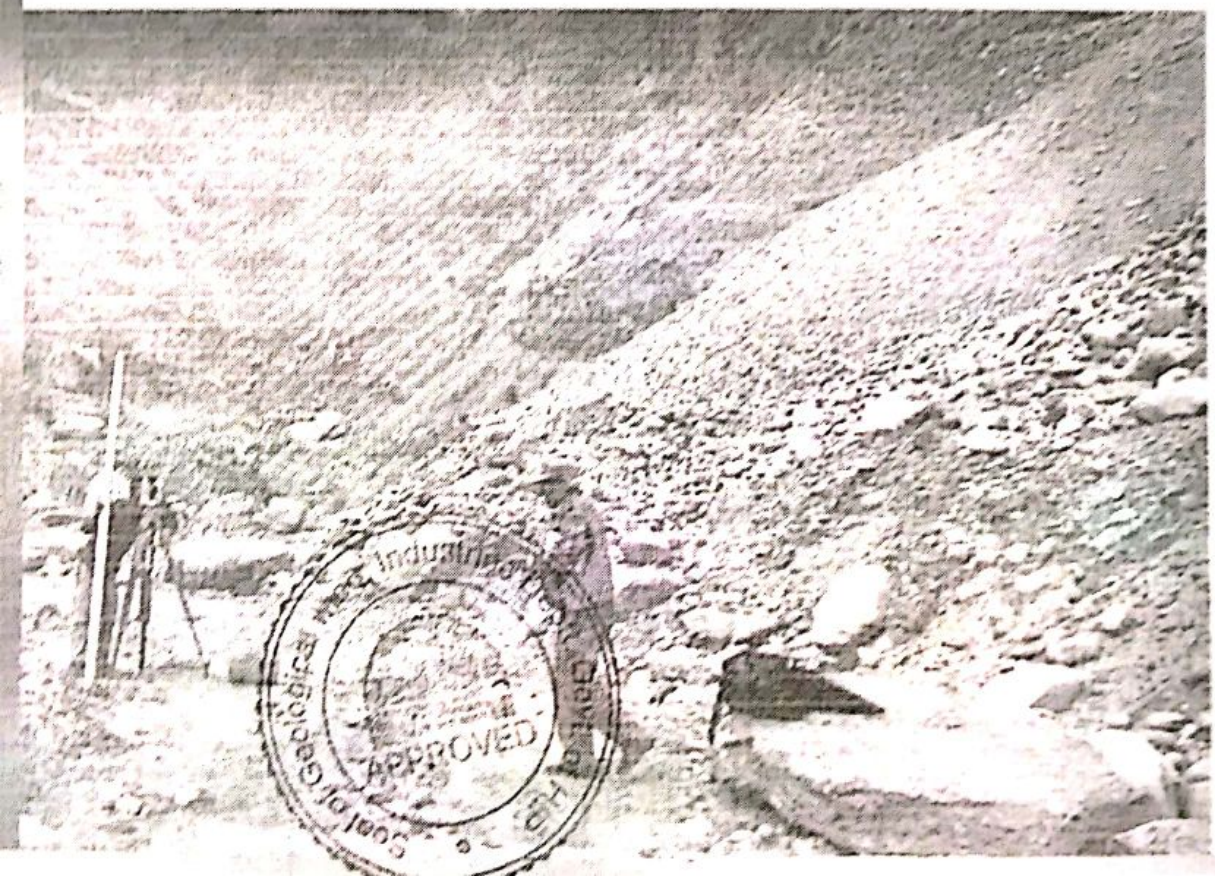
MINING PLAN

OF MINOR MINERAL CONTRACT FOR
STONE , SAND & BAJRI
SITUATED IN
KHASRA No.495/60/1 & 549/1/1,
MEASURING 8-01-15 BIGHAS,
MAUZA FIRNOO,
TAHSIL KARSOG AND DISTRICT MANDI,
LETTER OF INTENT GRANTED IN FAVOUR OF
Shri VED KUMAR,
VILLAGE FIRNOO & POST OFFICE SARAHAN,
TAHSIL KARSOG AND DISTRICT MANDI,
HIMACHAL PRADESH



2019

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भौमिकीय शाखा
उद्योग विभाग शिमला
Geological wing
Deptt. of Industries
Shimla
APPROVED
With Condition
शर्तों के साथ अनुमोदित
Vide Letter No. Udyog-Bhu (Khani-4) Laghu-7/3/2019
Dated 25/11/19
दिनांक

State Geologist
Himachal Pradesh

MINING PLAN OF MINOR MINERAL CONTRACT FOR SAND, BAJRI & STONE, SITUATED IN KHASRA No.495/60/1 & 549/1/1, MEASURING 8-01-15 BIGHA (0.6545 HECTARES), MAUZA FIRNOO, TEHSIL KARSOG AND DISTRICT MANDI, LETTER OF INTENT GRANTED IN FAVOUR OF Shri VED KUMAR, VILLAGE FORNOO & POST OFFICE SARAHAN, TEHSIL KARSOG AND DISTRICT MANDI, HIMACHAL PRADESH

INTRODUCTION

Shri Ved Kumar, of Village Firnoo & P.O. Sarahan, Tehsil Karsog and District Mandi, Himachal Pradesh, have been issued 'Letter of Intent' for mining contract for mining stone, sand & bajri for a period of two year vide letter No. Udyog-Bhu(Khani-4) Laghu-713/2019 dated 11-02-2019.

In accordance with condition 2 of 'Letter of Intent' and Rule 35 of the 'Himachal Pradesh Minor Minerals (Concession) and Minerals (Prevention of Illegal Mining, Transportation, and Storage) Rules 2015' the contractor should submit 'Mining Plan' for five years of the area applied for **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

The contracted block is a part of a terrace in Mauza Firnoo, tehsil Karsog of district Mandi. It lies at about 33 Km. from Karsog, the headquarter town of the Tehsil.

