

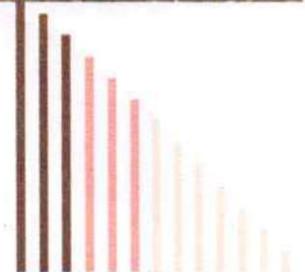
# MNING PLAN

## MINOR MINERAL AUCTION LEASE

OF  
PART OF RIVER YAMUNA,  
KEDARPUR QUARRY I,  
LETTER OF INTENT  
ISSUED IN FAVOUR OF  
M/s AKHILESH ENTERPRISES,  
SPA Shri KULDEEP SINGH  
VILLAGE DANDA & P.O RAJPUR  
TEHSIL PAONTA SAHIB,  
DISTRICT SIRMAUR, HIMACHAL PRADESH



2017



MINING PLAN  
OF  
MINOR MINERAL CONTRACT AREA  
KEDARPUR QUARRY -I,

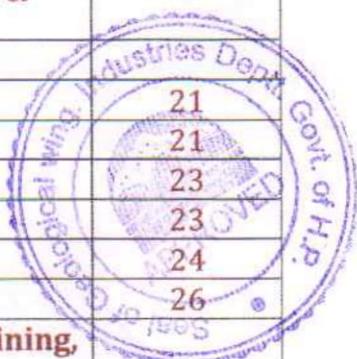
Letter of Intent  
Issued in Favour Of  
GRANTED IN FAVOUR OF  
M/s AKHILESH ENTERPRISES, SPA Shri KULDEEP SINGH,  
R/o DANDA, P.O. RAJPUR, TEHSIL PAONTA SAHIB,  
HIMACHAL PRADESH

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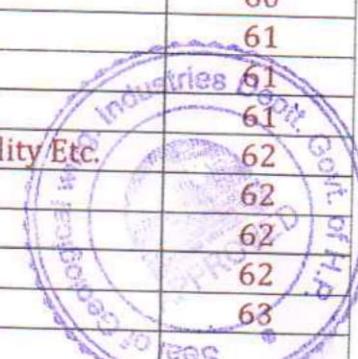
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## खण्डगाम

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खण्डगाम नगरपालिका विभाग  
खण्डगाम नगरपालिका विभाग  
खण्डगाम नगरपालिका विभाग

प्रामाणीय शाखा  
उद्योग विभाग शिमला  
Ecological wing  
Dept. of Industries  
Shimla

### APPROVED

With Conditions

लौं वे साथ अनुमोदित

ide Letter No. Landyog-Bdn (Kdani-4) Laydn-528/2017 - 12324  
ated.. 1-3-18

Signature

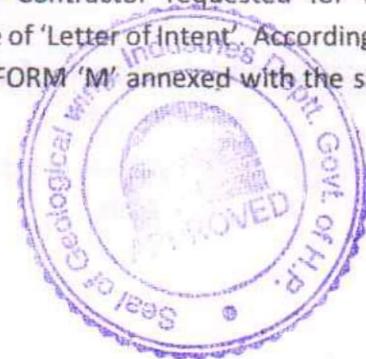
State Geologist  
Shimla District

**MINING PLAN  
OF  
MINOR MINERAL AUCTION CONTRACT AREA,  
KEDARPUR QUARRY -I,  
FOR  
SAND, STONE AND BAJRI,  
SITUATED IN  
KHASRA No 857,  
MEASURING 12.4100 HECTARES,  
FALLING IN  
MAUZA & MOHAL KEDARPUR  
TEHSIL PAONTA SAHIB, DISTRICT SIRMAUR,  
LETTER OF INTENT,  
GRANTED IN FAVOUR OF  
M/s AKHILESH ENTERPRISES, SPA Shri KULDEEP SINGH,  
R/o DANDA, P.O. RAJPUR, TEHSIL PAONTA SAHIB,  
HIMACHAL PRADESH**

**INTRODUCTION:**

M/s Akhilesh Enterprises with SPA Shri Kuldeep Singh, R/o Danda, P.O. Rajpur, Tehsil Paonta Sahib, District Sirmaur, Himachal Pradesh, have been issued a conditional 'Letter of Intent' for auctioned quarry, Kedarpur Quarry I, for excavating sand, stone and bajri vide letters Nos. Udyog-Bhu (Khani-4) Laghu-528/2017-14043 dated 08-03-2017.

In accordance with condition 2 of 'Letter of Intent' and Rule 35 of the 'Himachal Pradesh Minor Minerals (Concession) and Prevention of Illegal Mining, Transportation, and Storage) Rules 2015' the Contractor must submit 'Mining Plan' for five years of the area applied or granted for mining Contract. Therefore, Contractor requested for the preparation of Mining Plan of the area after the issuance of 'Letter of Intent'. Accordingly, this 'Mining Plan' is prepared in accordance with the 'FORM M' annexed with the said Rules.



**MINING PLAN- Kedarpur-I (Yamuna River) Quarry,**  
M/s Akhilesh Enterprises, Paonta Sahib, Sirmaur.

The Contracted block is a part of perennial River Yamuna; it lies at about 2 Km. from Paonta Sahib Bus Stand, a sub-Divisional town of district Sirmaur, Himachal Pradesh.

**1. General**

**1.1 Name and address of the applicant**

**1.1. A. Name of the applicant –**

M/s Akhilesh Enterprises, Care SPA Shri Kuldeep Singh.

**1.1. B. Address of the applicant –**

Village Danda, P.O. Rajpur,  
Tehsil: Paonta Sahib, District: Sirmaur.

**1.2 Status of the applicant**

Applicants are the highest bidders in auction of the quarry.

**1.3 Minerals which the Applicant intends to mine**

The applicants intend to mine stone, bajri and sand. The stone, sand & bajri collected from the river bed for open sale to construction industry depending upon the market demand.

**1.4 Period for which the mining leases/contract is granted.**

The quarry is auctioned for 15 Years.

**1.5. Name and address of the RQP preparing the  
Mining Plan:**

Jhumpa C. Jamwal  
No. 21, Type IV, HP Government Officers  
Residences, Mcleli, Shimla,  
RQP Registration No. HP/RQP/21/1/2016  
Mobile No. 9418909890

**1.6 Name and address of the prospecting agency**

The detailed prospecting of the area was carried out by the R Q P for preparation of this report. The secondary base data is collected from various sources such as Geological reports of the Geological Survey of India and various departments of Union and State Government.

**2. Location and Approach of the contract area**

**2.1 Topo-sheet**

Survey of India sheet No.

H43L11

Scale;

1:50,000



2

Surveyed in 1988-89 up dated in 2004-05;  
First Edition 2009.



Figure 1: Location and coordinates of auctioned contract area.

The area lies between the latitude and longitude given below in table 1 and shown in the figure 1 & 2.

Table 1: Showing latitude and longitude of the area

Latitude	Longitude
30°25' 39.8033"N	77°35' 41.2238"E
30°25' 40.2386"N	77°35' 47.5955"E
30°25' 34.5528"N	77°35' 23.1809"E





Figure 1 A: Coordinates of Contract area as seen of Google Imagery.

## 2.2 Location of area of Contract.

### 2.2 a Details of area

The revenue details of the area are given below in table 3.

Table 2: The detail of the Contracted-out area

Khasra Number	Area In Hectares	Status	Owner of Land	Kism	Mauza
857	12.4100	Kabja forest land	Government land	Gair Mumkin Yamuna	Kedarpur
12.1400 Hectares.					

### 2.3 Address & Detail of Contract

Village: -	Kedarpur
Patwar Circle: -	Paonta Sahib
Post Office: -	Kedarpur
Tehsil: -	Paonta Sahib
District: -	Sirmaur
Sub-Divisional Office (Civil):	Paonta Sahib
Divisional Office (Forest): -	Paonta Sahib
Range Office (Forest): -	Paonta Sahib
Sub Divisional Office (IPH): -	Paonta Sahib
Sub Divisional Office (PWD): -	Paonta Sahib
State :	Himachal Pradesh.

### 2.4 Distances from Important Places:

The important distances, from the Contract area are given below in table 2.



Table 3 :Showing important distances from the area.

Sr. No	Place	Distance
1	Paonta Sahib (Sub-Division Office) • Road	6 Km
2	Nahan (District Headquarter) • Road	43 Km
3	Shimla (State Capital), • Road • Narrow gauge Railway • Airport	176 Km
4	Chandigarh, (U.T.) • Road • Broad Gauge Railway • Airport	115 Km
5	Dehradun • Road • Broad gauge Railway • Airport (Jolly Grant)	122 Km
		53 Km
		83

2.5 Approach of the Area



Figure 2: Approach to the Quarry site.

The area is approachable from Paonta Sahib via NH 7 and via link road to Kedarpur Village and further by Track through the river bed as shown in figure 2.

### 3. Physiographical Aspect of the Area

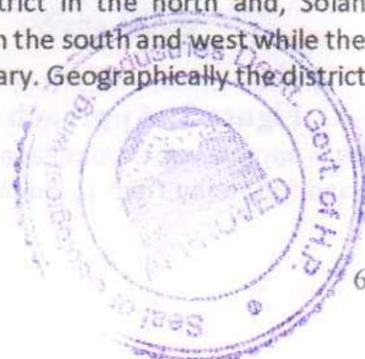
#### 3. 1 General

The Contract area is situated in the Kiar -Da- Dun. In general the area is a part of Siwalik range, particularly the part of Dun Valley .The Siwalik Hills are located within the political boundaries of Pakistan, India, Nepal, and Bhutan, and ranges between 6 to 90 km in width. They gradually become steeper and narrower in relief and width respectively, from northern Pakistan to Bhutan (over 2000 km in length). Ongoing erosion and tectonic activity has greatly affected the topography of the Siwaliks. Their present-day morphology is comprised of hogback ridges, consequent, subsequent, obsequent, and resquent valleys of various orders, gullies, choes (seasonal streams), earth-pillars, rilled earth buttresses of conglomerate formations, semi-circular choe-divides, talus cones, colluvial cones, water-gaps, and choe terraces. Associated badlands features include the lack of vegetation, steep slopes, high drainage density, and rapid erosion rates. To the south of the Siwaliks are the Indo-Gangetic plains and in the north, they are bordered by the Lesser Himalayas

Intermittently located between the Siwaliks and the Lesser Himalayas (exclusively in India and Nepal) are *duns*, flat-bottomed longitudinal structural valleys with their own drainage systems. These essentially comprise several large Himalayan piedmont alluvial fans and terraces, which formed as a result of tectonic episodes in the flanking Siwaliks. The *duns* also consist of lacustrine, fluvial, aeolian and swamp-environment deposits, and range from Middle Pleistocene to Holocene in age. During their formative stage, most of the *duns* were slightly narrower and have gradually expanded over time through the erosion of the adjacent Siwaliks sediments (a continuing process). In Nepal, these *duns* were often naturally filled with alluvial sediments of lacustrine and fluvial deposits, thus burying palaeolithic sites that were later exposed through erosion. The monsoon rains temporarily supply seasonal streams (locally known as choes, Rivers, or nala) located both within the Siwaliks hills and the adjacent *duns*. These stream banks and their terraces yield sizeable numbers of lithic artefacts, owing to the shared location for both water and raw-material.

The district is bounded by Shimla District in the north and, Solan District in the north-west, state of Haryana in the south and west while the state of Uttranchal makes its eastern boundary. Geographically the district can be divided into three parts (Figure 4).

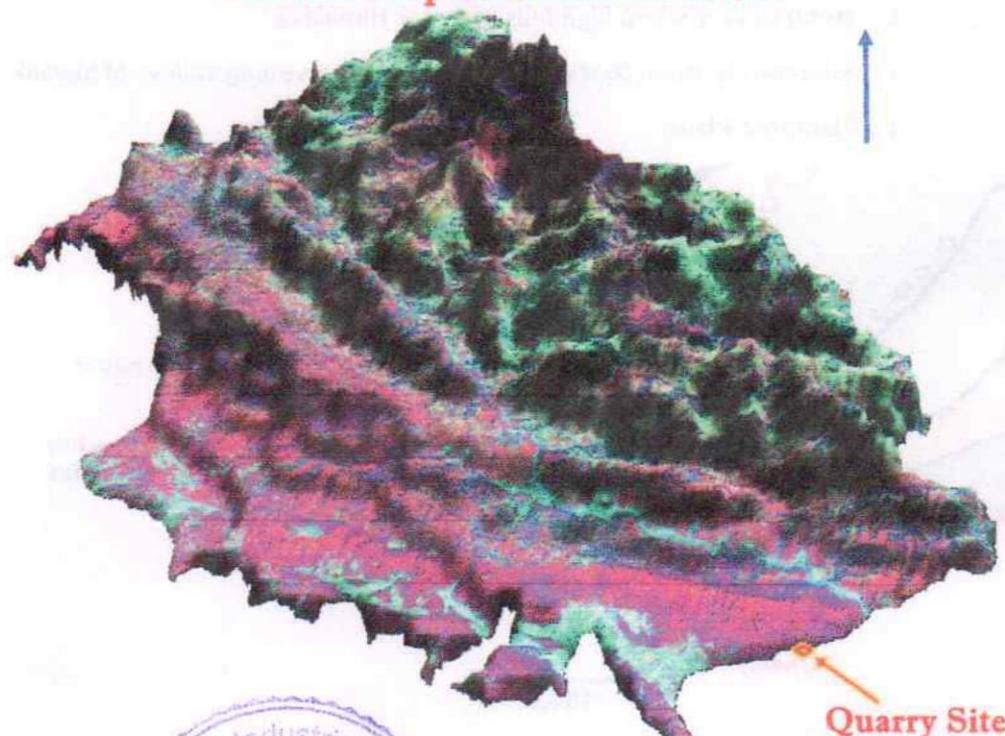
1. The Trans - Giri (Giri Par Region)
2. Cis- Giri Region (Giri War Region)



### 3. Plains of Kiar-da-dun or dun valley

The Trans – Giri region consists of the mountains culminating into the Chur Peak which is commonly known as Chur Chandni Ki Dahr (the hill of silver bangle). It has an altitude of 3647 meter above the mean sea level. From this lofty mountain runs two ranges one in the north – west direction called Dhar Tapoli-Jadol and other Dhar Nohra which runs south – east direction toward Haripur Fort at an altitude of 2677 meter above the mean sea level where it is divided into two ranges, one of which runs almost east to the valley of Tons. Two other ranges run north – west called Dudham Dhar and south- west with many minor spurs from them toward the Giri River. The second range initially runs south – west under the name of Dhar Nagali and then turns to east under the name of Dhar Kamrau. Dhar Shalai runs parallel to this Dhar ub northern side and both form the valleys of Nera River.

### Terrain Map of District Sirmaur



3-D Surface View (District Sirmaur)

Figure 3: Showing the 3-D Surface view of District Sirmaur.

**MINING PLAN- Kedarpur-I (Yamuna River) Quarry,**  
M/s Akhilesh Enterprises, Paonta Sahib, Sirmaur.

The Cis- Giri region is intersected by three main ranges which runs from north-west to south-east, the Sain Dhar which runs parallel to the Giri River. The second is the Dharti Dhar or what is called little range. Between these two ranges flows Jalan River. The third is quite low range, which runs from Kala Amb area to south of Nahan tehsil and form an open valley with Dahi Dahr. In the western half of this flow the Markanda River. Between eastern extremities of this Dharti Dhar lies open valley Known as Kiar -da - dun valley which border the Yamuna and Giri River in the east and form the boundary of District with Uttrakhand. It also touches western portion of Nahan tehsil. This flat valley is irrigated by Bata River which flows from east to west originating from Dhati Dhar.

Geomorphologically the district can be divided into three zones

1. Steep to very steep high hills of lesser Himalaya
2. Moderately steep to steep low hills and intervening valleys of Siwalik
3. Piedmont Plains

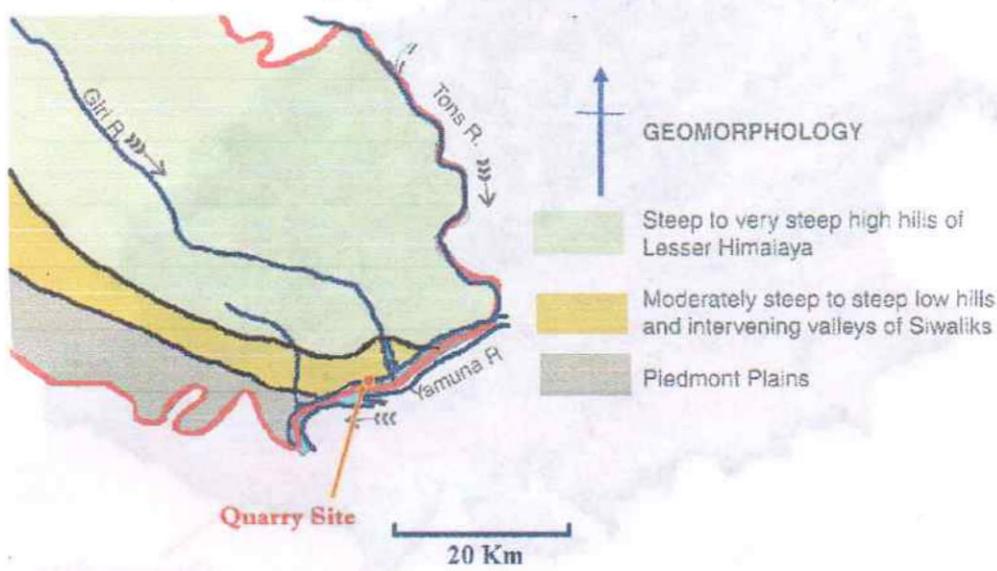


Figure 4: Geomorphological Map of part of District Sirmaur.



**The Contract is situated in the River Yamuna, a primary tributary of the River Ganga.** The river Yamuna, a major tributary of river Ganges, originates from the **Yamunotri** glacier near Banderpoonch peaks ( $38^{\circ} 59' N$   $78^{\circ} 27' E$ ) at an elevation of about 6387 meters above mean sea level in district Uttarkashi (Uttarakhand). The Yamuna catchment drains the Punjab- Kimaon Himalayas from Shimla in northhwest to Mussoorie in the southeast. After flowing in a southeasterly direction for about 120 Km, it is joined by its principal tributary, the Tons near Dakpathar. The Tons drains a large catchment area hence carries a large volume of water than the main river Yamuna. From the west, another important tributary, the Giri, Joins the main river near Paonta Sahib. The river pierces the lower Shiwalik range and enters the plains near Tajewala. From Tajewala onward it flows in a southerly direction for 240 km up to the Okhla headwater near Dehli. The Yamuna after receiving water through other important tributaries joins the river *Ganga* and the underground *Saraswati* at Prayag (Allahabad) after traversing about 950 Km.

The catchment of Yamuna river system covers parts of Uttar Pradesh, Uttarakhand, Himachal Pradesh, Haryana, Rajasthan, Madhya Pradesh & Delhi states.

The tributaries contribute 70.9% of catchments area and balance 29.1% accounted for direct drainage into the Yamuna River or to the smaller tributaries.

### 3.2 Altitude of the contract area

- The highest point of Contracted area is 330 meters above mean sea level.
- The lowest point of the Contracted- area is 323 meters above mean sea level.

### 3.3 Climate of the Area

The Climate of the Contract area can be classified into following three categories

1. Winter
2. Summer
3. Rainy

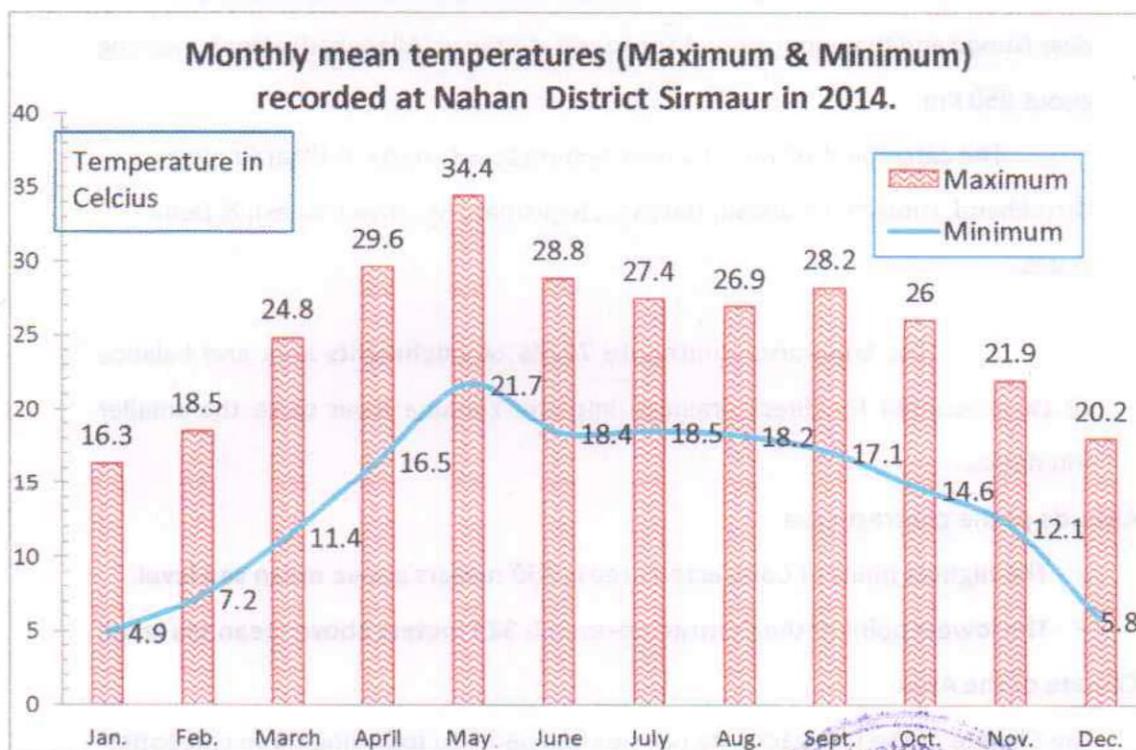


The climatic information given below is based on the data obtained from I.M.D. Archives, Pune. The Indian Meteorological Department is maintaining a Meteorological Station at Dhaulakuan (Poanta Sahib).

