastage during transportation and unused/ low value material like silt/clay etc. It will be backfilled into the mined area.

14.14 SAFETY AND SECURITY

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 condition, which are adequately safe and healthy. At the same time the environment should be such as not to impair his working efficiency. This is possible only when there is adequate safety in mines. Hence, mine 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. All vehicles will be supervised manually and would be in good condition. The picking and extractions of minor minerals shall be carried on only up to a depth of 1.5 meters therefore no blasting is involved. Hence there is no danger and no special precautions are required.

14.15 DISASTER MANAGEMENT AND RISK MANAGEMENT

As per proposal made under the mining plan, during proposed working the area will be developed by means of manual opencast mining method. Exploitation and transportation of minerals are to be carried out by manual means. Water table will not be touched during processed working. No high risk accidents like landslides, subsidence flood etc. have been apprehended. No blasting is involved, picking and extractions of minor minerals (sand,



bajari & boulders) shall be carried on only up to a depth of 1.5 meters therefore negligible scope of landslides & subsidence.

CHAPTER-15

CONCLUSION

The proposed project involves collection of sand, bajri and boulder which is in high demand in the local market which is used in making bridges, road & building material etc. The management will recruit the semi-skilled & unskilled workers from the nearby villagers. For different activities such as Mining, sizing (sieving), transportation and plantation activities. The project activity will not have any major impact on the environment. The project will help to flow river water that in turn will prove helpful in avoiding flood situation. The lessee will undertake mining activity as per the plan indicated in this Mine Plan with proper taking care of environment aspects i.e. without disturbing the environment condition. It is concluded that the mining activities having substantial, but reversible impact on environment and the suggestive measures should be taken so as to minimize the impacts.