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1. General

1.1 Name and address of the applicant

1.1. A. Name of the applicant --

Shri Ved Kumar son of Shri Chatter Singh.

1.1. B. Address of the applicant –

Village: - Firnoo,

Post Office: - Sarahan,
Tehsil –Karsog,
District -Kullu.

1.2 Status of the applicant

Individual. Shri Ved Kumar is the sole owner of the concern running Mine.

1.3 Minerals which the Applicant intends to mine

The applicants intend to mine stone, sand & bajri. He intends utilize the mined material for open sale.

1.4 Period for which the mining contract is granted

Grant order yet to be issued.

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

Subhash Sharma
Flat No. 207, Basant Vihar
Kasumpti, Shimla: -171009.
Registration No.HP/RQP/01/2004
Telephone No. 9816029594.

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.

2.0 LOCATION AND APPROACH OF THE AREA.

2.1 Topo-sheet No. H 43F7

Surveyed by Survey of India
Surveyed in 1986-87
Updated in 2005
Published in 2010
Scale 1:50000

Latitude
31°21' 19.72" N
31°21' 18.5" N

Longitude
77° 21' 28.45" E
77° 21' 29.29" E

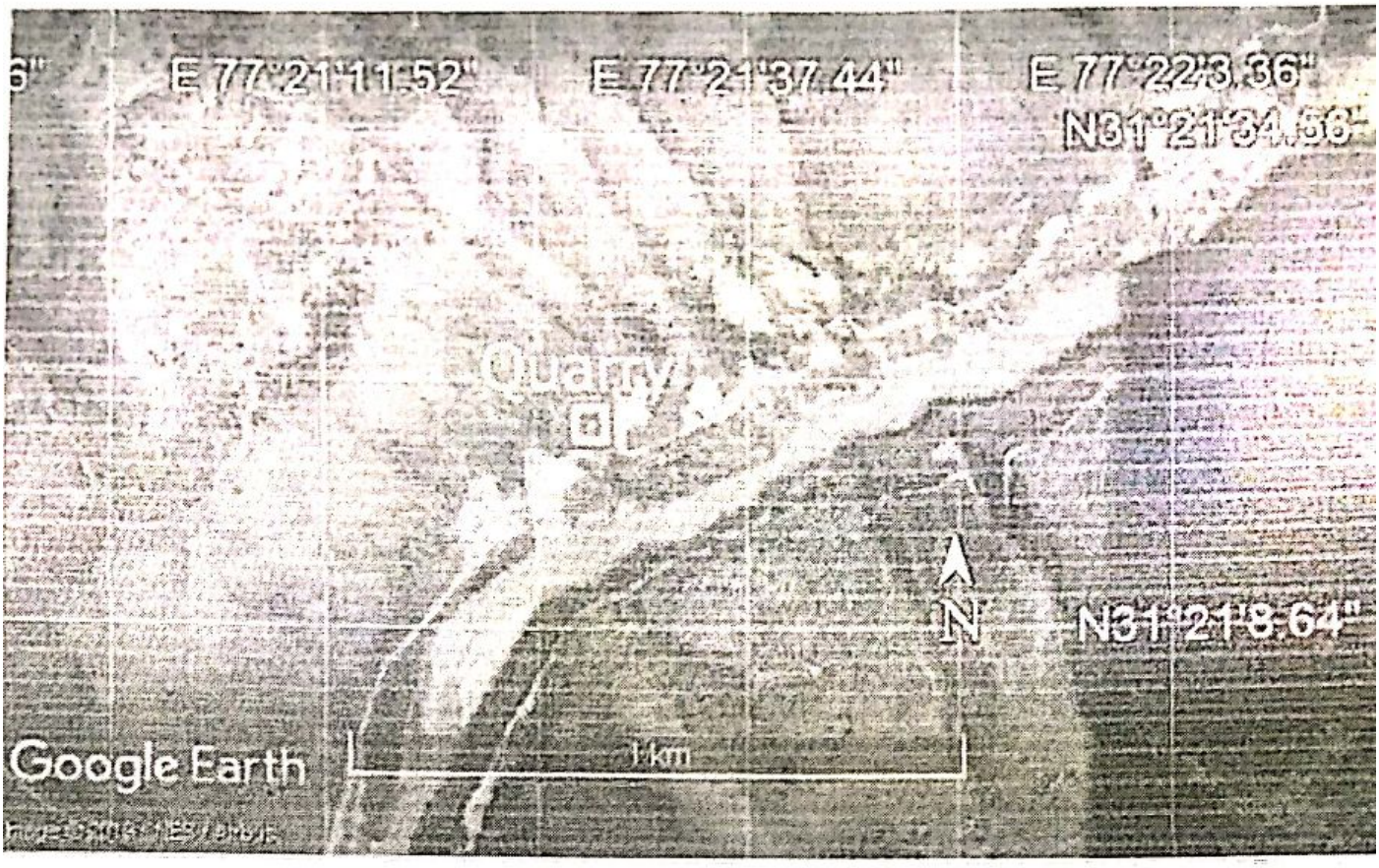

Figure 1 Location & Coordinates of Contract Area.

2.2 Location Details of the Area.

2.2a Revenue Details of the Area.