Climate of Contracted area, District Sirmaur,			
Climate	Winter	Summer	Rainy
Period	Oct.-Mid March	Mid-March-June	July-September
Weather	Cool	Hot	Humid

#### Temperature

The monthly Maximum and minimum temperature recorded at Nahan in the District is given below in the Figure 5.

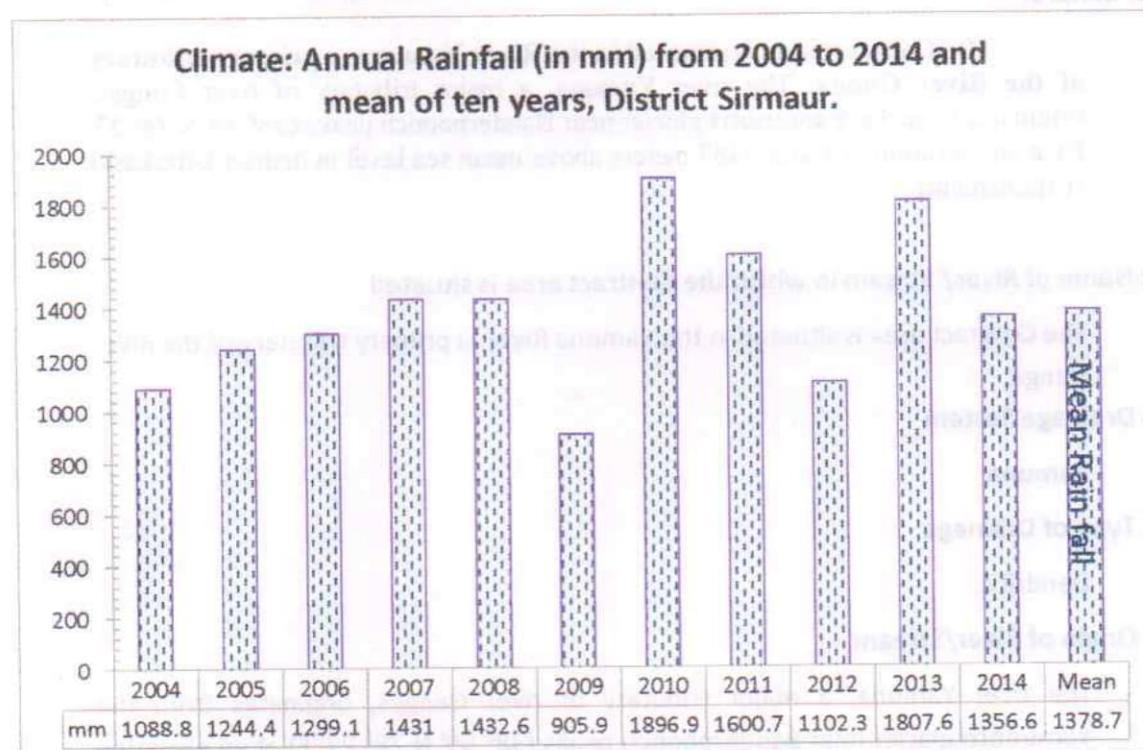


**Figure 5: Showing average Monthly maximum & minimum temperature recorded at Nahan**



### 3.4 Rainfall of the area

Year wise rainfall recorded in the district from 2004 to 2014 and mean of this period is shown in figure 6.



**Figure 6: Rainfall data of the District from 2004 to 2013**

### 3.5 Any Important feature

The contract area is part of River Yamuna falling Himachal Pradesh near the border with Uttarakhand.

### 3.6 Description of Quarry Area

The mining Contract area fall in the braided branch of River corridor of the River Yamuna.



## PART I

### 1. DESCRIPTION OF GEOMORPHOLOGY AND MINE DEVELOPMENT

#### 1.1. General

**The Contract area is situated in the River Yamuna, a primary tributary of the River Ganga.** The river Yamuna, a major tributary of river Ganges, originates from the **Yamunotri** glacier near Banderpoonch peaks ( $38^{\circ} 59' N$   $78^{\circ} 27' E$ ) at an elevation of about 6387 meters above mean sea level in district Uttarkashi (Uttarakhand).

#### 1.2 Name of River/ Stream in which the Contract area is situated

The Contract area is situated in the Yamuna River, a primary tributary of the River Ganga.

#### 1.3 Drainage System

**Yamuna**

#### 1.4 Type of Drainage

Dendritic.

#### 1.5 Origin of River/Stream

The river Yamuna, a major tributary of river Ganges, originates from the **Yamunotri** glacier near Banderpoonch peaks ( $38^{\circ} 59' N$   $78^{\circ} 27' E$ ) at an elevation of about 6387 meters above mean sea level in district Uttarkashi (Uttarakhand).

#### 1.6 Altitude at Origin

**6387 meters above Mean Sea Level.**

#### 1.7 Geometry of the catchment of the river

##### Geometry of Yamuna River Catchment

**Total area of catchment = 11394 SqKm**

**Area of Catchment up to the Himachal Pradesh = 11394 SqKm.**

**Number of Major tributaries on right bank = 13**

**Number of Major tributaries on left bank = 9**

**Stream order up to Contract area = 4**

**Maximum length of water shed = 140 km**

**Maximum breadth of water shed = 125 Km**



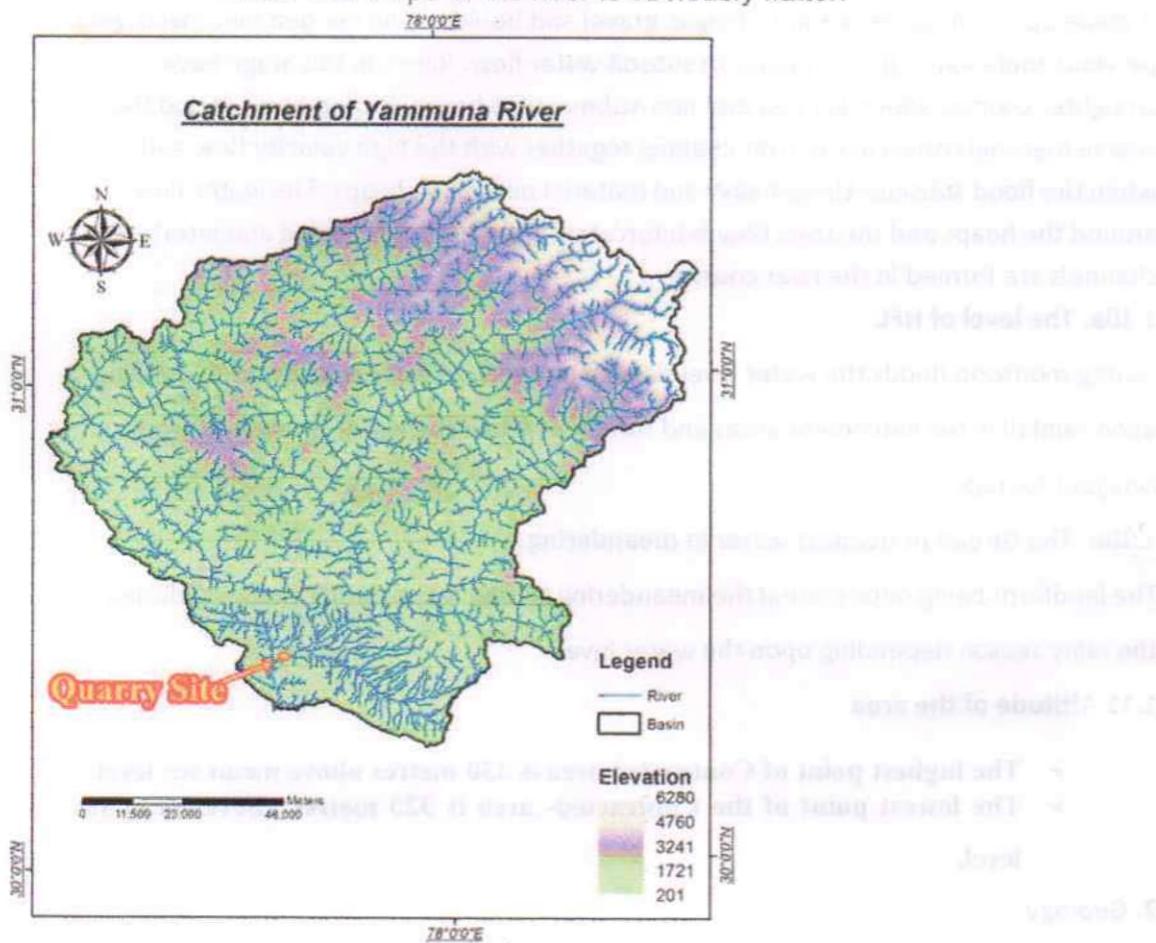
Length breadth ratio = 1: 1.2,

Higher the ratio, higher is the asymmetry of water shed.

Elevation at Contract area = 329 M

**Stage of the River- Sub-Mountainous Stage**

Here river leaves the mountain and enters sub-mountainous tract. The slope of the river is obviously flatter.



**Figure 7: Yamuna catchment area up to Tajewala Barrage.**

#### 1.8 The annual deposition at the place of mining:

The annual deposition of river-borne material brought down by the river water is about six centimeters in the Contracted- area depending upon the Location. At some places, it may be more than the eight centimeters.

#### 1.9 The Competency of the River/ Stream at the mining site

The general competency at the mining area is six to 30 Kilograms approx.

- The largest boulders vary 15 to 70 cm X 8 to 35 cm X 12 to 45 cm (length X Width X height).

### 1.10 Meandering Pattern of River

Here river leaves the mountain and enters sub-mountainous tract. In this stage, the bed is made up of a mixture of sand, shingle, gravel and boulders. As the bed material is very pervious there exists good amount of subsoil water flow. Rivers in this stage have straighter courses with wide bed and non-submersible banks. During flood period the coarse material comes in the river channel together with the high velocity flow and when the flood subsides these heavy material piles up in heaps. The water flows around the heaps and the river flow is bifurcated. Thus, shifting braided and interlaced channels are formed in the river course.

#### 1.10a. The level of HFL

During monsoon floods the water level rises to one to 1.25 metres, at times depending upon rainfall in the catchment areas and run off or when the water is released from Dhalipur barrage.

#### 1.10b. The thread of deepest water in meandering.

The landform being depositional the meandering thread is constantly changing during the rainy season depending upon the water level.

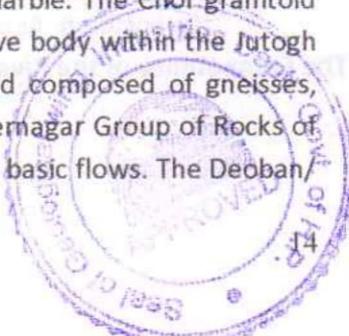
### 1.11 Altitude of the area

- The highest point of Contracted area is 330 metres above mean sea level.
- The lowest point of the Contracted- area is 323 metres above mean sea level.

## 2. Geology

### 2.1 Regional Geology (of Catchment Area)

Sirmaur District lying within the Lesser Himalaya and the Shiwalik Foothill comprises rocks ranging in age from Proterozoic to Quaternary. The oldest rocks of undifferentiated Proterozoic age belong to the Jutogh Group Comprising carbonaceous phyllite, schist, gneiss, quartzite and marble. The Chorgranitoid (Undifferentiated Proterozoic age) occurs as an intrusive body within the Jutogh Group of rocks. This granite body is well foliated and composed of gneisses, granite with minor aplite and basic veinlets. The Sundernagar Group of Rocks of Meso- Proterozoic age is represented by quartzite with basic flows. The Deoban/



Shali Group of Rocks (Meso- Proterozoic) Comprising limestone, dolomite, (at places stromatolytic) slate, & quartzite occurs along the Main Boundary Fault and also in the northeastern part of the District. The argillo- arenaceous sequence of Shimla/Jaunsaur Group rests unconformably over the Deoban Group. The Jaunsaur Group of arenaceous rocks is homotaxial with Shimla Group and assigned Meso-Proterozoic age. Both Shimla and Jaunsaur Group of rocks are unconformably succeeded by the Baliana Group, comprising diamictite, pink dolomite, carbonaceous shale and slate besides quartzite bands. The Krol Group which overlies the Baliana Group is dominantly a carbonaceous sequence with minor shale and sandstone. The Tal Group of Early Cambrian age is heterolithic sequence of siltstone, dolomite, shale, ash grey tuff, chert/phosphorite, carbonaceous shale, grit and quartz arenite and recorded algal structures and trilobite. Subathu Formation is exposed as window and lies within the Krol belt in Tons Valley. It is composed of olive green shale, limestone, quartzite and laterite. The Sirmaur Group is represented by a thick pile of Palaeogene sediments exposed in the foothill, bounded by the Main Boundary Fault and Krol Thrust. It comprises shale, fossiliferous limestone, quartz arenite, siltstone, clay, sandstone and local pebble bed. The Shiwalik Group of Middle Miocene of Early Pleistocene age comprises coarse clastic fluvialite deposits of sandstone, clay and conglomerates. The Quaternary sediments (Older Alluvium and Newer Alluvium) along prominent channels consisting of sand, silt, clay, pebbles and cobbles occurring along present channels of Middle to Late Pleistocene and Holocene age.

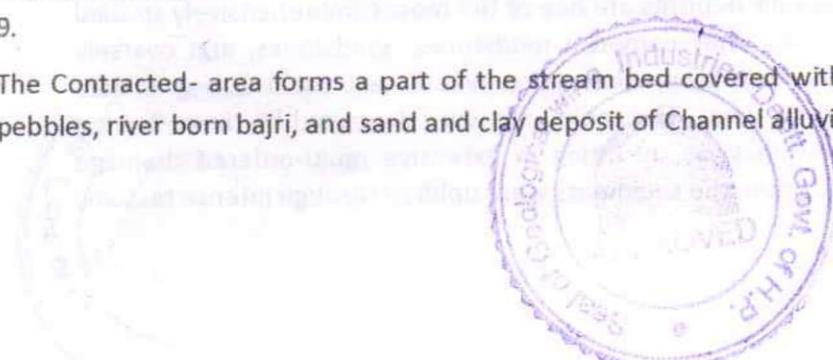
The general trend of the rocks is NW-SE and E-W directions with dip varying from  $10^{\circ}$  to  $40^{\circ}$  on either side. Beside Main Boundary Fault, Krol, Giri, Chail and Jutogh Thrust two major synformal axes running NW-SE also passes through Krol and Tal Group of rocks.

The figure 9 shows regional geology of the area and the general stratigraphy of the district.

## 2.2 Local Geology

The rocks of the Giri-Yamuna Catchments mainly belong to pre-Cambrian to the Siwalik Group, Older Alluvium, and Newer Alluvium. The stratigraphy of the effective Catchments is given in the table below and the geology of the area is given in the figure 9.

The Contracted- area forms a part of the stream bed covered with boulders, cobbles, pebbles, river born bajri, and sand and clay deposit of Channel alluvium. The rocks along



the banks are Terrace Alluvium and Fan Alluvium and in higher reach of catchments Upper Siwalik Formation

The lithostratigraphy of the area near Contract is given below in figure 8.

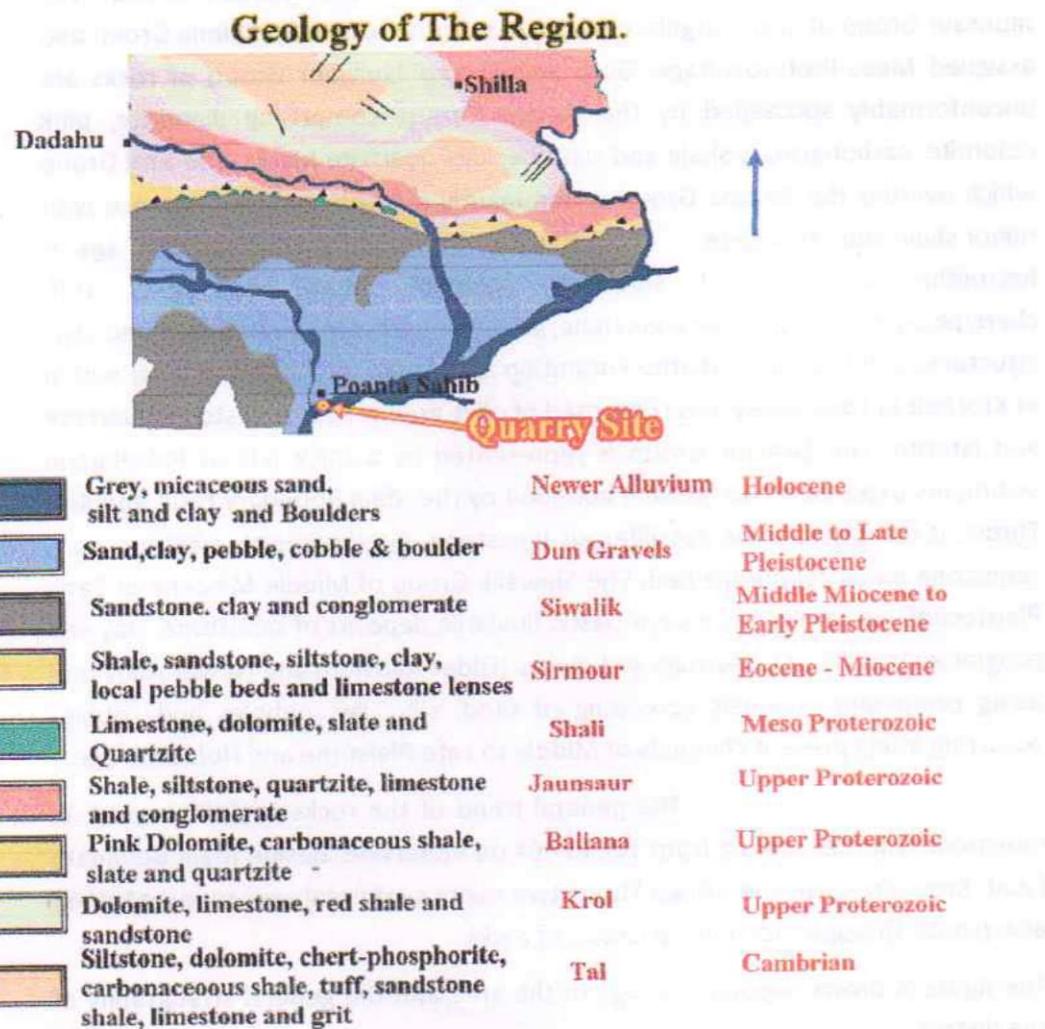


Figure 8; Geological Map of The Region.

### 2. 3.1: Siwalik Group

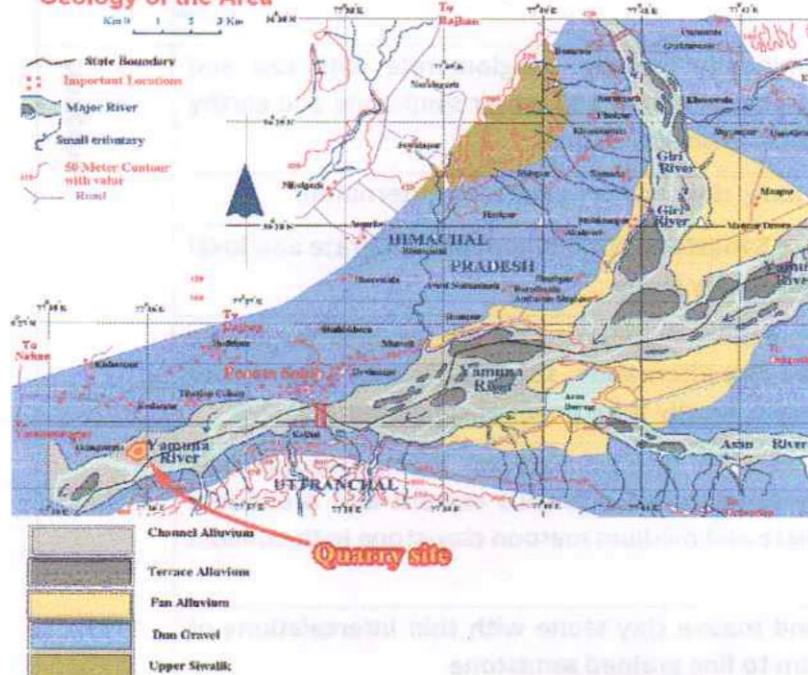
The Siwalik deposits are one of the most comprehensively studied fluvial sequences in the world. They comprise mudstones, sandstones, and coarsely bedded conglomerates laid down when the region was a vast basin during Middle Miocene, to Upper Pleistocene times. The sediments were deposited by rivers flowing shwards from the Greater Himalayas, resulting in extensive multi-ordered drainage systems. Following this deposition, the sediments were uplifted through intense tectonic



**MINING PLAN- Kedarpur-I (Yamuna River) Quarry,**  
M/s Akhilesh Enterprises, Paonta Sahib, Sirmaur.

regimes (commencing in Upper Miocene times), subsequently resulting in a unique topographical entity - the Siwalik Hills. The Siwalik are divided stratigraphically into three major Subgroups - Lower, Middle, and Upper. These Subgroups are further divided into individual Formations that are all laterally and vertically exposed today in varying linear and random patterns.