Table 1 : Details of Revenue Record

Khasra Number	Area Bigha	Owner of Land	Kism	Mauza
495/60/1 549/1/1	8-01-15	Government	Ghasani	Firnoo
Total	**08-01-15 Bighas (0.6545 Hectares)**			

2.3 Address Details

Village: -	Firnoo
Patwar circle: -	Sarahan
Post Office: -	Sarahan
Tehsil: -	Karsog
District: -	Mandi
Sub-Divisional Office (Civil): -	Karsog
Divisional Office (Forest): -	Karsog
Range Office (Forest): -	Karsog
Sub Divisional Office (IPH): -	Karsog
Sub Divisional Office (PWD): -	Karsog

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State : Himachal Pradesh

2.4 Distance from Important Places

Sr. No	Place	Distance(In Km)
1	Karsog Tehsil HQ • Road	33
2	Shimla (State HQ) • Road (National Highway 22) • Narrow gauge Railway • Airport	110 130
3	Mandi (District H Q & Sub-Divisional Officer, Civil) • Road	130
4	Rampur • Road	44

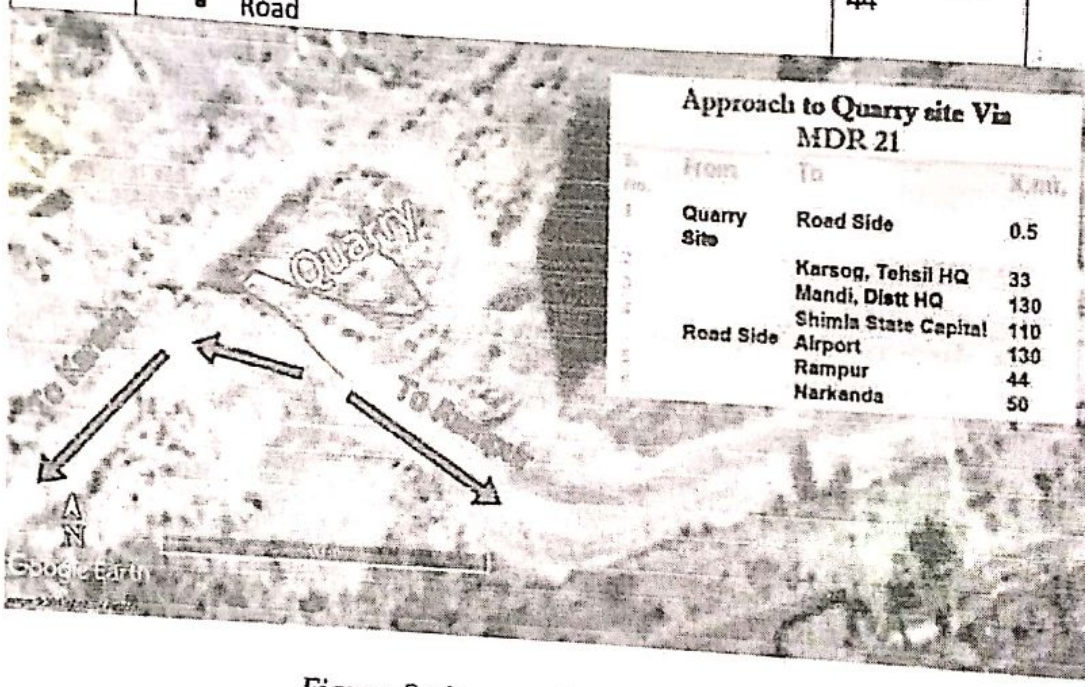


Figure 2: Approach to Quarry site

2.5 Approach to the Area.

The quarry site is located on the hill side and can be approached from Karsog via Karsog – Lurie MDR 21 (33 K.mt).

3. Physiographical Aspect of the Area

3. 1 General

The area in general is a part of the Lesser Himalaya. The Lesser Himalayas, located in northwestern India in the states of Himachal Pradesh and

Uttar Pradesh, in north-central India in the state of Sikkim, and in northeastern India in the state of Arunachal Pradesh, range from 1,500 to 5,000 meters in height. The general relief of the Mandi District is as given below in the figure: - 4: -

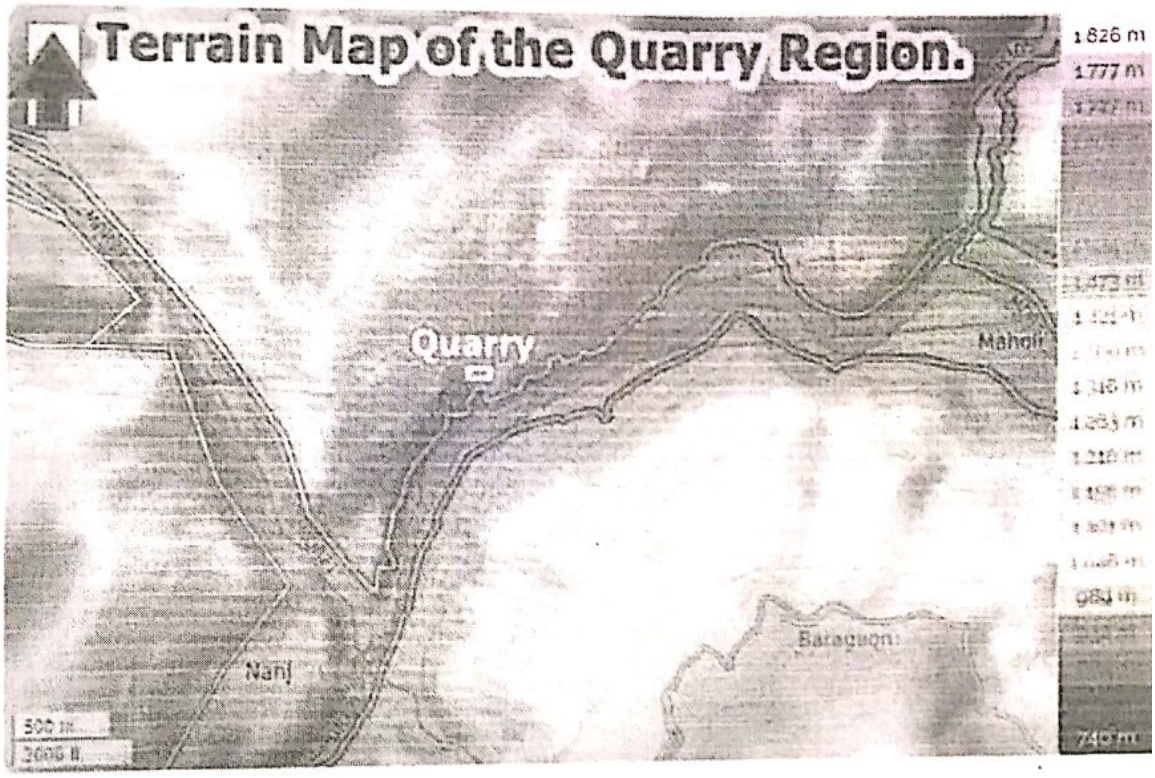


Figure 3: Terrain Map of the Area.

The Satellite photograph taken from the Google (Figure: -3) to depict the general physiography of the area showing that the major ridges/water divides are generally running N-S and all spurs are running parallel to the NE-SW line.

3.2 Altitude of the area

The general terrain of the area is hilly. The area is drained by Satlu River. The mining contract area is part of an old Terrace.

- The highest point of contracted out area is 812 Meters above MSL,
- The lowest point of the contracted-out area is less than 756 Meters above MSL,

3.3 Climate of Area

The climate of district is hot in summer as it is situated in valley at lower altitude while surrounding mountains top experience pleasant weather and cold in winters. Monsoon brings plenty of rain from July to September. October to November is pleasant weather, during this time Lake is completely full. Hottest months are May and June when temperature usually hover around 37-38 degree Celsius and

sometimes for few days jumping to above 40 degrees Celsius, the nights are comparatively cooler and month wise temperature is given in figure 7.

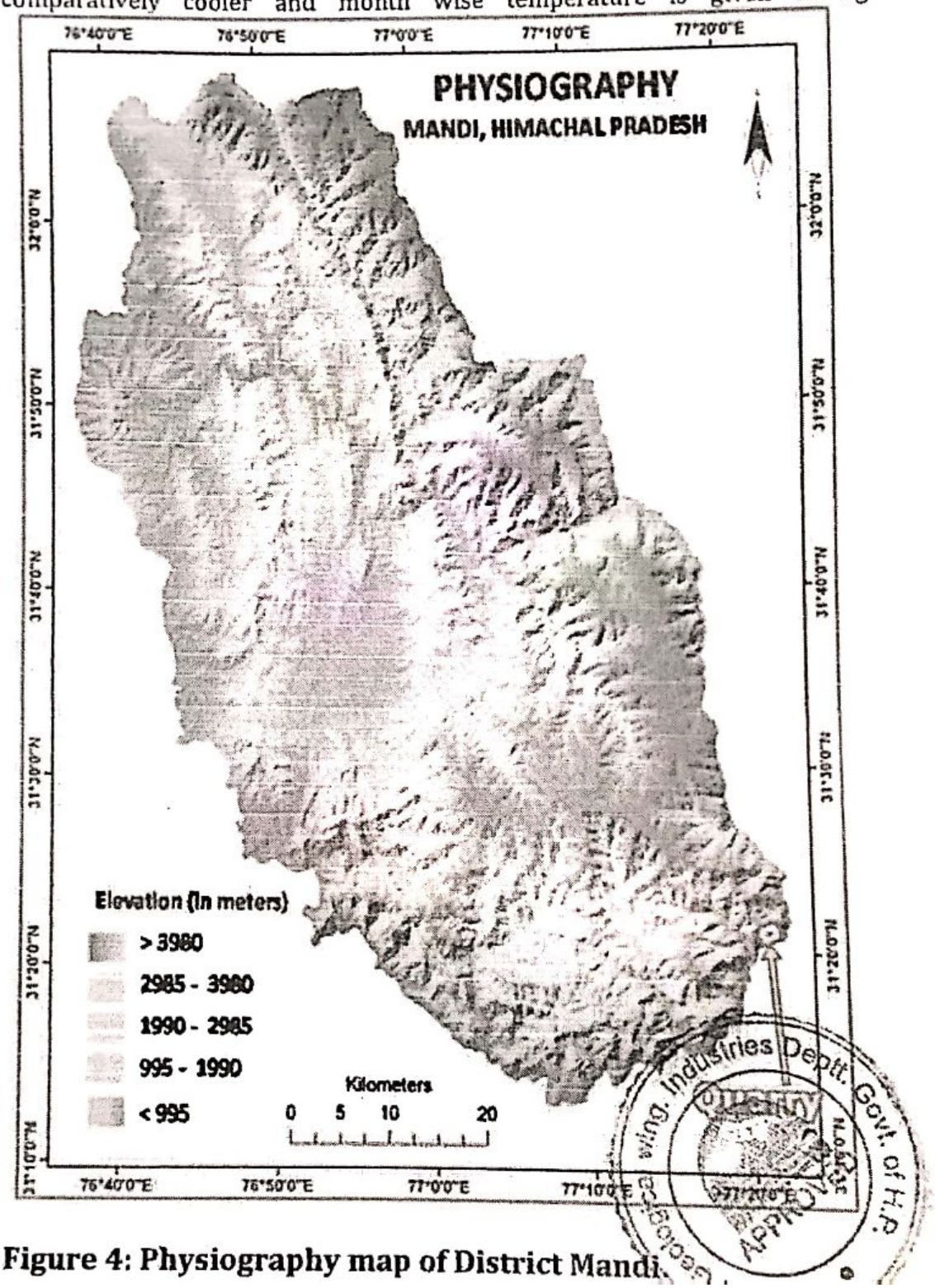


Figure 4: Physiography map of District Mandi.