**Geology of the Area**



**Figure 9: Local Geology of contracted area & Surroundings.**

Ongoing erosion and tectonic activity has greatly affected the topography of the Siwalik. Their present-day morphology is comprised of hogback ridges, consequent, subsequent, obsequent, and resquent valleys of various orders, gullies, choes (seasonal streams), and earth-pillars, rilled earth buttresses of conglomerate formations, semi-circular choe-divides, talus cones, colluvial cones, water-gaps, and choe terraces. Associated badlands features include the lack of vegetation, steep slopes, high drainage density, and rapid erosion rates.

**Table 4**

**Table-6: Lithostatigraphy of the Yamuna River surrounding the Contracted area**

Group	Lithology		Age
Newer Alluvium	Channel Alluvium	Grey micaceous, fine to coarse grained sand, silt and clay	Quaternary
	Terrace Alluvium	Cyclic sequence of grey micaceous sand, silt and clay	

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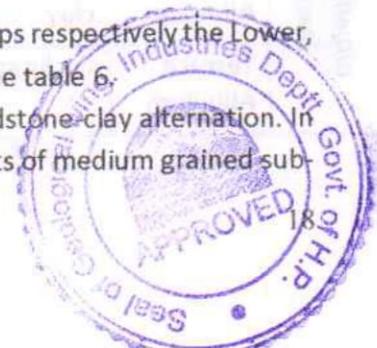
	Fan Alluvium	Brownish grey clay, sand and gravel with boulders		
Older Alluvium	Dun Gravels	Multi-cyclic sequence of brown to grey silt, clay with kankar and reddish brown to grey micaceous sand with pebbles		
Siwalik Group	Upper Siwalik	B	Predominantly massive conglomerate with red and orange clay as matrix and minor sandstone and earthy buff and brown clay stone	Neogene
			Sandstone, clay, and conglomerate alternation	
	Middle Siwalik	B	Massive Sandstone with minor conglomerate and local variegated clay stone	
			Predominantly medium to coarse- grained sandstone and red clay alternation, soft pebbly with subordinate clay-stone, locally thick prism of conglomerate	
	Lower Siwalik	B	Alternation of fine to medium- grained sporadically pebbly sandstone, calcareous cement and prominent chocolate and medium maroon clay-stone in the middle part	
			Red and mauve clay stone with thin intercalations of medium to fine grained sandstone	

In the advent of Neogene, a depression was formed in front of the rising mountains (Proto- Himalaya). This depression becomes a repository of a thick sequence of molassic sediments of the Siwalik. The Siwalik Group comprising conglomerates friable micaceous sandstone, siltstone, and clay-stone.

The conglomerates in general are poorly cemented but at places they are very hard. These consist mainly of pebbles and cobbles of quartzite. The stray pebbles of granite, limestone, sandstone, breccias and lumps of clay-stone are also observed at places. Often the size of pebbles is large enough to be called as Boulders. The conglomerates not only occur as regular band but also as lenticular bands alternative with micaceous sandstone and clay-beds. The sediments were brought down 2 to 25 million years ago by the numerous fast flowing rivers issuing forth from rapidly Rising Mountain mass of the Himalaya, in the north.

The Siwalik Group is divisible into three sub-groups respectively the Lower, Middle, and Upper based on the lithostratigraphy as given in the table 6.

**Lower Siwalik:** - The lower Siwalik consists essentially of a sandstone-clay alternation. In district Sirmaur the lower sequence of the lower Siwalik consists of medium grained sub-



graywacke inter-bedded with thick red clay, but higher up in sequence, sandstones are coarser and clasts become more frequent while the clays are less developed. The uppermost horizon consists of conglomerate with well-rounded clasts of grey quartzite possible derived from the Shali. The total thickness is 1600 mts.

**Middle Siwalik:** - The Middle Siwalik Sub group comprises of large thickness of coarse micaceous sandstone along with some inter-beds of earthy clay and conglomerate. It normally succeeds the Lower Siwalik along a gradational contact. The sandstone is less sorted than those in Lower Siwalik. Clay bands are dull coloured and silty. The general thickness is 1400 to 2000 metres.

**Upper Siwalik:** -Sandstone mainly represents, the Upper Siwalik inter-bedded with silt and conglomerate. The lower portion of the Upper Siwalik mainly consists of soft, massive, pebbly sandstone with intercalations of conglomerates. In the upper portion the conglomerate intercalation is replaced by the clays intercalations. The general thickness in the district is 2300 metres.

#### 2.2.2 Older Alluvium

The Older Alluvium in Dun valley is designated as Dun Gravels while in the plains as Varanasi (= Ambala). It is a multi-cyclic sequence of brown to grey silt, clay with kankar and reddish brown to grey micaceous sand with pebbles.

#### 2.2.3 Newer Alluvium

Newer Alluvium has been subdivided into Fan Alluvium composing brownish grey clay, sand and gravel sequence, and lies un-conformably over Older Alluvium within a narrow zone immediately to the sh of Siwalik hill. Trace alluvium exposed as depositional terraces of Yamuna River, is composed of cyclic sequence of grey, micaceous, fine to coarse grained sand, silt and clays. Channel alluvium exposed as point bar/channel bars within the active channels is composed of grey, fine to coarse micaceous sand and silts.

The area is comprising predominantly the quartzite Boulders, Sand and river born bajri of Sandstone.

The boulders are white, spotted white, greenish white, pink, purple and dark green in colour.

The geology of the Contracted- area is given in figure 8 & 9 and Map 2.

#### 2.3 Nature of the Boulder/ Cobble/ Sand.

The area lies within the regular course of the Yamuna River gets flooded in the rainy season

All the deposit comprises quartzite, sand and fraction of granite, limestone and breccias- fragments. The boulders are white, spotted white, greenish white, pink, purple and dark green in colour. Quartzite fragments are rounded, sub- rounded and discoidal in shape having smooth surface. Their size varies from gravel to boulder.

**MINING PLAN- Kedarpur-I (Yamuna River) Quarry,**  
M/s Akhilesh Enterprises, Paonta Sahib, Sirmaur.

Thickness of the deposit is more than ten metres. During the monsoon this bed replenishes to a large extend from the Siwalik and Dharamshala Formation rocks due to erosion by heavy flow in higher reached. Due to sudden decrease in the carrying capacity and competency of the river the annual deposition of six cm is received.



**Photo 1: Showing the nature of the river borne material of the Yamuna River in the Contracted area.**



**Photo 2: Showing the lease area**



## 2.4 The Nature of the rock along the bank

The rocks along the bank belong to Terrace alluvium and Dun gravel of Newer Alluvium Formation consisting of silt, clay, Sand and boulders, pebbles, cobbles etc.



**Photo 3 Photo proposed quarry area & Banks**

## 2.5 description of Annual Deposition with respect to Geology of the Catchment and other factors

The catchment area of about 12000 square kilometres, comprises of Cambrian to Siwalik formations and thus, has very large area for the replenishment of sediments as compare to the quantum of proposed extraction of mineral. The rocks in the catchment consist of granite, quartzite sandstone limestone etc. The catchment area is eroded by frosty snow in winter and heavy rains of monsoons.

## 3 Reserve Estimate

### 3.1 Percentage wise distribution of Mineral

The mining Contract area consist of mainly boulders, Bajri, cobbles, gravels, sand silt & clay. However, from commercial point of view it can be classified as stone, Bajri, sand &

silt. However, to verify the surface observations, a trial pit was dug having dimensions of 1 m. \* 1 m. \* 1 m. (Length \* width \* depth) and to estimate the percentage of each separated and weighed. The constituents of the Contract area are shown in figure 10. The percentage thus arrived is depicted in figure 11.

Classification of River bed Material According to Size (in Millimetres).

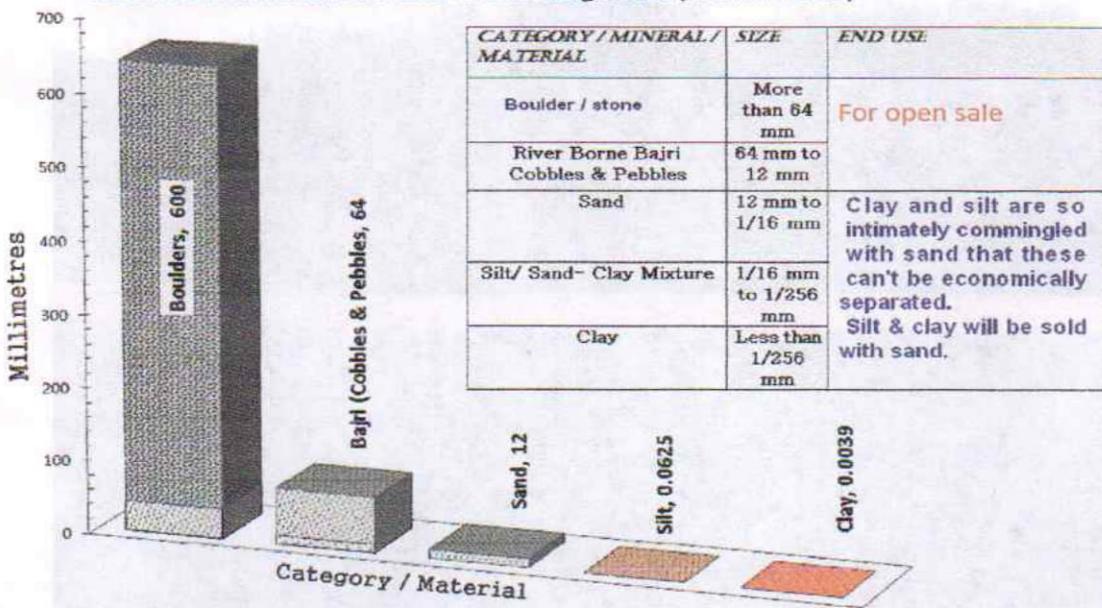


Figure 10: Constituents of Deposit.

Percentage of Minerals/Material in the Mining Lease Area

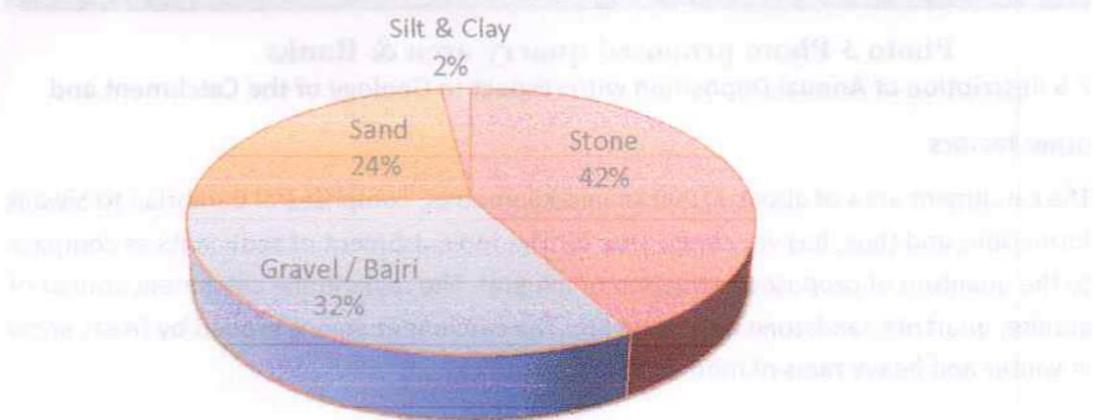


Figure 11: Percentage of material.

### 3.1a Specific Gravity

The specific gravity of Quartzite and other boulders and bajri is 2.65 and of wet sand is 1.92. Hence, average specific gravity of 2.25 is taken for calculation of the deposit.



### 3.2 Estimate of Geological Reserve.

The part of contract block falls within the River corridor, which computed to be 78530 square metres. However, the entire mining Contract area of 124100 square metres can be considered for estimation of geological Deposit, it is formed of river borne material. The estimated thickness of deposit is more than ten metres. However, considering five metres depth for purpose of estimation of Geological reserves and specific gravity to be 2.25, the **Geological deposits in the area are to a tune of about 1365750 metric tons.**

### 3.3 Estimate of Mineable reserves

The basic requirement of the Contractor will stone & river born bajri for sale in the market. Hence, the applicants intend to mine stone, bajri & sand by hand shoveling into tractor trolleys / tipper trucks and to transport to the construction site for sale. As per the policy guidelines issued by the State Government for Mining of River / Khad bed and to calculate the mineable reserve the following points are taken into consideration:

Thus, keeping in view the mining Rules and policy guidelines issued by the State Government for Mining of river/khad bed,

- ✓ A geological map on 1:2000 scale is prepared, and main litho-units were marked on the plan to know the surface spread of each unit.
- ✓ No mining is to be undertaken along the periphery of the Contract area if the mining is likely to cause any adverse impact on the adjoining land or the owners of the adjoining land has not given his consent for mining. One-meter area is proposed as safety zone as the depth of mining is constrained to one metre. Thus, 78530 square metres area is considered for mining.
- These river forms lenticular-shaped in-channel bar in this area. The river channel bifurcates around the bar, and follows a pattern resembling braided hair.
- ✓ Part of Contract area is situated in the river channel.
- ✓ This part of the River is flooded during Monsoon floods and is dry otherwise.
- ✓ No mining zone is defined after considering the 5-meter safe distance from the bank (HFL) or 1/10 of width from the bank to bank. The width of River is about 240 to 400 metres thus a safe zone from banks (HFL) of 24 to 40 metres has been provided.
- ✓ The water table level will go down as the water recedes after the monsoon.
- ✓ The depth of water table will be lowest in the pre-monsoon season.

The entire Contract area is available for mining for at least six months in a year.

- Season- that is post- monsoon to pre- monsoon.
- Nature river- It is perennial.

**MINING PLAN- Kedarpur-I (Yamuna River) Quarry.**  
M/s Akhilesh Enterprises, Paonta Sahib, Sirmaur.

- Distance from water flow.
- Height above surface water level.
- Width of river.
- Age of river at mining site.

✓ Though the river is perennial but this channel in which the Contract is situated is dry during the non-monsoon period, as the water recedes after monsoons. Hence mining will be possible in all the area only during the dry seasons and dry parts. It will therefore, will be possible to exploit minerals up to one metre depth in the entire safe block. **Keeping in view rate of replenishment of the River Yamuna in the area, the entire safe contract mineable block of 78530 square metre is considered for mining.** Though, the block will be rested during monsoons for replenishment. The mining in the area will be undertaken only for nine non-monsoon months.

#### 3.4 Estimate Annual Deposition of Mineral

- ✓ The annual replenishment of the material depends on the discharge, grade of river and geology of catchment area. The factor of six cms annual replenishment is assumed, while calculating the reserve. However, it is generally observed that replenishment of more than eight cm occurs in a year as all the old pits get filled with mineral during the very first flood of the monsoon. *Hence mined area of the pre-monsoon will be filled with mineral during monsoon and even during winter rains.*
- ✓ It is pertinent to mention that floods carry load from about 12000 square kilometres of catchment area above mining Contract.

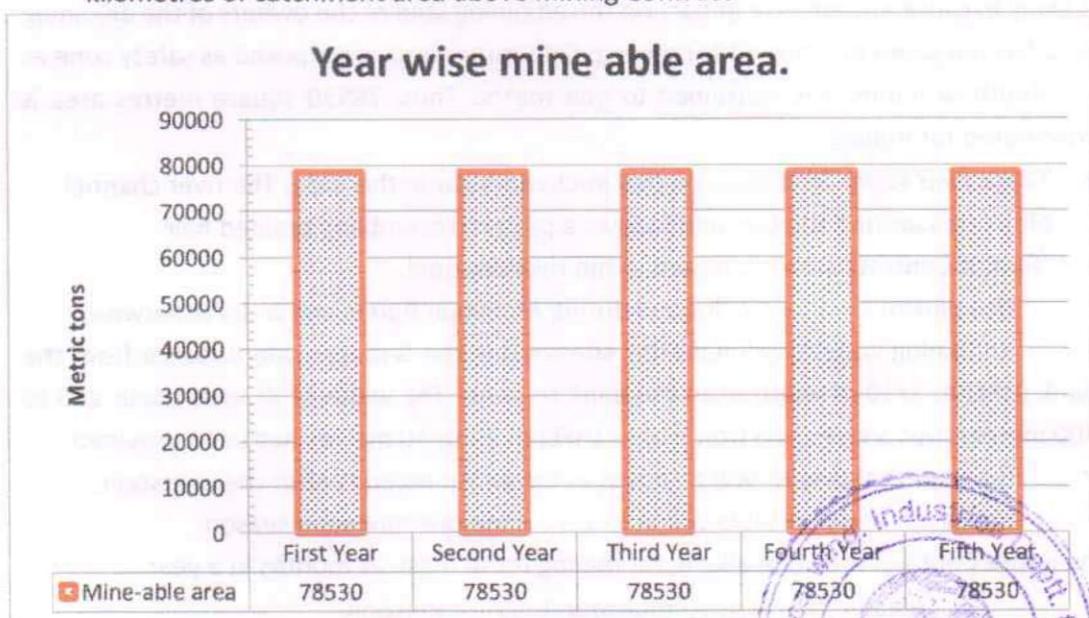


Figure 12: Showing year wise mineable area.

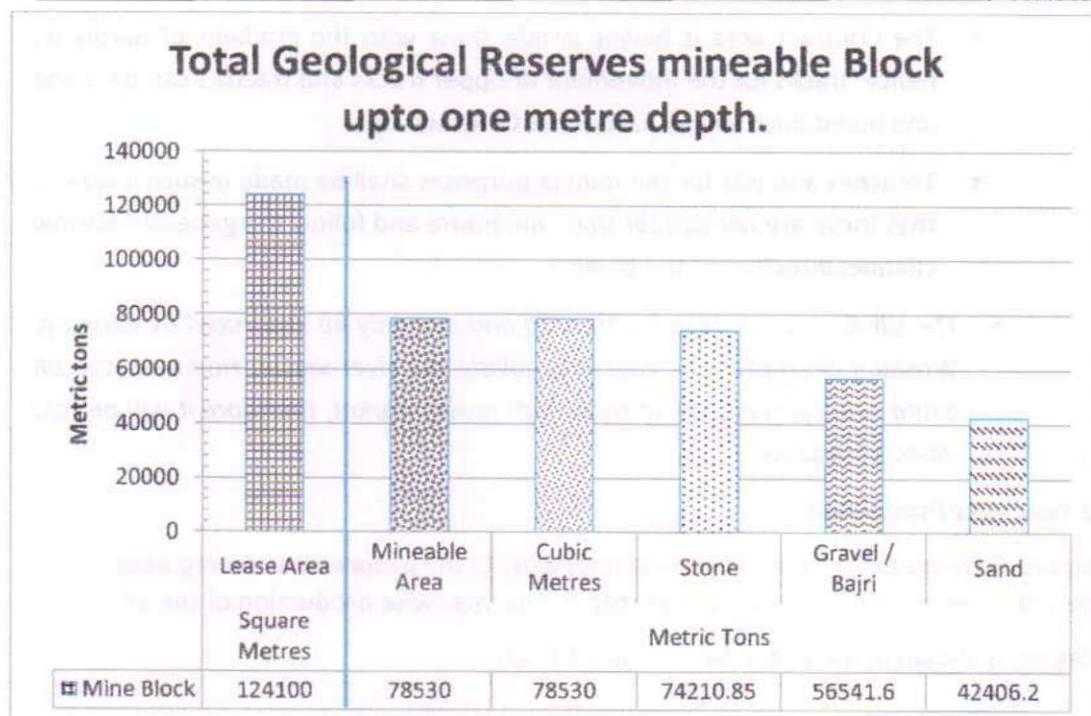


Figure 13: Mineable Reserves of auctioned block.

*The production of minerals has been rounded off in the progressive mining plan.*

### 3.5 Depth of Mining.

Mining will be restrained to a depth of one metre.

## 4. MINE DEVELOPMENT AND PLAN OF PROGRESSIVE MINING

### 4.1 Development & Production Program

The mining / collection of minerals shall involve shoveling by simple hand-tool, manual sorting / picking and stacking in the form of dumps at site and loading into truck / tractors-trailers for transporting them to market.

- No blasting is required.
- Only manual extraction of sand, stone & bajri will be undertaken.
- Mining activity will be undertaken only during the dry seasons and dry parts of the river.

**MINING PLAN- Kedarpur-I (Yamuna River) Quarry,**  
M/s Akhilesh Enterprises, Paonta Sahib, Sirmaur.

- The Contract area is having gentle slope with the gradient of hardly 8', hence, tracks for the movement of tipper trucks and tractors can be made and maintained in any part of the Contract area.
- Trenches and pits for the mining purposes shall be made in such a way so that these are not deeper than one metre and follow the general / normal channel direction of the River.
- *The silt & clay are mixed with sand and can only be separated by washing. Washing of sand in the river will pollute the river water. However, the silt being small percentage of sand finds ready market, therefore it will be sold along with sand.*

#### **4.2 Year wise Production**

***The production of minerals has been rounded off in the progressive mining plan.***

The year wise working is shown in the map 3. The year wise production of the all category is shown in the figure 14, 15, 16, 17 & 18.