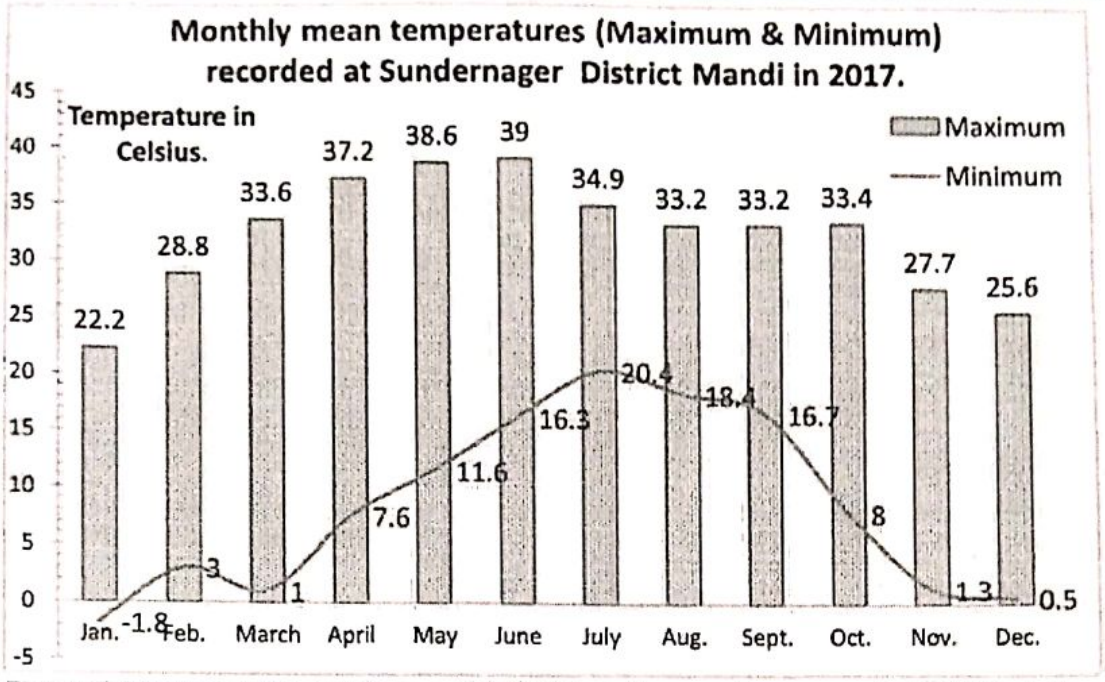
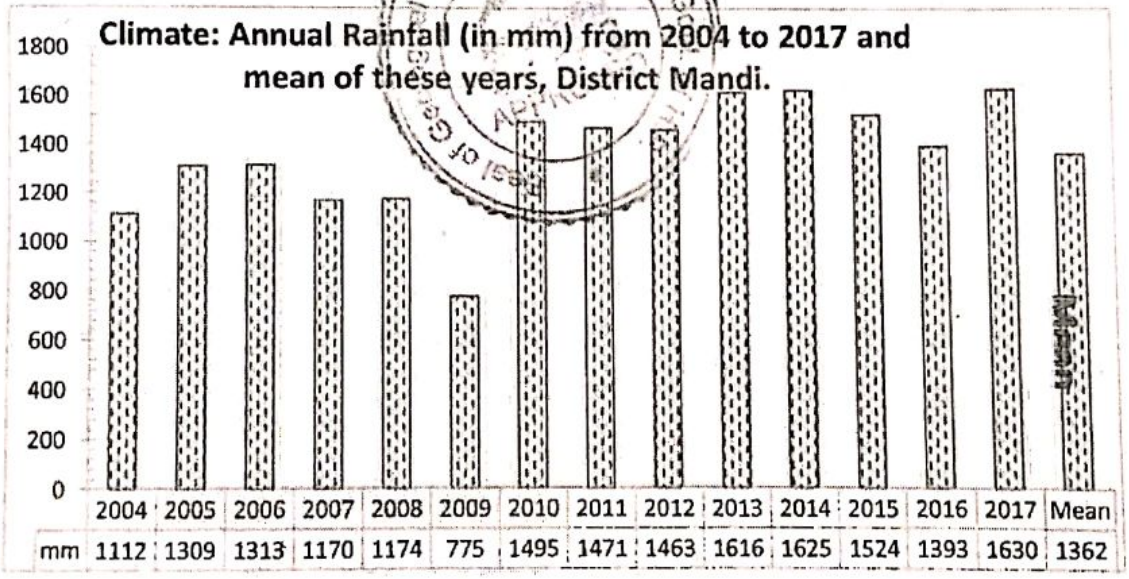


Figure 5: Mean monthly maximum and minimum temperature recorded at IMD station at Sundernager.

3.4 Rainfall Data



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Mean
mm	1112	1309	1313	1170	1174	775	1495	1471	1463	1616	1625	1524	1393	1630	1362

Figure 6: Rainfall of the District.

3.5 Any other important feature

The mining contract area falls in rugged terrain of Himalayan mountain and accessibility to the quarry site is through a major district road 21.

PART I

(1) Description of the area in which the mining contract is situated.

1.1 General

The mining contract area situated on the norther slope of a Dhar, part of catchment of Sutluj River. It is part of rugged mountain of mid Himalayan Range,

1.2 Slope angle: Description of ridges and valleys.

The slope angle of the old Terrace varies from 15^0 to 35^0 in the area. The average angle of slope of contract area is approximately 28^0.

The general terrain of the area is hilly. The area is drained by the Sutluj River.

1.3 Type of drainage.

The type of drainage of the area is Dendritic. The mining contract area is on the southern slope of the a Dhar draining in Sutluj River. The highest peak in the north- north- west is 2275 metres from MSL.

1.4 Susceptibility to Landslide.

The mining contract area and its adjoining area is predominantly formed of streaky gneiss and is quite stable.

1.5 Springs in the Area.

Springs are the main source of potable water, though the discharge in some of them is greatly reduced during the summer months. However, no spring was observed in the mining area or its near vicinity of 100 metres.