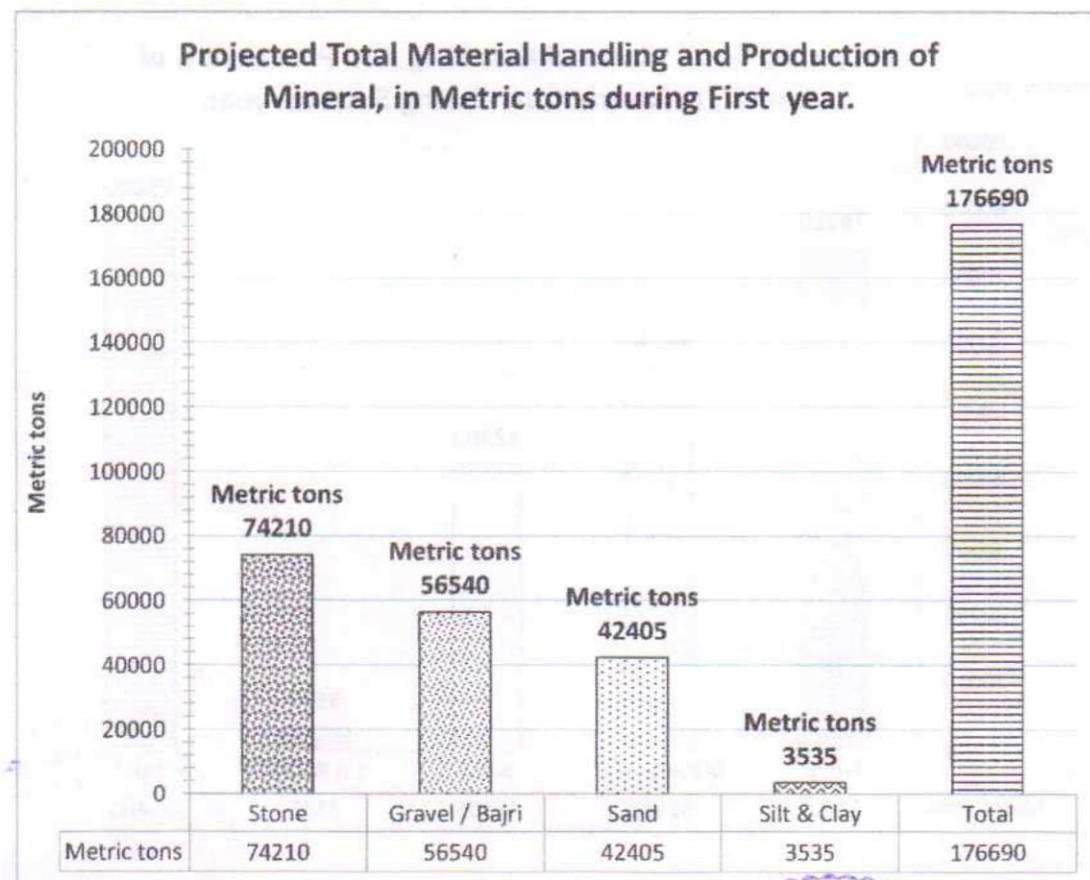


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**MINING PLAN- Kedarpur-I (Yamuna River) Quarry,  
M/s Akhilesh Enterprises, Paonta Sahib, Sirmaur.**

**4.2a Production of the First Year**

- ✓ Mining of 78530 cubic metres materials is proposed to be mined from 78530 sq meter of safe zone area in the lease area of 124100 square metres.
  - 74210 metric tons of Boulder and 56540 metric tons of Bajri will be produced which will be sold in the market.
  - 42405 metric tons of sand will be produced and sold in open market depending upon demand.
  - 3535 metric tons of silt and clay present as associated minerals being inseparable from sand will be sold along with it.
- ✓ Plantation will be undertaken in the 20720 square metres of area within mining Contract area but which falls outside the river corridor and can be used for plantation (plate 3).
- ✓ The Yamuna River when in spate rises about two metres in the area and there are no places along bank which needs to be protected with check dams.



**Figure 14: Proposed production and Total material handling in first Year.**



**MINING PLAN- Kedarpur-I (Yamuna River) Quarry,**  
M/s Akhilesh Enterprises, Paonta Sahib, Sirmaur.

**4.2b Production of the Second Year:**

- ✓ Mining of 78530 cubic metres materials is proposed to be mined from 78530 sq meter of safe zone area in the lease area of 124100 square metres.
  - 74210 metric tons of Boulder and 56540 metric tons of Bajri will be produced which will be sold in the market.
  - 42405 metric tons of sand will be produced and sold in open market depending upon demand.
  - 3535 metric tons of silt and clay present as associated minerals being inseparable from sand will be sold along with it.
- ✓ Plantation will be undertaken in the 20720 square metres of area within mining Contract area but which falls outside the river corridor and can be used for plantation (plate 3).
- ✓ The Yamuna River when in spate rises about two metres in the area and there are no places along bank which needs to be protected with check dams.

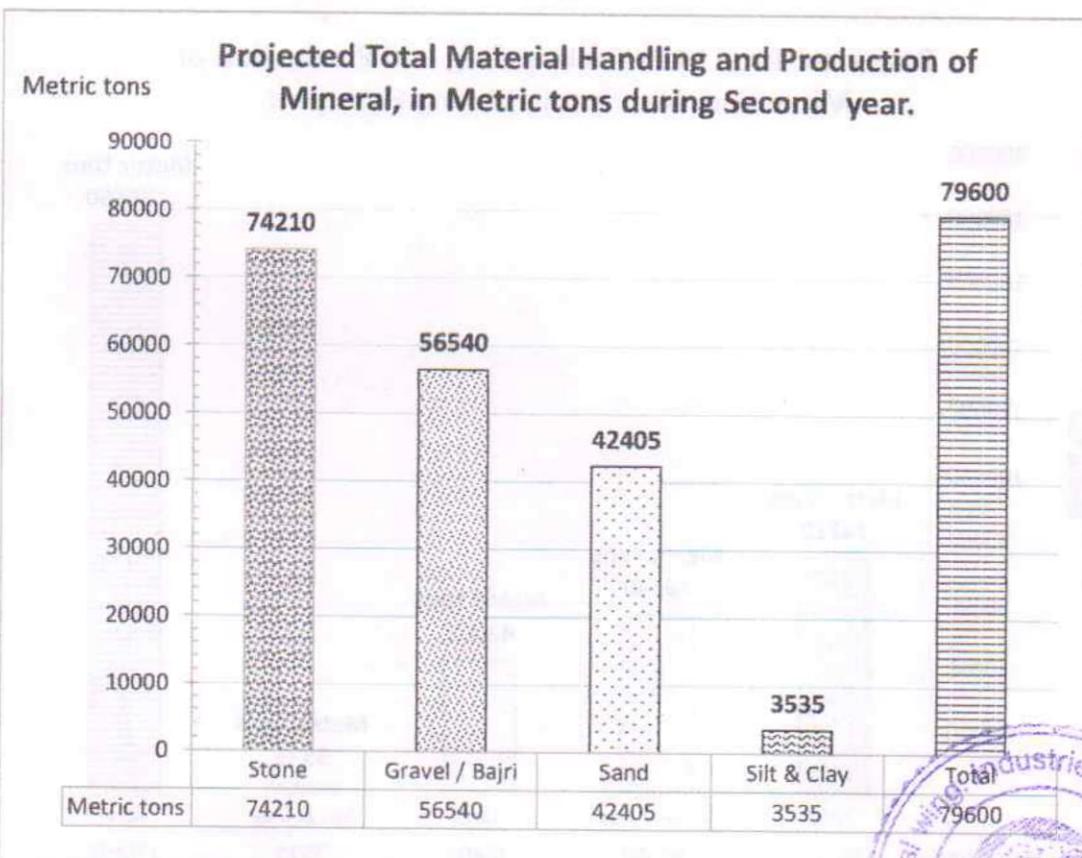


Figure 15:Proposed production and Total material of the Second Year.

#### 4.2c Production of the Third Year.

- ✓ Mining of 78530 cubic metres materials is proposed to be mined from 78530 sq meter of safe zone area in the lease area of 124100 square metres.
- 74210 metric tons of Boulder and 56540 metric tons of Bajri will be produced which will be sold in the market.
- 42405 metric tons of sand will be produced and sold in open market depending upon demand.
- 3535 metric tons of silt and clay present as associated minerals being inseparable from sand will be sold along with it.
- ✓ Plantation will be undertaken in the 20720 square metres of area within mining Contract area but which falls outside the river corridor and can be used for plantation (plate 3).
- ✓ The Yamuna River when in spate rises about two metres in the area and there are no places along bank which needs to be protected with check dams.

#### Projected Total Material Handling and Production of Mineral, in Metric tons, during Third year.

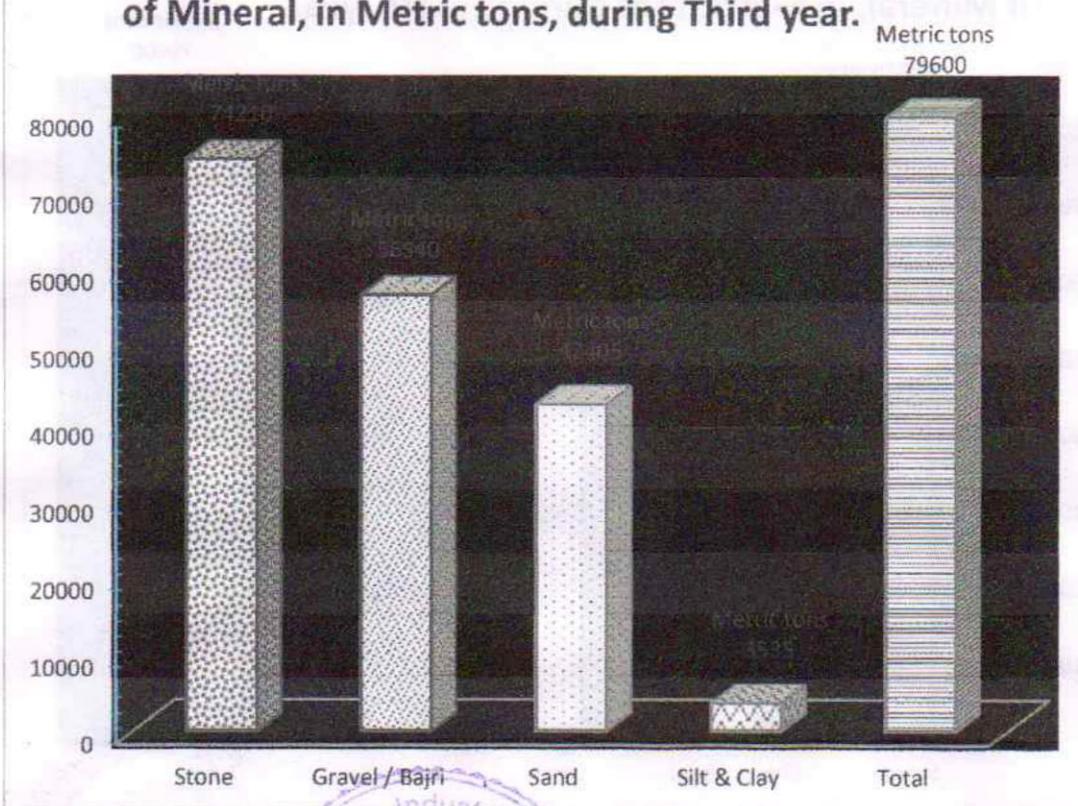


Figure 16: Proposed production and Total material of the 3rd Year.



#### 4.2d Production of the Fourth Year

- ✓ Mining of 78530 cubic metres materials is proposed to be mined from 78530 square meter of safe zone area in the lease area of 124100 square metres.
  - 74210 metric tons of Boulder and 56540 metric tons of Bajri will be produced which will be sold in the market.
  - 42405 metric tons of sand will be produced and sold in open market depending upon demand.
  - 3535 metric tons of silt and clay present as associated minerals being inseparable from sand will be sold along with it.
- ✓ Plantation will be undertaken in the 20720 square metres of area within mining contract area but which falls outside the river corridor and can be used for plantation (plate 3).
- ✓ The Yamuna River when in spate rises about two metres in the area and there are no places along bank which needs to be protected with check dams.

#### Projected Total Material Handling and Production of Mineral, in Metric tons during Fourth year.

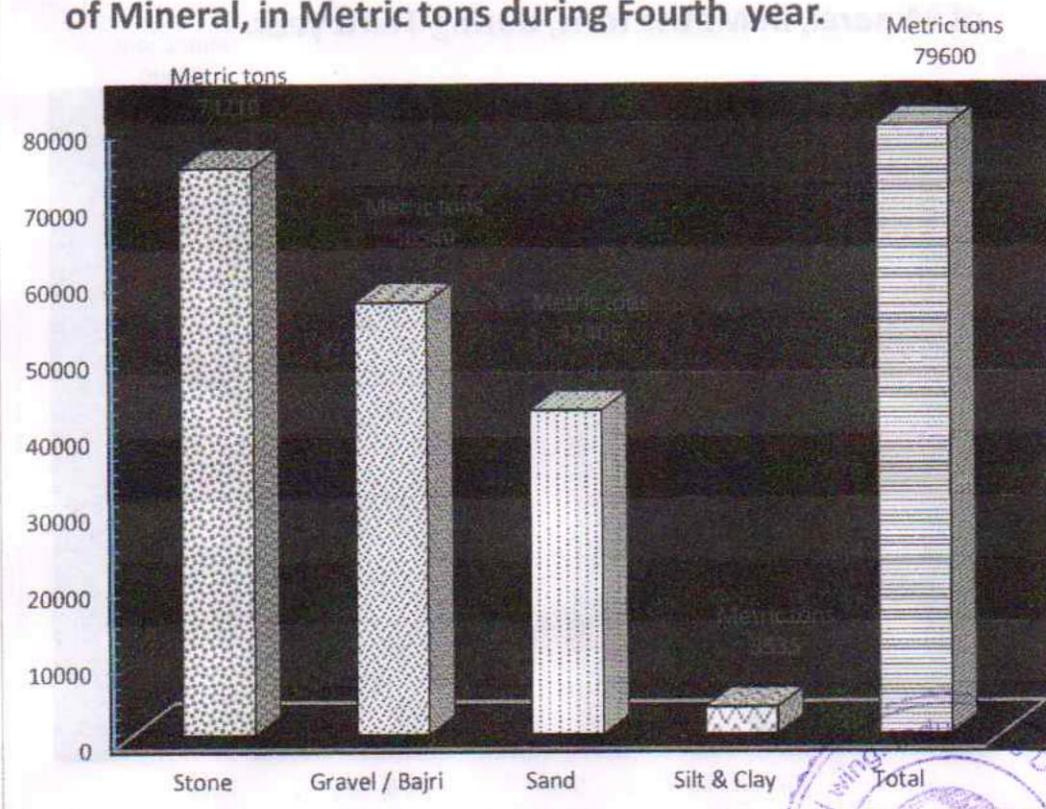


Figure 17: Proposed production and Total material of the 4th Year.



#### 4.2e Production of the Fifth Year

- ✓ Mining of 78530 cubic metres materials is proposed to be mined from 78530 sq meter of safe zone area in the lease area of 124100 square metres.
  - 74210 metric tons of Boulder and 56540 metric tons of Bajri will be produced which will be sold in the market.
  - 42405 metric tons of sand will be produced and sold in open market depending upon demand.
  - 3535 metric tons of silt and clay present as associated minerals being inseparable from sand will be sold along with it.
- ✓ Plantation will be undertaken in the 20720 square metres of area within mining Contract area but which falls outside the river corridor and can be used for plantation (plate 3).
- ✓ The Yamuna River when in spate rises about two metres in the area and there are no places along bank which needs to be protected with check dams.

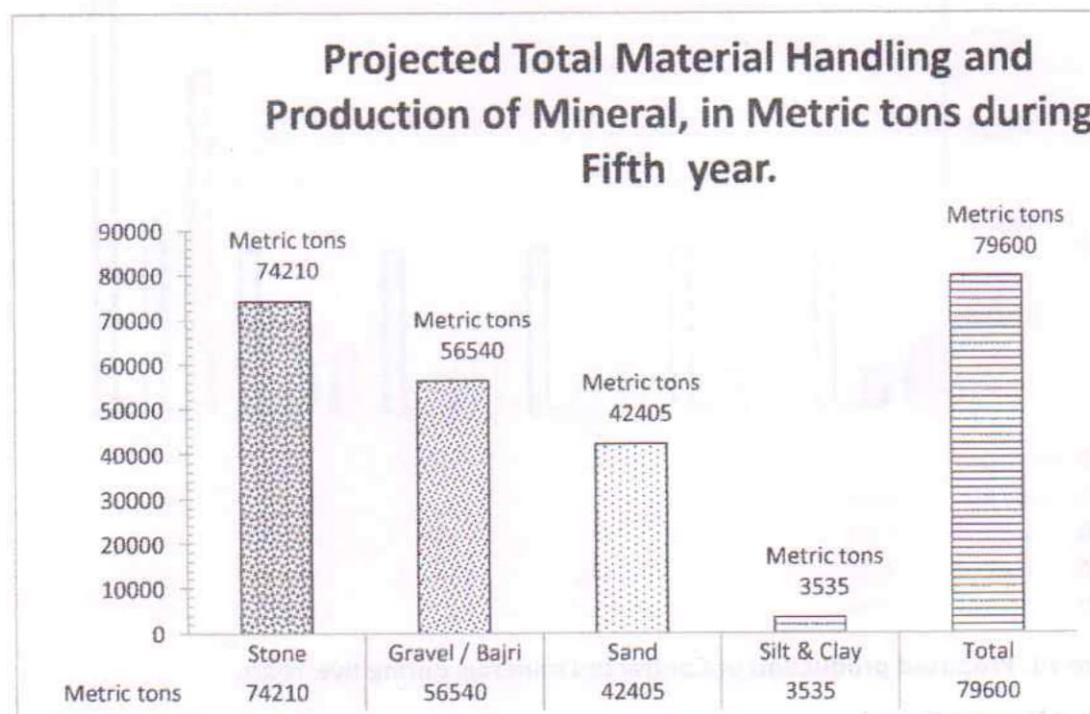
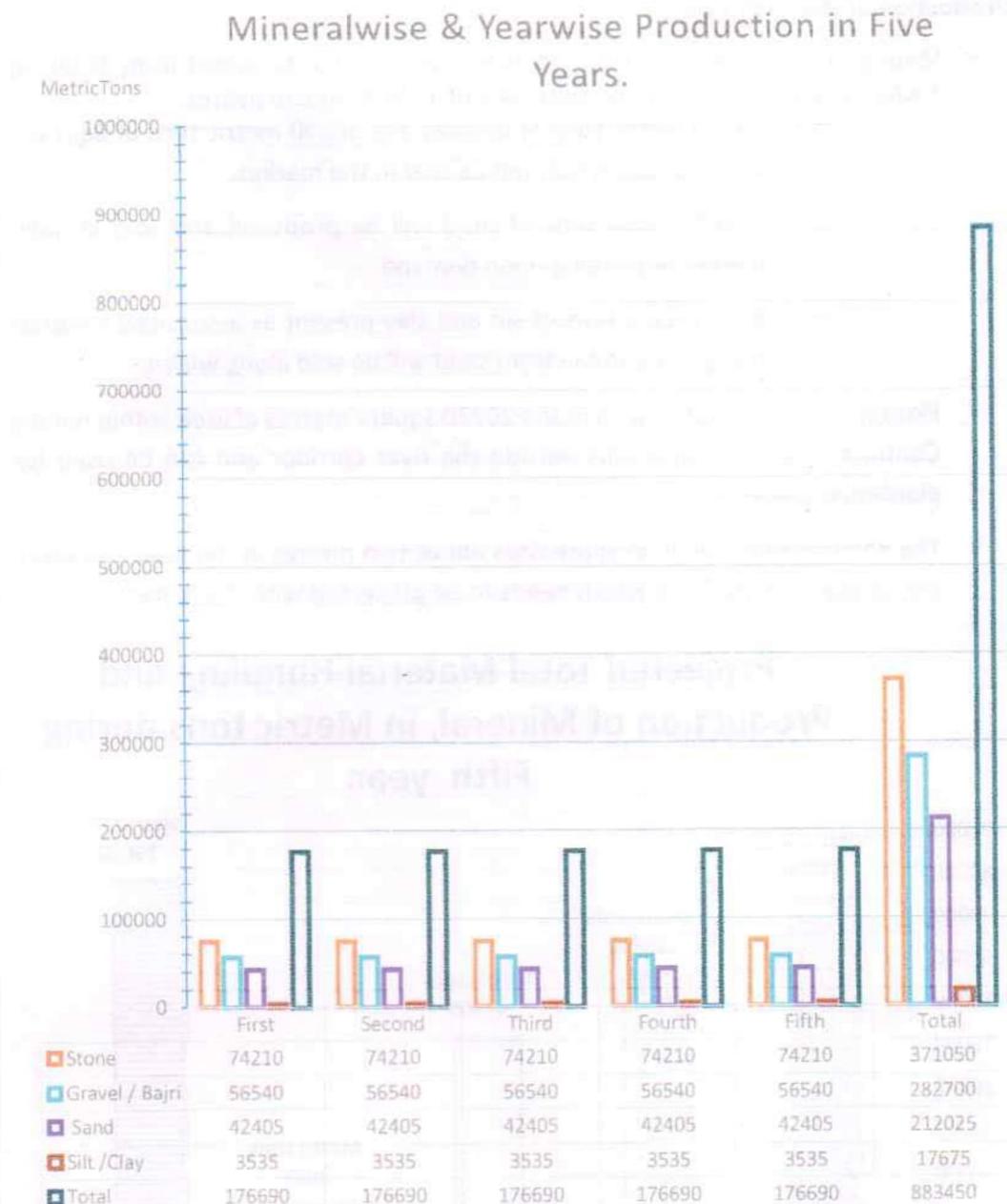


Figure 18: Proposed production and Total material of the 5th Year.