1.6 Other Details.

There is no point of Public utility like village, road, school, residential house, hospital etc located nearby area as per norms.

2.0 Geology

2.1 Regional Geology.

GEOLOGICALLY Himachal Pradesh can be broadly divided into two major geo-tectonic zones viz. the Lesser Himalayan tectogen in the south and the Tethys Himalayan Tectogen in the north. These two tectonic zones are juxtaposed with each other along a major tectonic break collectively designated as Main Central Thrust in the sense defined by Srikantia (1988). Mandi District lying within the Lesser Himalaya and the Shiwalik Foothill comprises rocks ranging in age from Proterozoic to Quarternary. The oldest rocks are of undifferentiated Proterozoic age, comprising canrbonaceous phyllite, schist, gneiss, quartzite, and marble. The Ghoghar Dhar (Undifferentiated Proterozoic age) occurs as an intrusive body within the Chail Group of rock. 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 Shali Group of Rocks (Meso- Proterozoic) Comprising limestone, dolomite, (at places stromatolytic) slate, & quartzite. The Subathu consists mainly, of olive green shales and grey shales. At the top, a band of white quartzite is exposed; this band of white quartzite has been taken as the marker, defining the top of the Subathu sequence. The thick sequence of brackish and fresh water sediments immediately succeeding the fossiliferous marine Subathu are classified as Dharamshala Formation. The Dharamshala Formation are widely exposed in the Mandi parautochthon, further west in the autochthon, these rocks are exposed, in the core of the Sarkaghat anticline. The Shiwalik Group of Middle Miocene of Early Pleistocene age comprises coarse clastic fluviatile 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.

2.2 Local Geology

The rocks of the contracted out belong to rocks of the paleo terrace of River Satluj.

2.3 Details of prospecting work undertaken in the mining area.

The paleo terrace of Satluj river consisting of boulders, stone, bajri and sand and clay has extensively been mined in the area and quite exposed therefore no prospecting work was felt necessary.

exploration was undertaken.

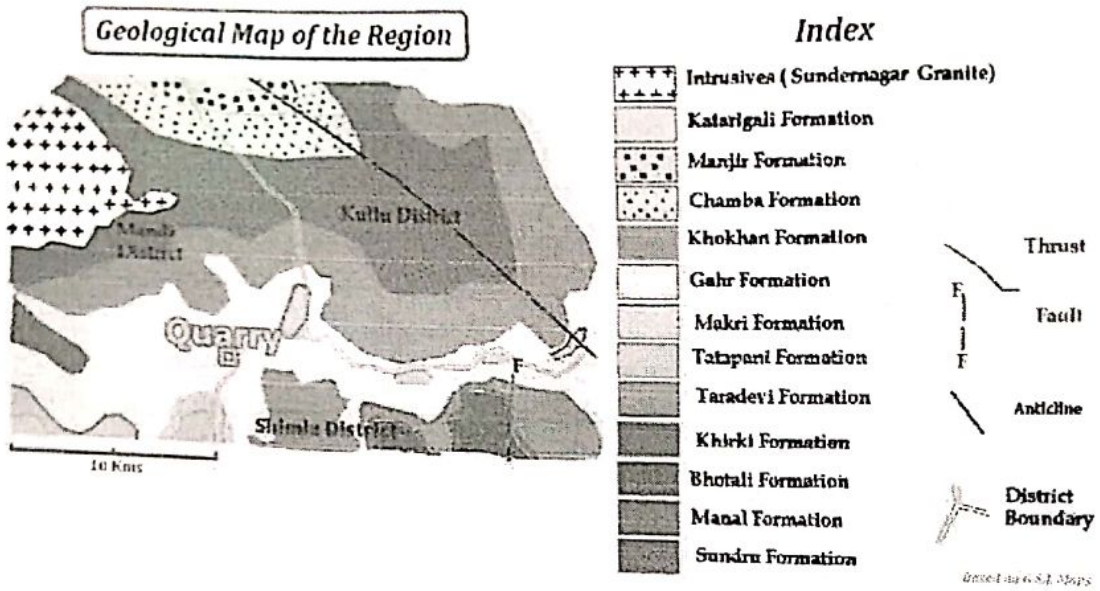


Figure 7: Geological Map of the surrounding contract area.