The total production of all category of river bed material for five year is shown below in the figure 19.



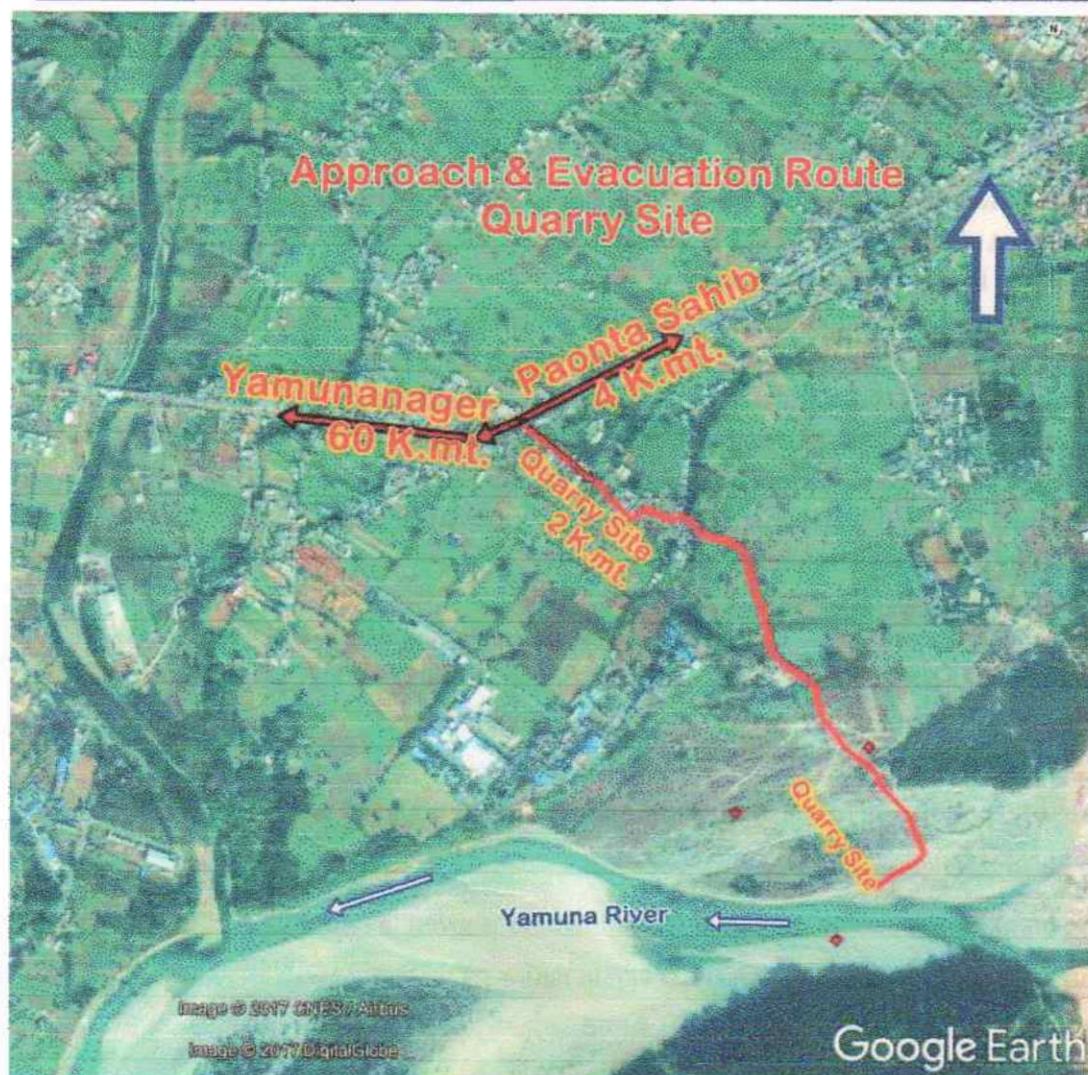


**Figure 19: Proposed production of Contracted minerals during five Years.**

#### 4.3 End Use of Mineral

The extracted mineral stone, Bajri and sand along with inseparable silt and clay is given in Figure 19. The mineral constituents are commercially marketable. The Contract being auction contract the material will be openly sold in the market as per market demand.





**Figure 20 Evacuation route from quarry.**

#### 4.4 Detail of road Transport.

The mining Contract area is part of Yamuna River near Paonta Sahib Town. From the quarry site to the river bank a track can be maintained as it is almost flat terrain. From river bank a Rural road exist leading to NH 7 as shown in figure 20.



## PART II

### ENVIRONMENTAL MANAGEMENT

#### 1. BASE LINE DATA

The base line information of the existing environment was collected from various sources such as

- ✓ Census Department, Government of India.
- ✓ Department of Economics and Statistics, Government of Himachal Pradesh.
- ✓ Directorate of Land Records, Government of Himachal Pradesh
- ✓ Directorate of Horticulture, Government of Himachal Pradesh
- ✓ Fishery Department, Government of Himachal Pradesh
- ✓ Forest Department, Government of Himachal Pradesh
- ✓ Animal Husbandry Department, Government of Himachal Pradesh
- ✓ Survey of India, Government of India
- ✓ Metrological Department Government of India

to have in depth understanding of the existing environment and to assess the likely impact of mining activity in the Area

#### Detail of Population Distribution

The total population of the surrounding villages, as per the 2011 Census is given below in the figure -21

The break of population, per gainful employment is given in figure 22.

The population breakup of Tehsil is given in figure 23.



POPULATION OF VILLAGES AROUND THE MINING LEASE  
Area under influence of Kedarpur-I Quarry

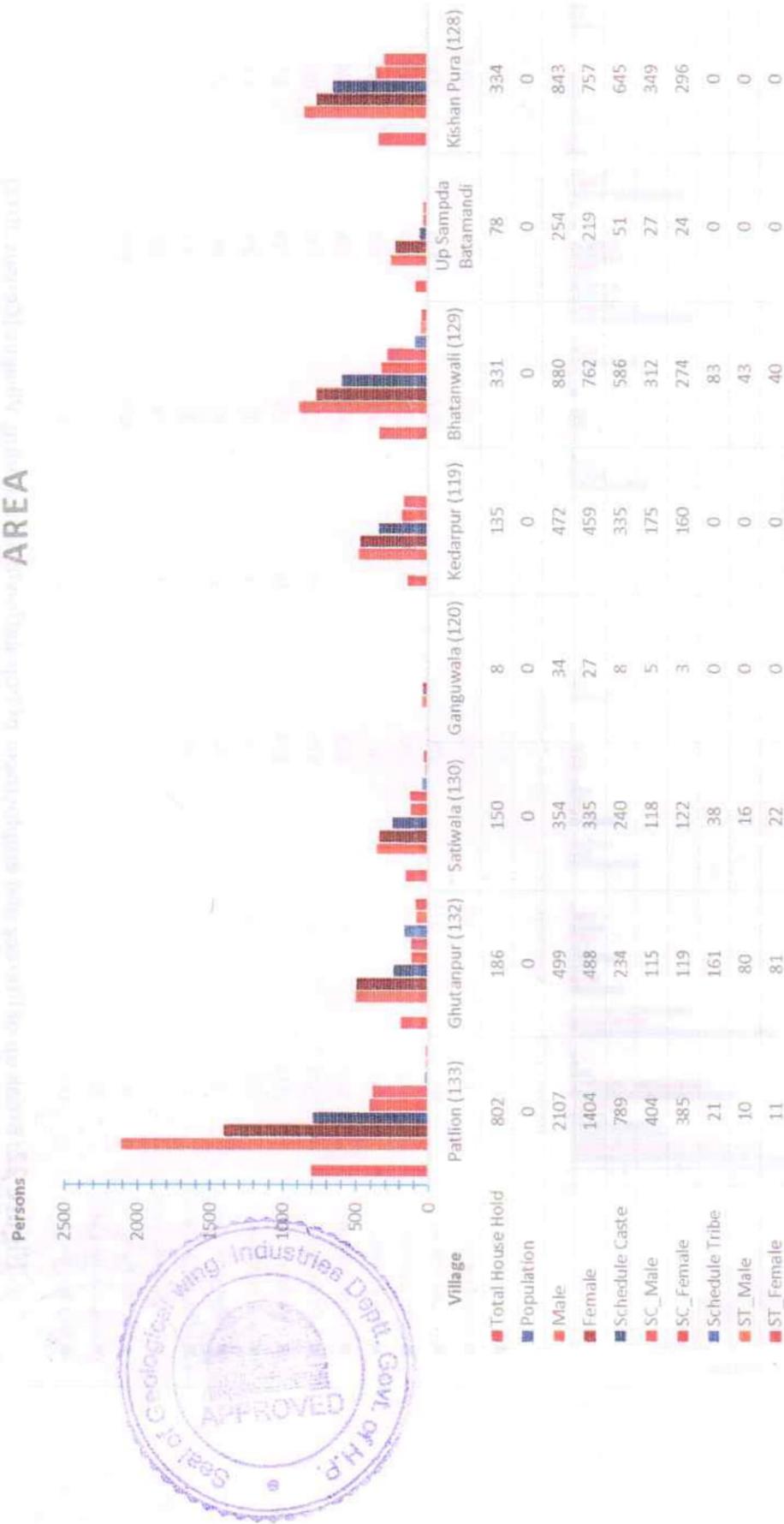


Figure 21:- Population of Villages in the Zone of Influence. (CENSUS 2011)

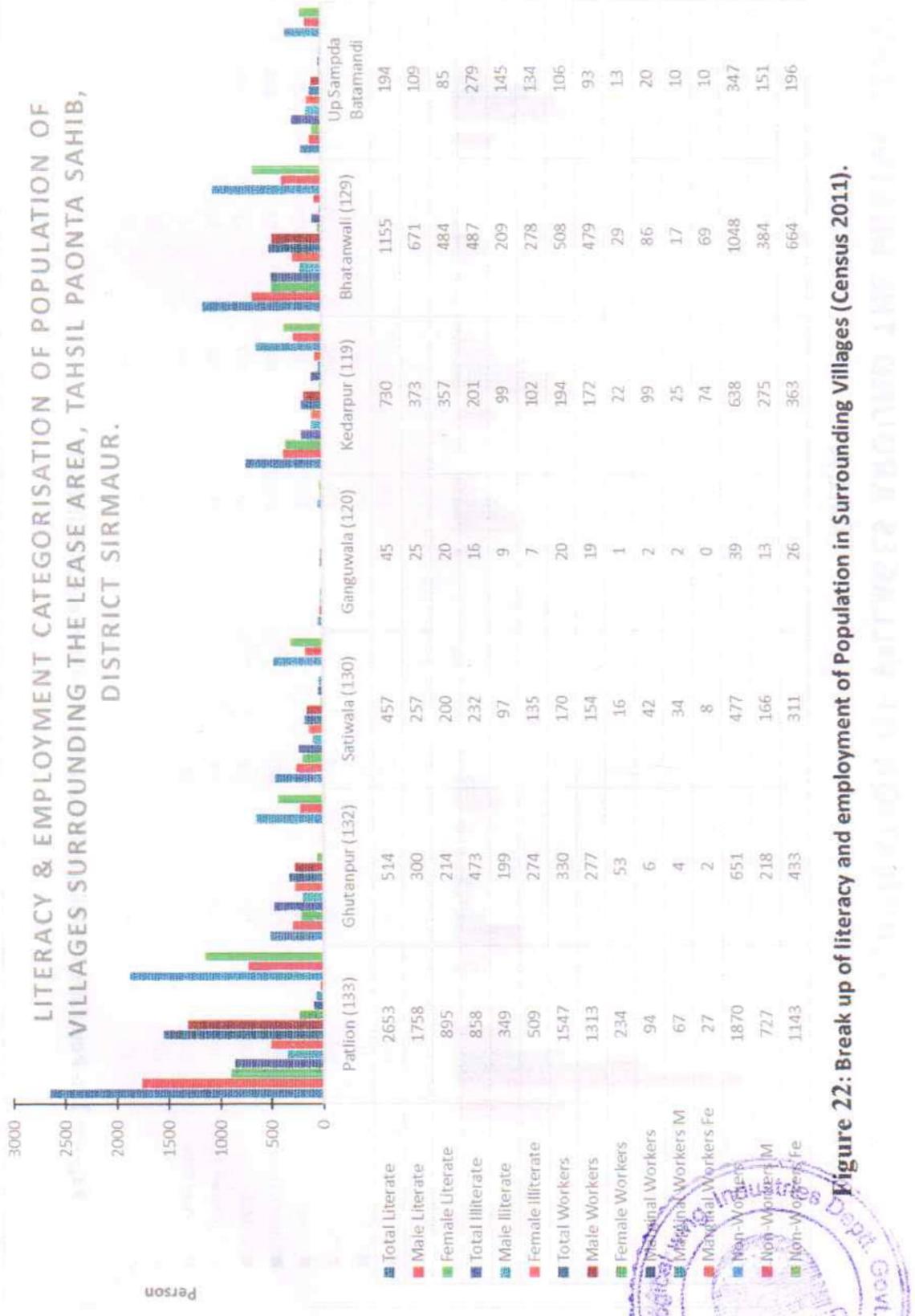


Figure 22: Break up of literacy and employment of Population in Surrounding Villages (Census 2011).

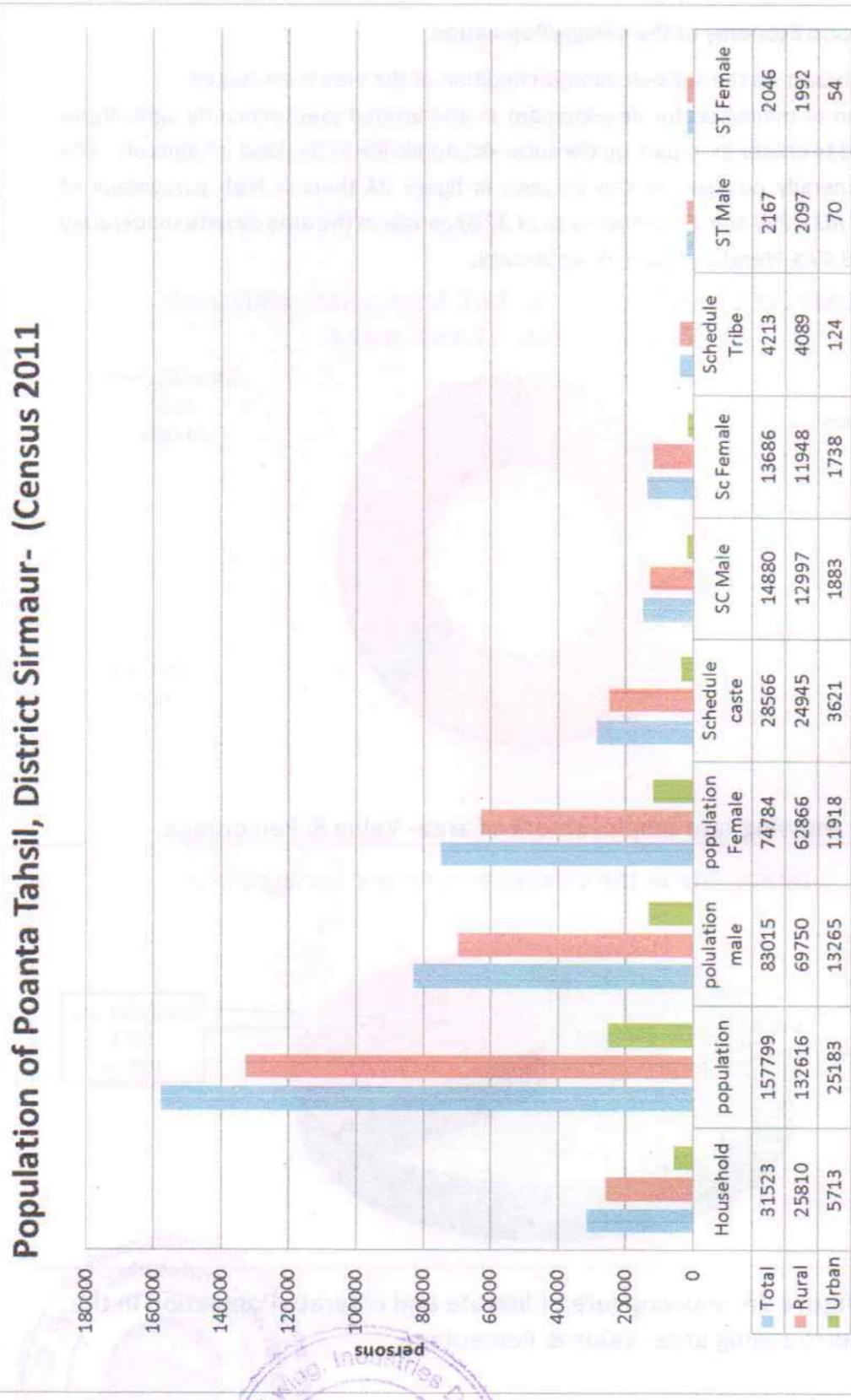


Figure 23: Population break up of Tehsil Poanta Sahib (Census 2011).

## 1.2 Socio Economy of the Village/Population

No adverse impact on the socio-economic condition of the area is envisaged.

The induction of mining sector development in and around predominantly agricultural area is bound to create its impact on the socio-economic life of the local inhabitants. The impact is generally positive. As can be seen in figure 24 there is high percentage of *unemployed* (61.82%) and *underemployed* (4.12%) people in the area despite moderately high level (69.47% literates, figure 25) of literacy.

EMPLOYMENT RATE IN THE VILLAGES AROUND  
THE MINING LEASE AREA

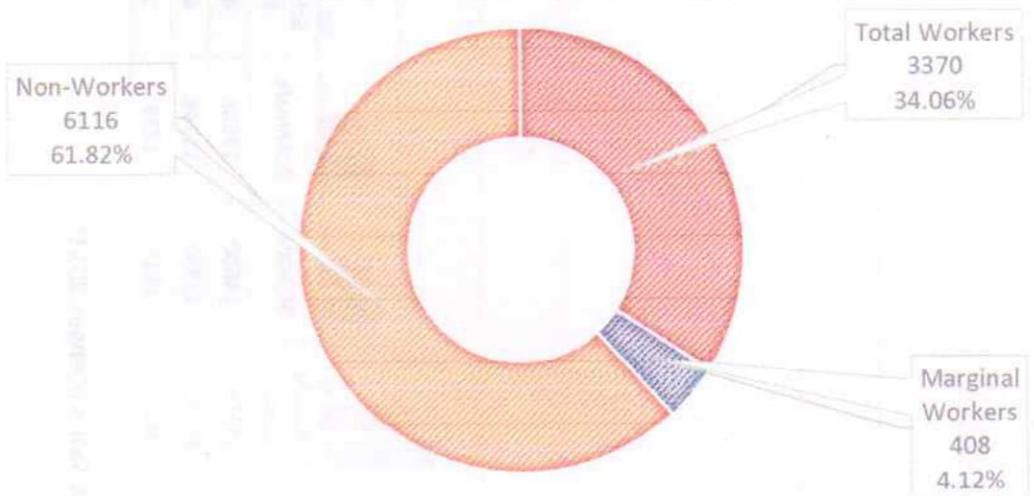


Figure 24: showing rate employment of area- Value & Percentage.

Literacy rate in the villages around the Mining Lease

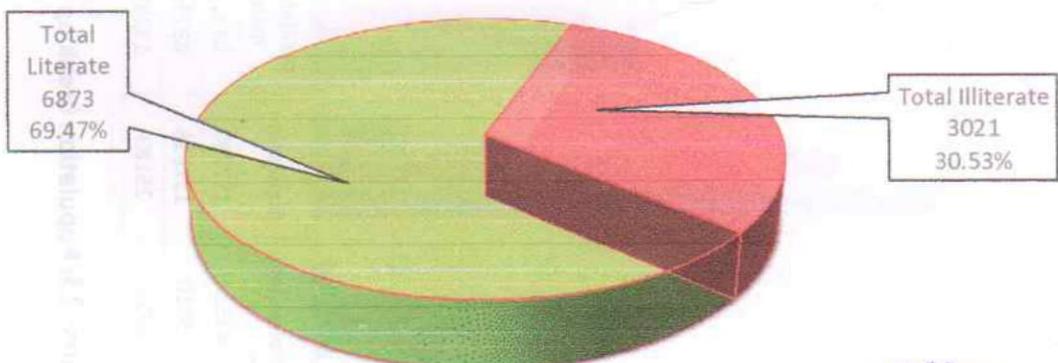


Figure 25: showing rate of literate and illiterate Population in the Surrounding area- Value & Percentage.



### 1.3 Land use Detail with map of 5 kms Radius

Primarily the land of the district can be classified in following nine categories.

S. No	Item	S. No.	Item	S. No	Item
1	Forest Area	4	Permanent Pastures and Other Grazing Land Area	7	Fallows Land other than Current Fallows Area
2	Area under Non-Agricultural Uses	5	Land Under Miscellaneous Tree Crops etc. Area	8	Current Fallows Area
3	Barren & Uncultivable Land Area	6	Culturable Waste Land Area	9	Net Area Sown

Land use map of area in five kilometres buffer zone is depicted in figure 25. The map indicates predominance of Forested area and grassy land.

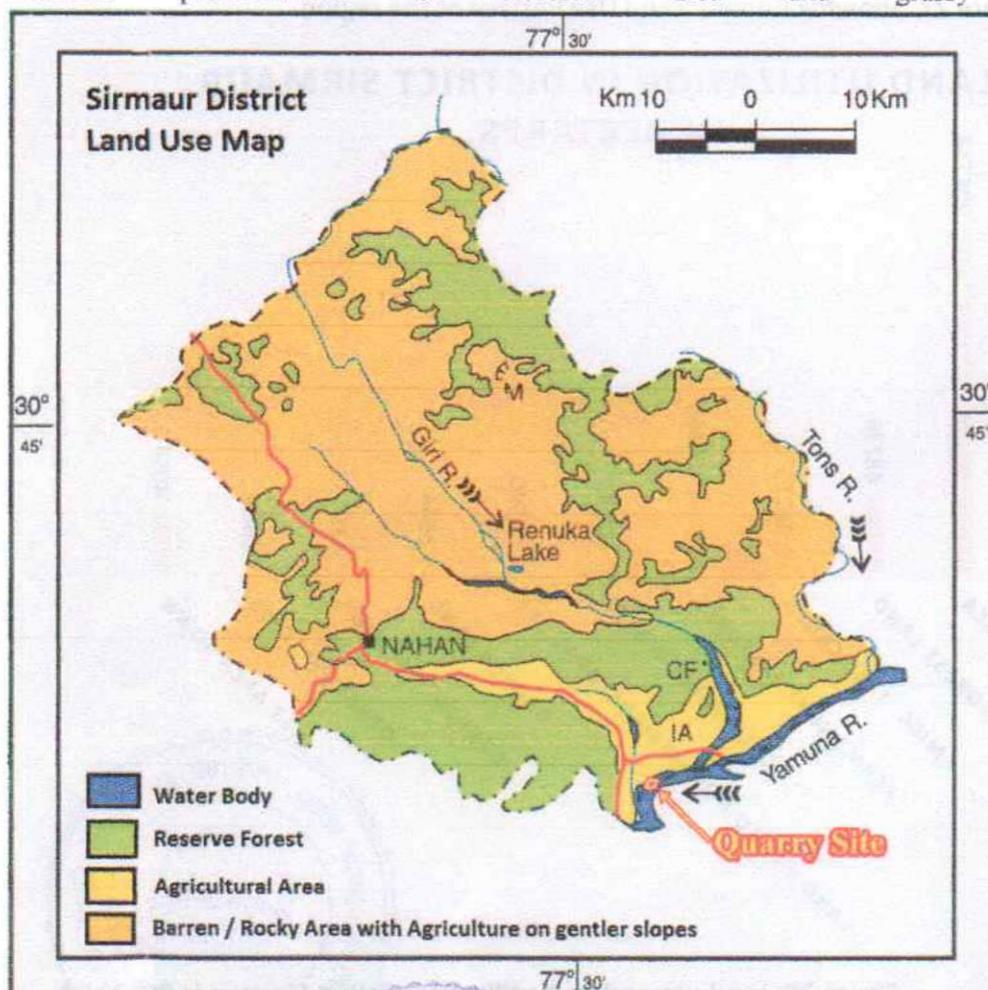


Figure 26 Land cover Map of District Sirmaur.

MINING PLAN- Kedarpur-I (Yamuna River) Quarry,  
M/s Akhilesh Enterprises, Paonta Sahib, Sirmaur.

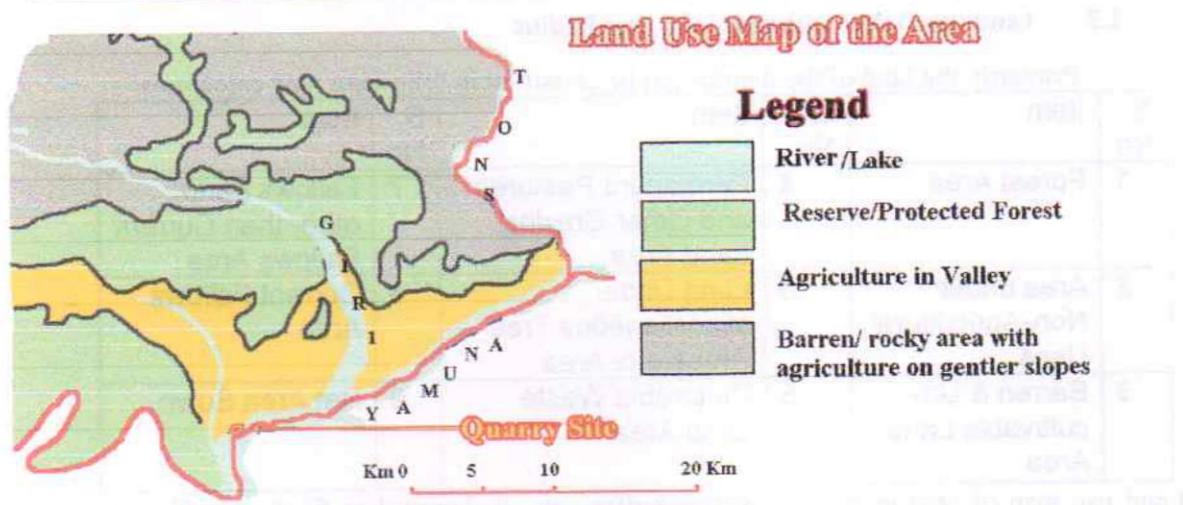


Figure 27: Showing General Land Use Pattern of the region.

**LAND UTILIZATION IN DISTRICT SIRMAUR  
IN HECTARES.**

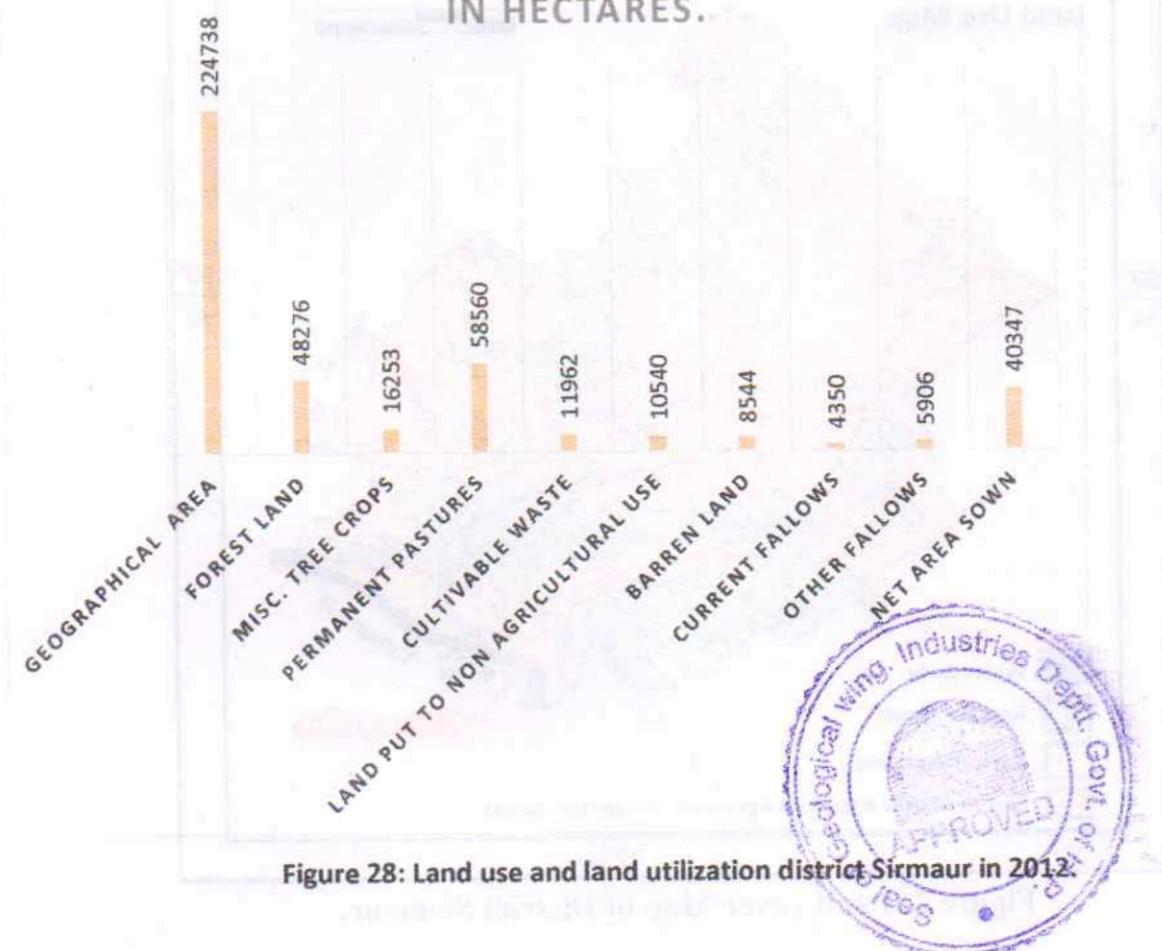


Figure 28: Land use and land utilization district Sirmaur in 2012.

MINING PLAN- Kedarpur-I (Yamuna River) Quarry,  
M/s Akhilesh Enterprises, Paonta Sahib, Sirmaur.

The District Census 2011 classified the land available in surrounding villages into following nine categories as shown in figure 29 and its percentage wise break up Tehsil is given in figure 30.

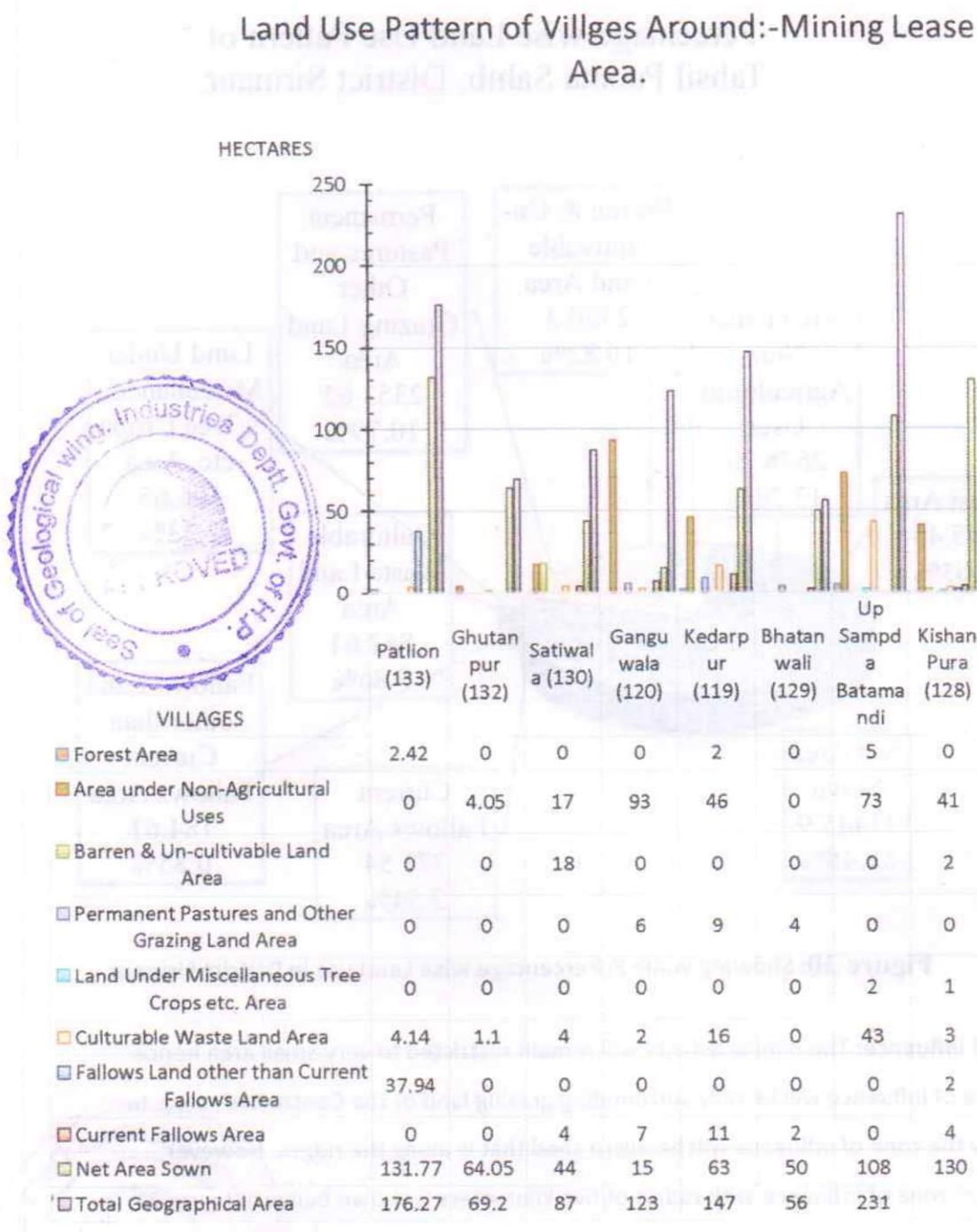


Figure 29: Land Use Pattern of Villages around the Mining Contract Area

The Contract area is situated in Poanta Tehsil; thus, the land use pattern of Tehsil Paonta Sahib is given in figure 30 shows value and percentage wise land use pattern of the Tehsil.

### Percentage wise Land Use Pattern of Tehsil Paonta Sahib; District Sirmaur.

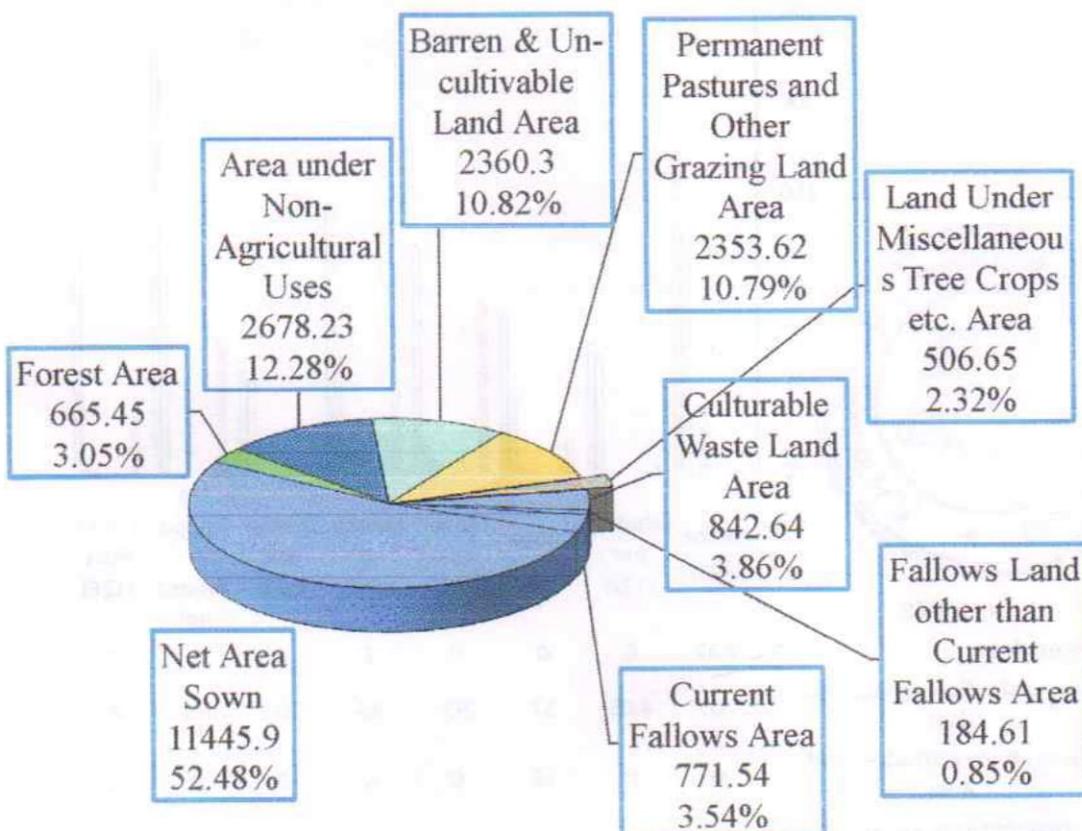
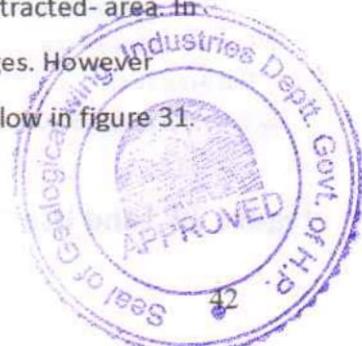


Figure 30: Showing value & Percentage wise Land use in District Sirmaur.

**Zone of influence:** The mining activity will remain restricted to very small area hence the zone of influence will be only surrounding grazing land of the Contracted- area. In the hilly the zone of influence will be micro shed that is along the ridges. However extended zone of influence with radius of five kilometers is shown below in figure 31.



**Land Use & Land Cover Map of Buffer Zone.  
Five Kilometres Radius.**

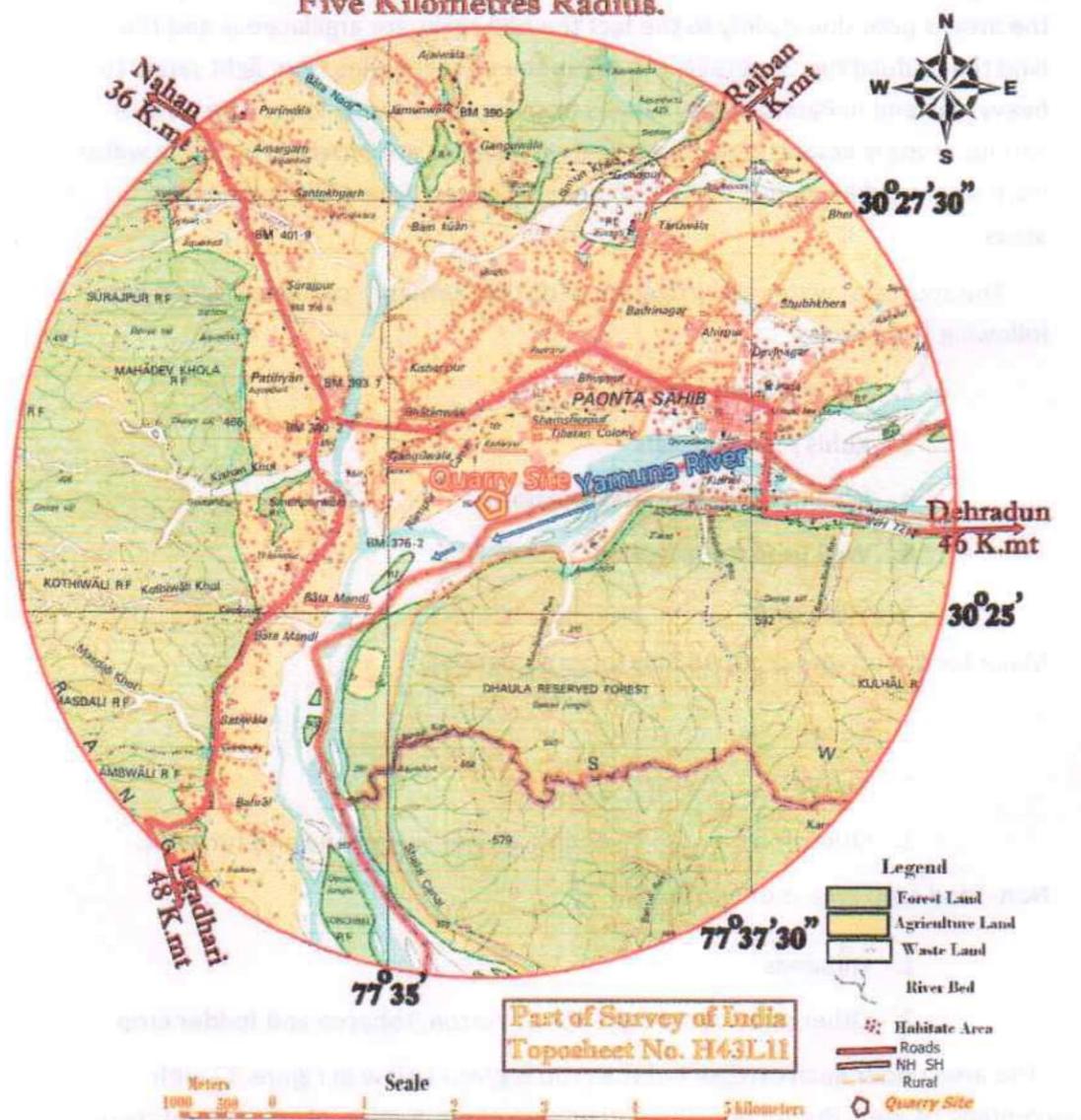


Figure 31: Land Use & Land Cover Map of the area.