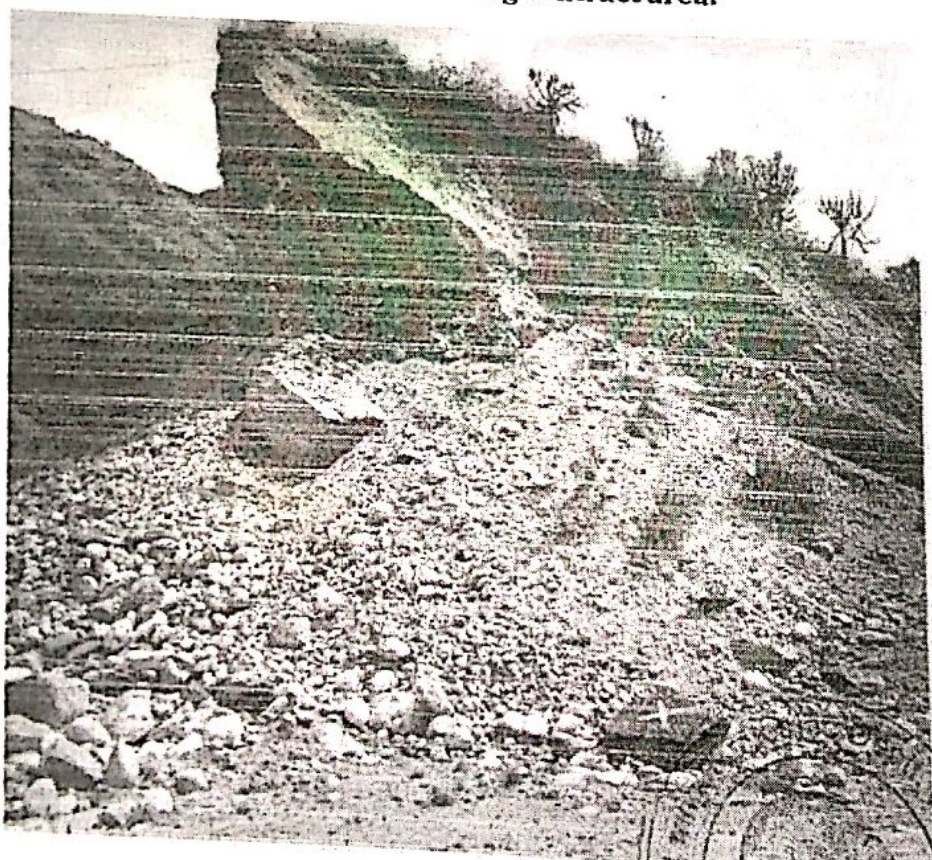


Photo 1 Part of Contract area.

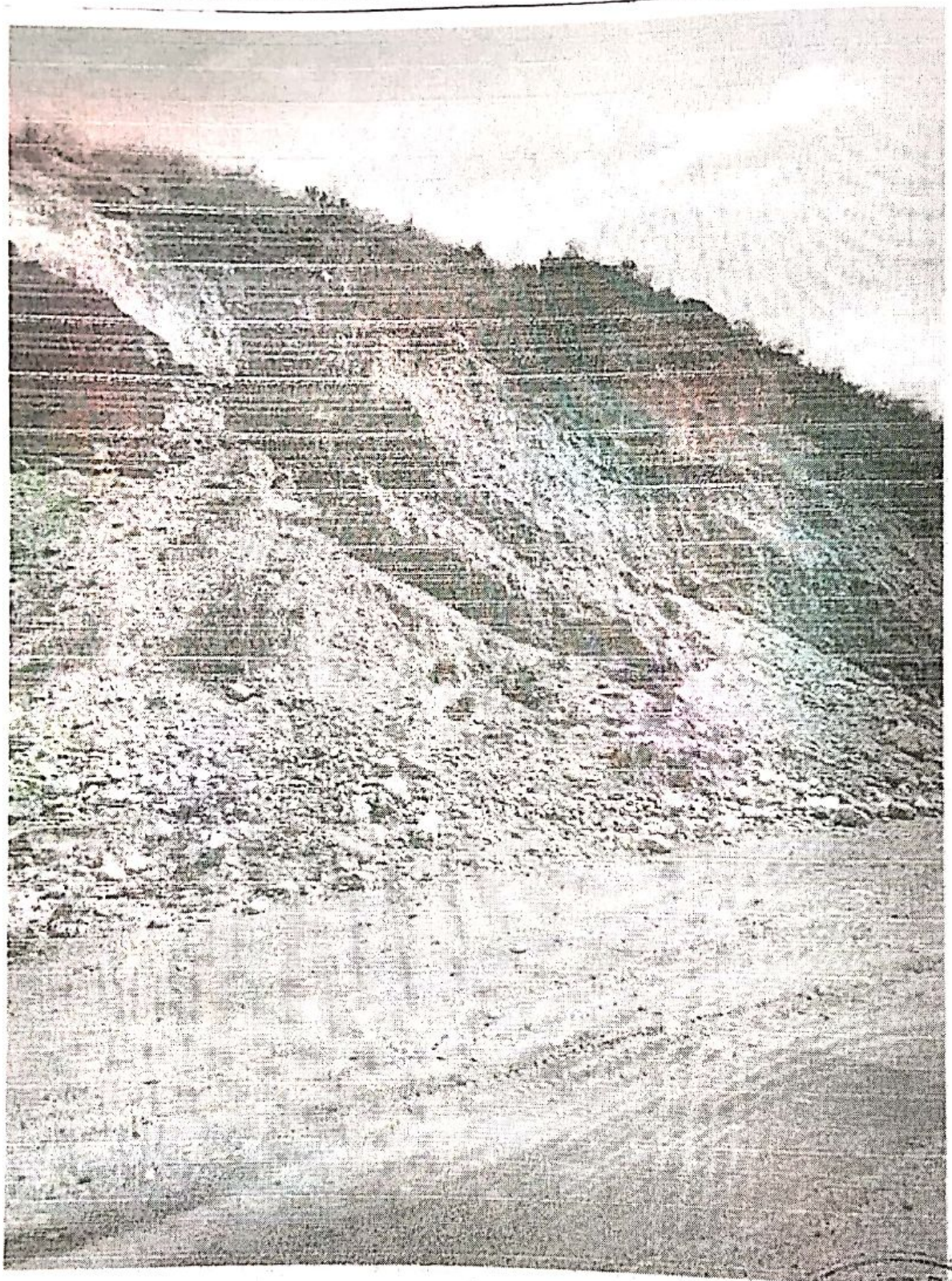


Photo 3 Part of contract area.