**1.4 AGRICULTURE:-**

The economy of Sirmaur district is predominately agrarian and 82 percent of population is mainly dependent on agriculture and activities allied to it for earning their livelihood. Most of Paonta Valley consists of foot hills and Yamuna

**MINING PLAN- Kedarpur-I (Yamuna River) Quarry,**  
M/s Akhilesh Enterprises, Paonta Sahib, Sirmaur.

and its primary tributary valleys up to elevation of 600 metres above mean sea level with sub-tropical climate. The area is highly prone to erosion due to weak geological formations and scanty vegetation. The moisture retention capacity of the area is poor due mainly to the fact the bed rocks are argillaceous and the land is undulating. Generally, the soil in the district varies from light sandy to heavy clay and in Paonta valley ranges from sandy to sandy loam. The yield of various crops is below norm. The irrigation facilities are provided by lifting water from streams, shallow dug wells and medium - deep tube wells in the valley areas.

The source of water and irrigation in district Sirmaur can be classified into following five classes

1. Lift Irrigation Scheme
2. Kuhls / small canals.
3. Well used for domestic purposes
4. Well used for irrigation
5. Tube wells

Major food crops are grouped into three categories:

1. Cereals
2. Pulses
3. Other food crops like Chilies, ginger, sugarcane and turmeric.

Non-food crop area is of two kinds:

1. Oil seeds
2. Other non-food crops such as cotton, tobacco and fodder crop

The area under each category of the crop is given below in Figure 32 with percentage of area. Production and percentage of production of agricultural crops in district Sirmaur displayed in Figures 33. The area under vegetables & potatoes and their production is given in the Figure 34.



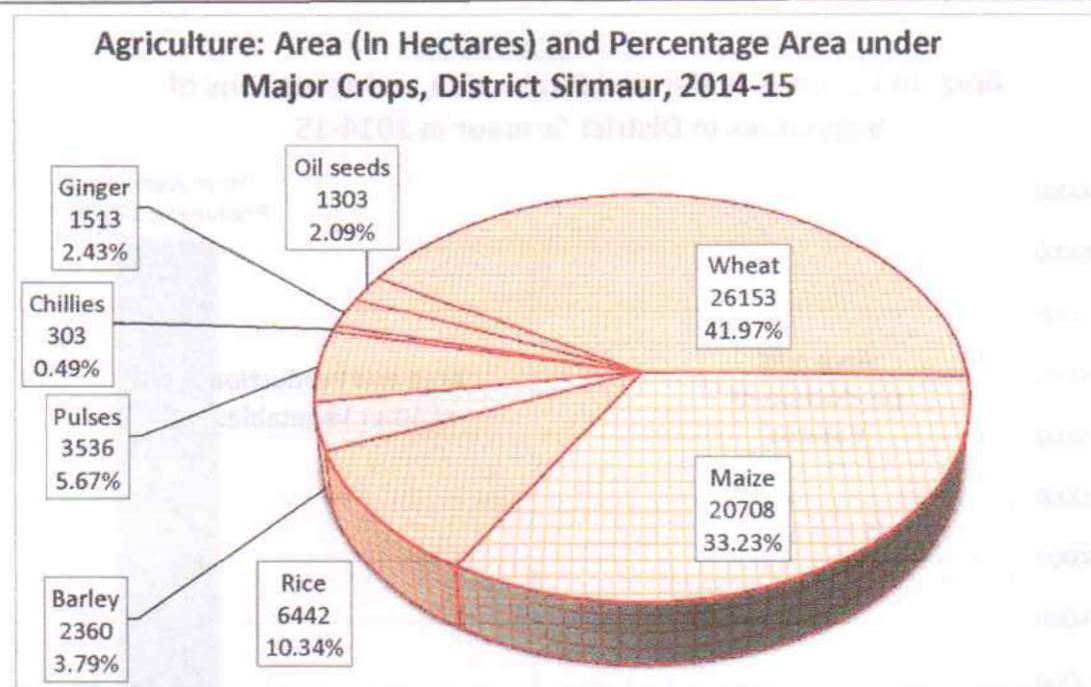


Figure 32: Showing; Percentage of area under each crop, District Sirmaur

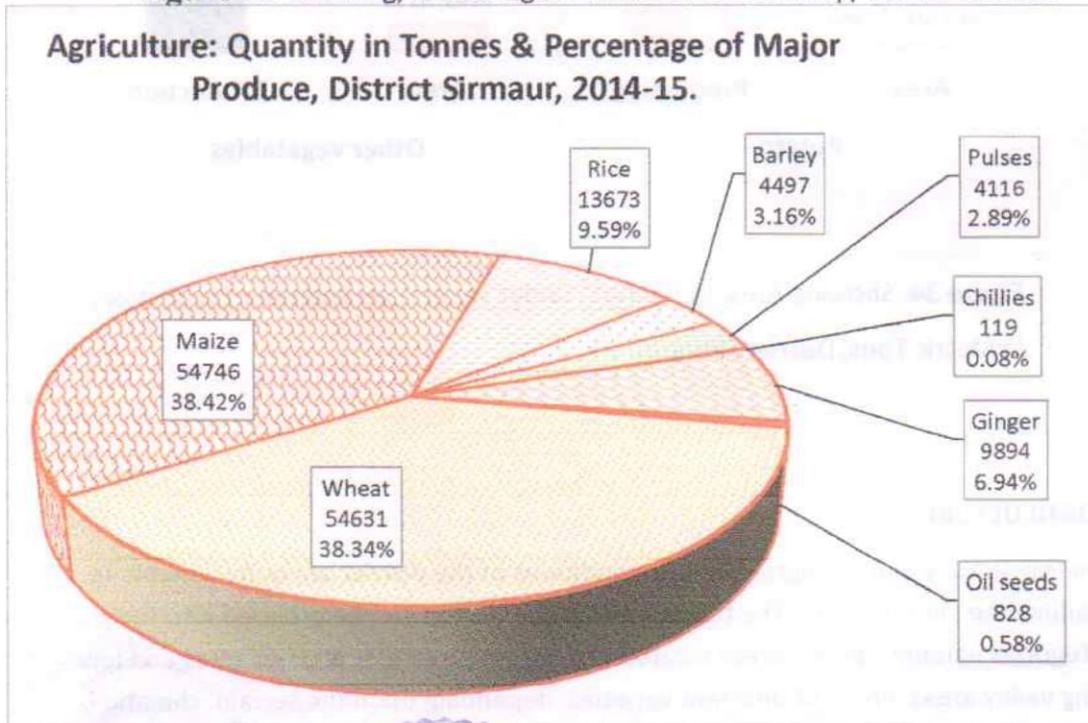
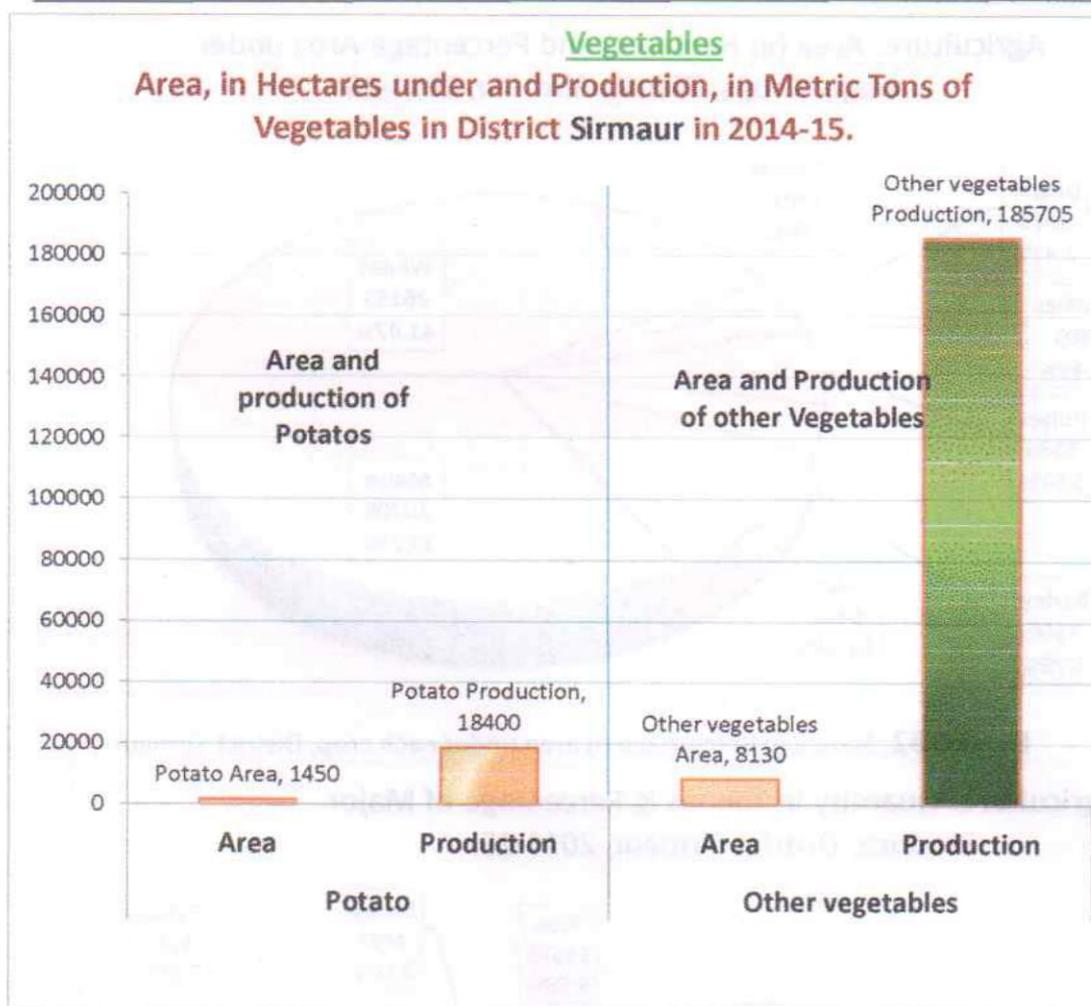


Figure 33: Showing production & Percentage Production of each crop in District Sirmaur



**Figure 34:** Showing Area, in Hectare, under vegetables and their Production, in Metric Tons, District Sirmaur.

### 1.5 HORTICULTURE: -

The topography and the agro-climatic conditions of the district are quite suitable to produce the various fruits. The topography of the district can be grouped into three categories namely high hill areas located at a higher elevation, mid hill areas and low lying valley areas. Fruits of different varieties, depending upon the terrain, climatic condition and soil are grown in the district.

The main horticulture produce of the area are can be classified into following five categories.

1. Apple



**MINING PLAN- Kedarpur-I (Yamuna River) Quarry,  
M/s Akhilesh Enterprises, Paonta Sahib, Sirmaur.**

2. Other temperate fruits
3. Subtropical fruits
4. Nuts and dry fruits
5. Citrus fruits

In the Poanta valley following fruits are mainly grown

- i. Mango
- ii. Litchi
- iii. Mandarin
- iv. Sweet orange
- v. Lime
- vi. Lemon
- vii. Guava

The area under each fruit and their production in District Sirmaur is given in the Table 8 as per 2014-15 survey.

**Table 5: Area under each fruit and their annual production, District Sirmaur.**

District Sirmaur		
Status of Horticulture 2014-15.		
Fruit	Area (In Hectares)	Production (In Metric Tons)
<b>Apple</b>	<b>2912</b>	<b>2290</b>
Plum	1358	911
Peach	2988	2292
Apricot	570	802
Pear	412	402
Cherry	0	0
Kiwi	2	16
Olive	1	0
Persimmon	1	2
Strawberry	38	548
<b>OTF</b>	<b>5370</b>	<b>4973</b>
Almonds	110	65
Walnut	1126	648
Piccanut	7	1
<b>Nuts &amp; Dry Fruits</b>	<b>1243</b>	<b>714</b>
Orange	383	285
Malta	12	57
K. Lime	1142	1241

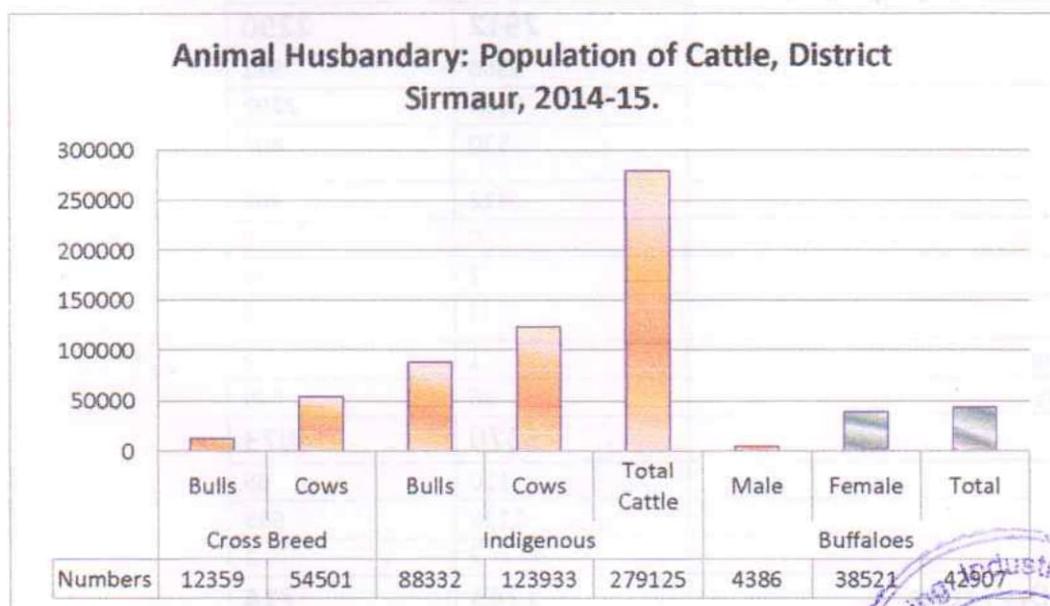
MINING PLAN- Kedarpur-I (Yamuna River) Quarry,  
M/s Akhilesh Enterprises, Paonta Sahib, Sirmaur.

Galgal	154	254
Others	6	26
<b>Citrus</b>	<b>1697</b>	<b>1863</b>
Mango	2804	1148
Litchi	101	112
Guava	115	147
Aonala	154	147
Pomegranate	244	330
Jackfruit	38	151
Papaya	8	0
<b>OSTF</b>	<b>3464</b>	<b>2035</b>

### 1.6 Animal Husbandry

Economy of the district is predominantly agrarian therefore, the role of Animal Husbandry is very important as the farmers must keep the cattle for ploughing and to obtain manure for maintaining fertility of the fields and to meet daily need of milk of their family.

The total population of the livestock in District Sirmaur is given in the figure 35. The population of the Buffaloes and Cattle in District Sirmaur is given in the figure 36.



**Figure 35: Livestock population of District Sirmaur.**



### Animal Husbandry: Population of Livestock, District Sirmaur, 201415.

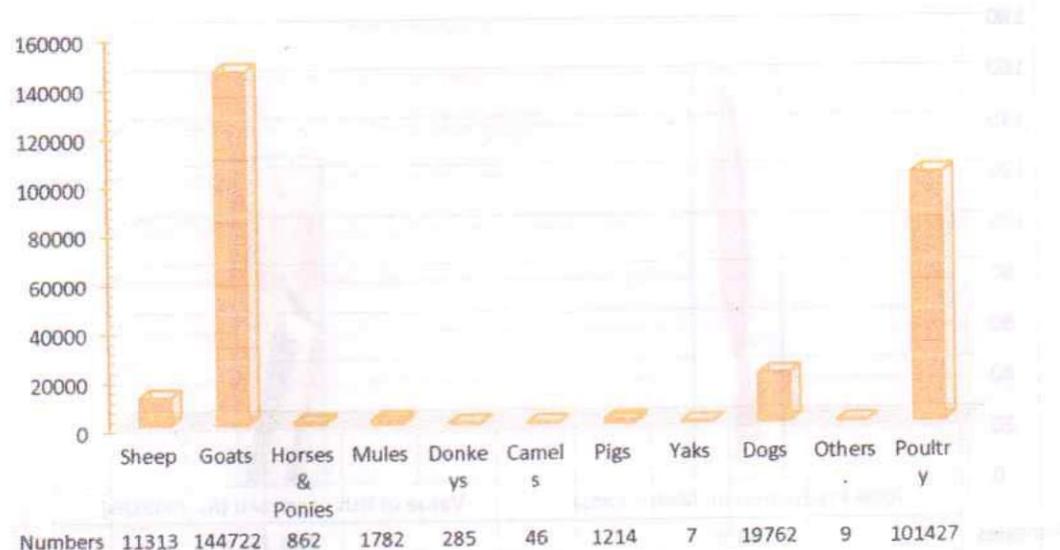


Figure 36: Showing Population of Cattle & Buffaloes in District Sirmaur.

### 1.7 Fisheries

The district is bestowed with some perennial rivers/streams spread over in 284 kms of length which includes big rivers like the Yamuna, the Giri and the small streams like Bata, Jalal, Nera and Markanda. Following variety of fish are found in these rivers:-

**Mahaseer ( Tor-putitora)**

**Bata**

**Gid**

**Labeo-doro**

**Gungli ( Schiozothorax plagiostomus)**

**Gooch**

**Mirror Carp**

The yield of fish has increased in the district considerable as shown in figure 37.

### Fisheries: Annual Production and value of catch, District Sirmaur, 2014-15.

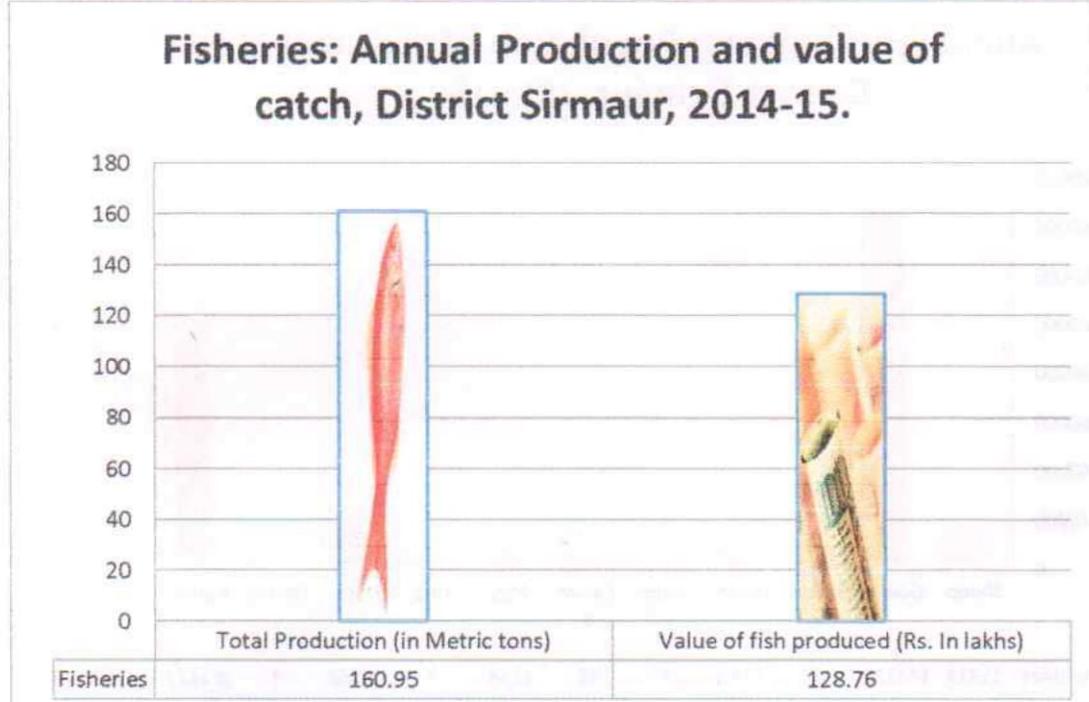


Figure 37: Showing Production and value Fish in 2013-14, District Sirmaur.

As the mining activity is to be confined to the dry bed no fishing spot near the Contract area is likely to be effected by mining operation.

## 1.8 Flora and Fauna

### 1.8a Flora

The Chil is considered the prevailing conifer up to about 1950 meter when it gives place to the Deodar and the blue pines. In Sirmaur district the forest range between scrub, sal and bamboo forest of the low hills to the fur and alpine forests of the higher elevation. Lowest point of the shern boundary of the district is less than 300 meter above sea level and highest range of is at more than elevation of 3000 meters in the north East. The forests grown between these two extremes vary as the elevation itself.

In the area under consideration following are the most common trees



The most prominent varieties of trees found in the area are

Simbal (*Bombax malabaricum*),

Mango (*Magnifera indica*)

Tun (*Cedrela toona*)

Several species of acacia and albizia

Salambra (*Odina wodier*)

Termnalia

Jamun (*Engenia jambolana*)

Larger tour

Bamboo

#### Shrubs

The most common shrub at the higher elevation is Barberis,

indigopera and Desmodium and following other shrubs are also found

1. Vitex
2. Munj
3. Ber
4. Ipomea
5. Dodonea &
6. Bamboo

#### 1.8b Fauna

**Animals:** Due to wide variations in the attitude a large variety of fauna is available in the forests of the district. The black bears are common in the higher valley. The leopards are found through the district. Barking dears and gural are found at medium elevation the musk deer or Kastura and serao are found in certain areas. Most commonly found is the porcupine, which is found in almost in the entire District. Common Mammals & Birds in the Sirmaur District is given in the Table 7.

Table 6: Common mammals in the Sirmaur District.

Zoological Name	English Name	Common Name
<i>Felis bengalensis</i>	Leopard Cat	Mirag, Bagh
<i>Felis Chane</i>	Jungle Cat	Jangli Billi
<i>Muntucus muntisk</i>	Barking Dear	Kakkar
<i>Vulpes bengalensis</i>	Fox	Lomari, Fohiki
<i>Canis aureus</i>	Jackal	Gidder
<i>Macaca mulatta</i>	Ressus monkey	Lal Bander
<i>Presbytis entellus</i>	Languor	Languor
<i>Sus scrofa</i>	Boar	Suar
<i>Hystrix indica</i>	Porcupine	Sehal
<i>Lepus nigricollis</i>	Hare	Khargosh, Sherru, farru
<i>Moschus moschiferus</i>	Musk deer	Kastura
<i>Capra ibex</i> Ibex	Ibex	
<i>Hemitragus jemlahicus</i>	Himalayan Thar	Thar
<i>Selenarctos thebatus</i>	Black Bear	
<i>Ursus arctos</i>	Brown Bear	
<i>Panthera unica</i>	Snow leopard	
<i>Sus scrofa</i>	Wild Boar	
<i>Axis axis</i>	Spotted deer	Chital
<i>Cervus unicolor</i>	Samber	
<i>Hylopetes fimbriatus</i>	Flying squirrel	
<i>Panthera pardus</i>	Leopard	Cheetah
<i>Felis chaus</i>	Jungle cat	
<i>Paradoxurus hermaphroditus</i>	Indian Civet	Sakralu
	The great Himalayan leafnosed Bat	
<i>Hipposideros armiger</i>	leafnosed Bat	Chamgadar



MINING PLAN- Kedarpur-I (Yamuna River) Quarry,  
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<i>Paguma larvata</i>	Himalayan Palm Civet	
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**Table 7: Common Birds of the Sirmaur District**

<b>Birds</b>		
<b>Zoological Name</b>	<b>English Name</b>	<b>Common Name</b>
<i>Milvus migrans</i>	Vulture	Cheel, Gidh, Eell
<i>Eudynamys scolopacca</i>	Koel	Koel
<i>Columba livia</i>	Pigeon	Kabuttar
<i>Coracias bengalensis</i>	Blue jay	Nilkantha
<i>Columba livia</i>	Hawk	Baj
<i>Francolinus francolinus</i>	Black partridge	Kala Tittar
<i>Francolinus pondicerians</i>	Grey partridge	Safed Tittar
<i>Payo crissatus</i>	Peacock	Mor
<i>Coturnix columnix</i>	Common quail	Bater
<i>Alectoris graeca</i>	Chakor	Chakor
<i>Croesus splendens</i>	Crow	Kanwa
<i>Prottacula Karneri</i>	Parrot	Totta
<i>Lophophorus impejanus</i>	Monal	Monal / Karadi
<i>Tertaogallus himalayanensis</i>	Snow cock	
<i>Tragopan melanocephalus</i>	Western horned Tragopan	Phulgar/Jujurana
<i>Picoides macei</i>	Fulvourbreasted Pied Woodpecker	Kathfowra
<i>Streptopelia decaocto</i>	Ring dove	Gughi
<i>Streptopelia chinesis</i>	Spotted dove	Gughi
<i>Accipiter badius</i>	Shikra	
<i>Aquila rapax vindhian</i>	Tawny eagle	

**MINING PLAN- Kedarpur-I (Yamuna River) Quarry,  
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<i>Ducula bicolor</i>	Green Pigeon	
<i>Parus rufonuchalis</i>	Tits	
<i>Picus canus</i>	Black napped Woodpecker	Woodpecker
<i>Dryocopus javensis</i>	Woodpecker	
<i>Muscicapa subruba</i>	Himalayan Fly Catcher	
<i>Acidotheres tristis</i>	Common Myna	Ghatari
<i>Terpsiphone paradisi</i>	Paradise flycatcher	Choti- Pinja
<i>Grus spp.</i>	Cranes	
<i>Grus antigone</i>	Sarus Crane	Saras
<i>Passer domesticus</i>	House sparrow	
<i>Carduelis spinoides</i>	Himalayan Green Finch	Chiria

**In the Contracted area and surrounding hills following are the common**

**animals:-**

- Leopard (Bagher)
- Hare
- Wild Bore (Jangli Soor)
- Jackal
- Barking Deer (Kakkar)
- Monkey
- Sambar
- Pig
- Chakor
- Crow
- Red Jungle Fowl (Jangli Murga)
- Black Partridge ( Kala Titar)
- Grey Partridge ( Safed Titar)
- Woodpecker

**Birds**

### 1.9 Climate and Rainfall

The Climate of the Contract area can be classified into following three categories

1. Winter
2. Summer
3. Rainy



**MINING PLAN- Kedarpur-I (Yamuna River) Quarry,**  
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Rainfall varies significantly with altitude of the area. The catchment area receives rainfall due to western disturbances that pass over the north-western part of the country during winter months.

Rainy season starts from July and extends up to mid-September. During winter the rains are scarce and extends in between 15<sup>th</sup> December to 15<sup>th</sup> February.

The general temperature, rainfall and humidity corresponding to each type is given below in table 13.

Climate of Sirmaur, Himachal Pradesh				
Climate		Winter	Summer	Rainy
Period		Oct-Mid-March	Mid-March-June	July-September
Weather		Cool	Hot	Humid
Humidity		84%	55%	98%
Temperature	Max	26.0 °C	34.4 °C	28.0 °C
	Min	4.9°C	15.0°C	17.0°C
Rainfall	Max	82.0 mm	69.0 mm	175.0 mm
	Min	1.0 mm	1.0 mm	1.0 mm

## 2 ENVIRONMENT MANAGEMENT PLAN

Any development activity such as mining is likely to have beneficial as well as adverse impact on existing environment on following parameters:

- Change in Topography and Land Use Pattern
- Climate
- Air Quality,
- Noise level and Ground vibrations,
- Flora & Fauna
- Soils
- Water Resources and Quality,



- Drainage,
- Socio- economic conditions

## 2.1 CHANGE IN TOPOGRAPHY & LAND USE PATTERN.

### IMPACT & MITIGATION

- The Contract area is part of foot hills of Himalayas.
- It is part of a River bed.
- The highest point of the Contract area is at 399 metre above mean sea level.
- The lowest point is at 397 m above MSL.
- Mine Area is compact one block.
- The entire block is rested during monsoons for replenishment.
- The mining shall be confined to well within the river bed corridor.
- No mining near the banks up to 1/10<sup>th</sup> of its width can be undertaken as per guidelines, i.e. 15 to 20 metres, from banks.
- Mining shall be undertaken to a depth of one metre only.
- The Contract area is and shall remain river bed.
- Thus, the topography or land use of the River bed *per se* will not be changed.
- The mining Contract area is devoid of any vegetation.
- The land use of the mining Contract area is defined in the Revenue record as 'Gair Mumkin Beed'.
- The land under active mining would always remain river bed, during as well as post mining.

## 2.2 EFFECT ON CLIMATE

- The mining Contract area is very small, only 2.0570 hectares.
- The mining will be confined to, within the river banks.
- The mining will be restrained to top one metre.



- Some micro level impact near the freshly exposed surface may happen for short duration as some humid material may be exposed
- The impact will need no mitigating measures.

### 2.3 Impact on air

- No blasting material is to be used.
- The major contributors of air pollution in open cast mining are excavation, loading and transportation, generating dust, which leads to momentary rise in the suspended particulate matter (SPM).
- The mining activity will be limited to excavation of about 295 metric tons of stone, bajri, and of sand with silt for free sale per day.
- Four tipper trucks will be able to move the required stone and bajri from mine to market which is within 10-kilometer radius from the mine, in about 33 truck trips depending upon market requirement.
- This activity would generate negligible disturbance to air quality.

### 2.4 NOISE POLLUTION

#### IMPACT

- The mining area represents calm surroundings.
- The mining shall be manual causing hardly any noise.
- The noise would be generated by the movement of trucks / tractor trolleys engaged in the transportation of the mined material.
- About nine trucks trips would be required for transporting mined material per working day from mining area to crusher.

#### MITIGATION MEASURES

- The dedicated tipper truck would properly and regularly undergo maintenance to minimize noise.
- Particular care would be taken to properly maintain the silencers of the vehicles.

- No use of horn shall be allowed in or near the mining area.
- There is already vegetation along the banks which fall side the Contracted area.

#### 2.5 EFFECT ON FLORA & FAUNA

- The mining Contract area is river bed.
- There is hardly any flora or fauna on the river bed to attract any protective or mitigating measures.

#### 2.6 SOIL COVER

- The mining will be confine to River bed.
- It has no soil cover as the area gets frequently flooded during heavy rains.
- Thus, there shall be no impact on any natural soil cover.

#### 2.7 EFFECT ON HYDROLOGY

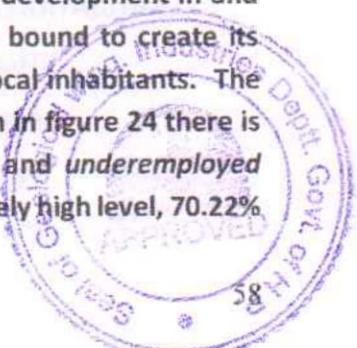
- The mining area is part of river bed.
- The mining will be restricted to top one metre of river bed.
- The mining will be confine to central part of river bed, away from banks.
- Thus, mining would be dredging the dry river bed and reducing the silt burden downstream.
- The mining will be undertaken during dry seasons.
- The ground water (undercurrent of the river) will not be disturbed

#### 2.8 Waste disposal Management

The area is in a regular course of Yamuna River and no waste will be produced during the mining activity.

#### 2.9 SOCIO- ECONOMIC IMPACT

- No adverse impact on the socio-economic condition of the area is envisaged. The induction of mining sector development in and around predominantly agricultural area is bound to create its impact on the socio-economic life of the local inhabitants. The impact is generally positive. As can be seen in figure 24 there is high percentage of *unemployed* (59.73%) and *underemployed* (6.39%) people in the area despite moderately high level, 70.22%



of literacy, (figure 25). The mining activity though with small direct employment potential but would create jobs for at least 45 persons directly and indirectly.

- However, the mining project in the area will have various positive impacts in the area. The mining project and its downstream project construction activity will provide work to as many as 45 persons. Considered their total minimum earning per day to a tune of Rs. 15750 per person (@Rs.350/- per person per day), the area will get a supplementation in its financial and social wellbeing to some effect.

#### 2.10 Transport of Mineral

The mining Contract area is part of Yamuna River near Paonta Sahib Town. From the quarry site to the river bank a track can be maintained as it is almost flat terrain. From river bank a Rural road exist leading to NH 7 as shown in figure 20. In all about 295 tonnes of material will be evacuated daily during the working season of 270 days. From National Highway material, can be transported to various places.



### PART III

#### 1 PROGRESSIVE MINE CLOSURE PLAN/RECLAMATION PLAN

##### 1.1 Reclamation

- The mined area being part of the river course cannot be reclaimed for any other purpose, such as agriculture etc.
- The land under active mining would always remain river bed, during as well as post mining.
- However, mid-stream mining in accordance with approved mining plan would lead to systematic channelization of river bed and minimize chance of boulders overflowing the banks. This would protect the adjoining area from fury of monsoon floods.

##### 1.2 Mine Waste Disposal:

###### a) Year wise generation of mine waste and soil cover.

As explained earlier the following category of the waste is generated during river bed mining.

- Silt/ Clay Mixture

The silt and clay are generally being inseparable from sand and sold along with it.

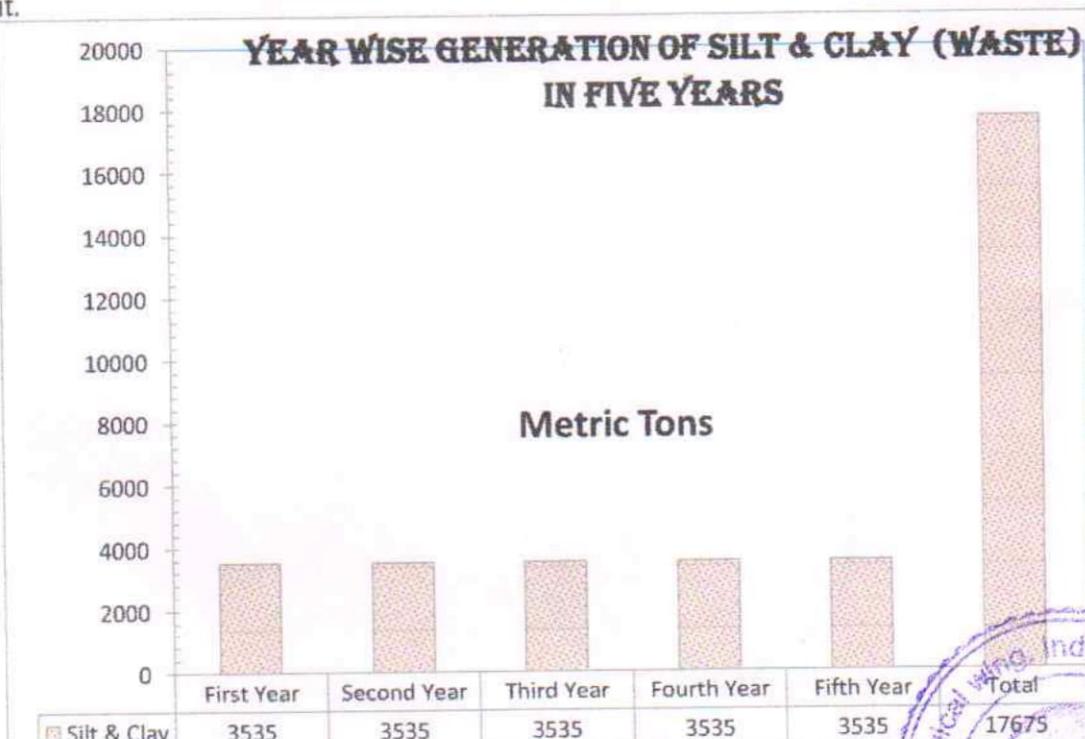


Figure 38: Year wise generation of waste and total waste expected to be generated in five years.



**MINING PLAN- Kedarpur-I (Yamuna River) Quarry,  
M/s Akhilesh Enterprises, Paonta Sahib, Sirmaur.**

b) Year wise disposal of waste and soil cover:

Yearly about 3535 metric tons of waste will be generated (In case it is separable) while mining stone, bajri and sand. Special arrangements for the disposal of waste, if any, is separated from sand, shall be made by transporting separated silt and clay to designate site where it will be spread over, and plantation would be done to consolidate it.

c) Cost of the mine waste disposal.

The waste, silt and clay, whenever separable, are required to be moved from the mining pits in the river bed to designated site on the bank, however the quantity being little, about 10 ton per day the annual cost would be around Rs.27950, for its disposal.

1.3 The arrangements made for top soil utilization, if any

As the mining area is part of river bed, having no top soil cover therefore, no top soil is required to be removed, disturbed, or disposed of.

1.4. Preventive Check dams

As the relies on both side are well away from safe mining areas, and the River in spate during monsoon rises more than two metres. Therefore, no protective measures for protection of banks are feasible.

1.5 Plantation work

There is 20720 square metres of area within the mining lease falling outside the river corridor. However, it is very sandy.

a) Year wise area to be covered under forestation.

Year wise area proposed plantation with, number of trees to be planted and amount spent is as given in the chart below

Year	Area to be covered (In Sq. Metres)	Number of trees to be planted	Cost of Plantation
First	1000	200	3000
Second	2000	350	5000
Third	2000	350	5000
Fourth	2000	350	5000
Fifth	3000	550	7000
Total	10000	1800	25000

**Year wise survival rate.**

Though the survival rate is about 70 percent in the area. However, after yearly review it will be ensure that the plants are properly looked after and in case of failure of some plants to survive, these will be promptly replaced. Thus, by the end of five years, the survival rate will be ensured to be at least 90 percent.

**2 STRATEGIES FOR PROTECTION OF POINT OF PUBLIC UTILITY etc.**

There is no point of utility within radius of 200 metres of the mining Contract periphery, which may need any kind of protection.

**3 MANPOWER DEVELOPMENT**

The mining activity will be mainly manual. Worker are mainly required in river bed mining for extraction and loading of river bed material in to tipper truck and tractor trolleys. Drivers for tippers and tractors will be another category of workers. Thus, employment potential is as given below:

Mines Supervisor cum clerk	1
Drivers	2
Unskilled workers	42

Thus total generation of Employment will be to a tune of 45 both skilled and unskilled workers.

**4 USE OF MINERAL**

The stone, sand and Bajri are used as raw material in the construction and infrastructure industry. Thus, these minor minerals will be marketed directly to the consumers.

**5 DISASTER MANAGEMENT & RISK ASSESSMENT:**

The mining Contract area part of River bed which is prone to some risk hazards but there will not be any major risk hazard associated with the process. The possible scenarios selected for this project are as below:

- Inundation / Flooding
- Drowning
- Accident during mineral loading, transporting and dumping
- Accident due to vehicular movement
- Earthquakes.

**Inundation/Flooding**



The consequences of flooding/ inundation are catastrophic or fatal.

The likelihood of occurrence of flooding is occasionally possible.

As per mining plan the mining work will not be carried during monsoon season. Thus, the sudden floods of monsoons shall have no impact on safety of workers.

#### **Accident during mineral loading, transporting, and dumping**

The consequences of this scenario are minor which may be taken care with first aid care.

#### **Accident due to vehicular movement**

The consequences of this scenario are moderate and may result in hospitalization and day loss. The likelihood of occurrence is occasionally possible.

#### **Earthquakes**

The area falls in seismic zone V. The mining operations are open cast pit mining. The mining pits will be only of one metre depth.

There won't be any structure in the area likely to cause risk to worker. The workers rest sheds, store building and toilets will be constructed of lightweight wood and tin sheets.

## **6. RECOMMENDATION FOR RISK REDUCTION**

#### **Measures to prevent Inundation/Flooding/drowning**

- Being on riverbed there should not be any mining operation during monsoon or rainy day
- Formation of deep pits should not be allowed
- Whenever there is any alert of flooding the workers will be moved to safer area along the banks.

#### **Measures to Prevent Accidents during Loading**

- The truck should be brought to a lower level so that the loading operation suits to the ergonomic condition of the workers.
- The loading should be done from one side of the truck only.
- The workers should be provided with gloves and safety shoes during loading.
- Opening of the side covers would be done carefully and with warning to prevent injury to the loaders.
- Operations during daylight only.

### Measures to Prevent Accidents during Transportation

- Vehicles will be periodically checked and maintained in good condition.
- Overloading will not be permitted;
- To avoid danger of accident roads and ramp near embankment should be properly maintained.
- The truck would be covered and maintained to prevent any spillage;
- The maximum permissible speed limit should be ensured;
- The truck drivers with proper driving license would only be employed.

### Measures to Prevent Accidents during Earthquakes

- Occasional drills to create awareness for safety measures during mining operations and specially the measures to be adopted during earthquakes etc will be undertaken in consultation with experts.



## Declaration

This is to declare that the Mining Plan including Progressive Mine Closure Plan of Minor Mineral Lease for Stone, Bajri and sand situated in Khasra No. 857 measuring 12.4100 hectares, Mauza & Mohal Kedarpur, Tehsil Paonta Sahib, District Sirmaur, has been prepared with our consent and approval and that we will abide by all commitments there under.

The 'Mining Plan and Progressive Mine Closure Plan' complies all statutory rules, regulation, orders made by competent authorities of State or Central Government or orders passed by courts have been taken into consideration and wherever specific permissions are required, shall be obtained.

We undertake to implement all measures proposed in the 'Mining Plan and Progressive Mine Closure Plan' in time bound manner.

We have deposited a sum of Rs..... with the competent authority of the State Government in form of fixed deposit Receipt as financial assurance of the same.

In case of default on our part, the approval of Mining Plan may be withdrawn and aforesaid sum assured may be forfeited

Date

Place



Kuldeep Singh (GPA)

For Akhilesh Enterprises

SPA Shri Kuldeep Singh,

Village Danda, P.O. Rajpur,

Tehsil Paonta Sahib,

District Sirmaur,

Himachal Pradesh

## Certificate

Certified that the provisions of the Himachal Pradesh Minor Minerals (Concession) and Minerals (Prevention of Illegal Mining, Transportation and Storage) Rules 2015, Metalliferous Mines Regulation 1961 and other guidelines issued in this regard, from time to time, have been complied for, in the preparation of Mining Plan, of Minor Minerals Lease for Stone, Bajri & sand situated in Khasra No. 857 measuring 12.4100 Hectares, Mauza & Mohal Kedarpur, Tahsil Paonta Sahib & District Sirmaur, of M/s Akhilesh Enterprises, Village Danda, P.O. Rajpur, Tehsil Paonta Sahib & District Sirmaur, Himachal Pradesh.

- While preparing the 'Mining Pan' including progressive mine closure plan all statutory Rules, Regulations, Orders made by competent authorities of State or Central Government or orders passed by Courts have been taken in consideration.
- The information provided and data furnished in this 'Mining Plan' is correct to the best of my knowledge.

Date

Place: Shimla



*Jamwal*  
Jhumpa C. Jamwal  
No. 21, Type IV,  
HP Government Officers Residences,  
Mehli, Shimla,  
Himachal Pradesh RQP Registration No.  
HP/RQP/21/1/2016