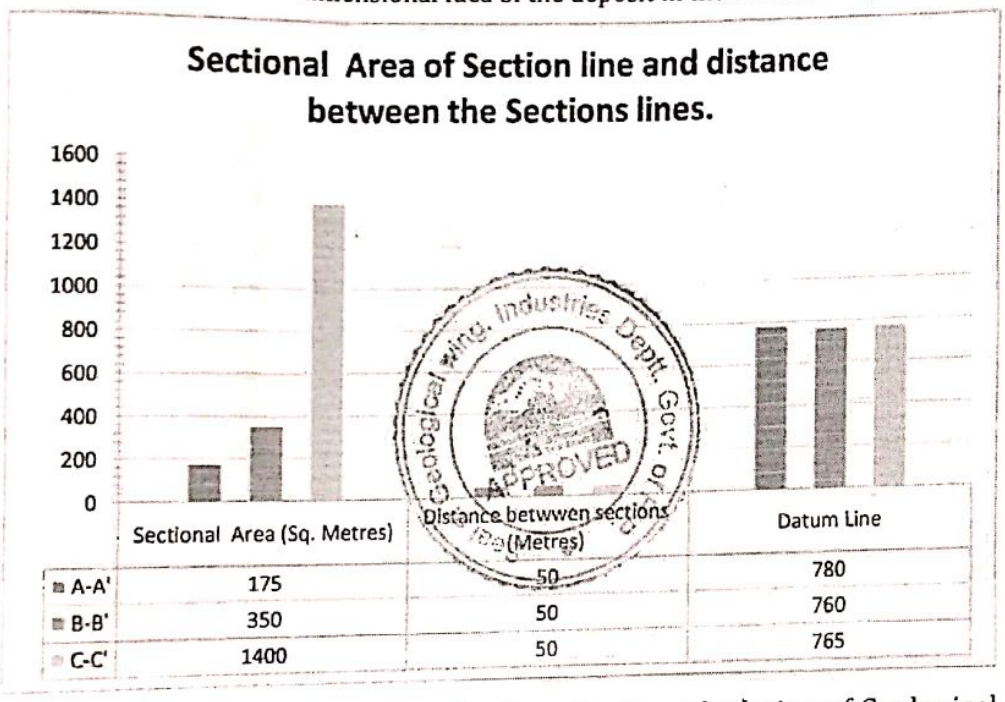
2.4 The nature of Rocks.

The paleo terrace of Satluj river consisting of boulders, stone, bajri and sand and clay has extensively been mined in the area.

3. RESERVE

3.1 Estimates of Geological Reserves

For the calculation reserve three Geological Section (AA', BB' & CC') at an interval of 50 meters are drawn to get a three-dimensional idea of the deposit in the contract area.



	Sectional Area (Sq. Metres)	Distance betwwen sections (Metres)	Datum Line
A-A'	175	50	780
B-B'	350	50	760
C-C'	1400	50	765

Figure 8: Area of Section lines for the calculation of Geological Reserves.

3.1b Specific Gravity

The specific gravity of the Gneiss varies from 2.6 to 2.7 depending upon the compactness of rock, therefore for this quarry site is taken as 2.65

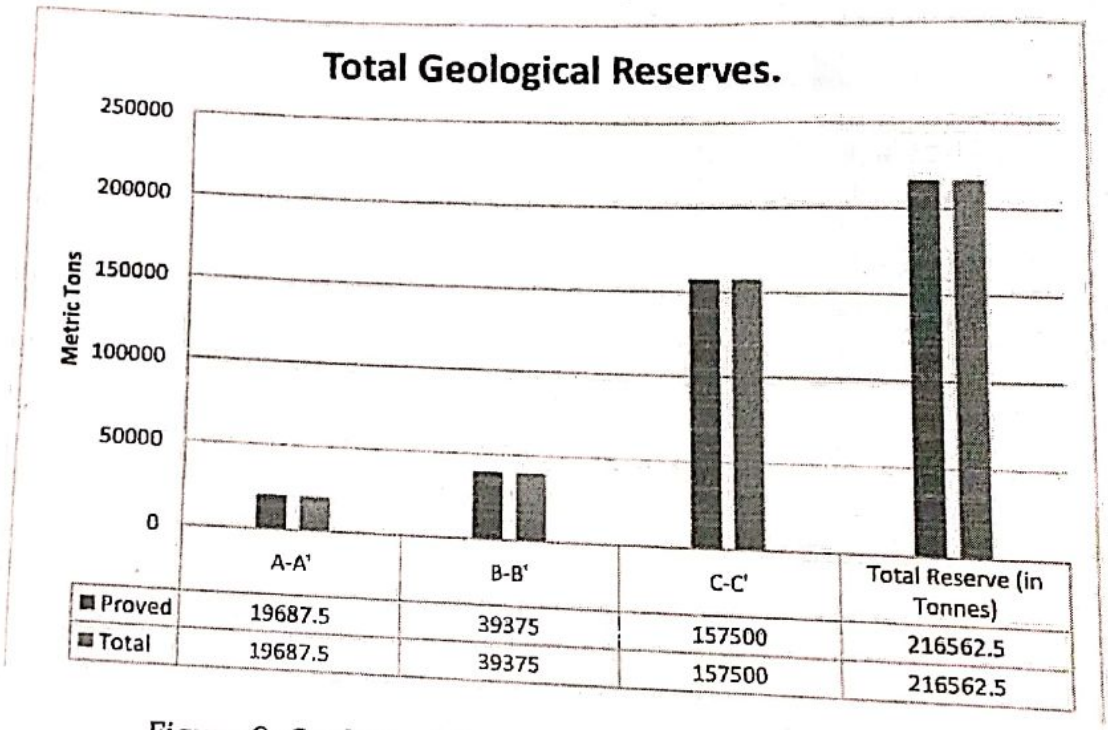
3.1 c Total Geological Reserve

The geological Reserve are considered up to datum line at 780/760 metres from MSL.

Total geological Reserve is calculated, based on section lines (see map 3) and section distance (to have geomorphological consideration) but mine-ability and other factors i.e. buffer zone, etc. are not the factored in calculation of geological reserve.

Except 5 % of clay waste all other material that is minable is resource i.e. mineral.

The total geological reserve in the area is given below in the figure:-9.



	A-A'	B-B'	C-C'	Total Reserve (in Tonnes)
Proved	19687.5	39375	157500	216562.5
Total	19687.5	39375	157500	216562.5

Figure 9: Geological Reserve of the contracted-out area.

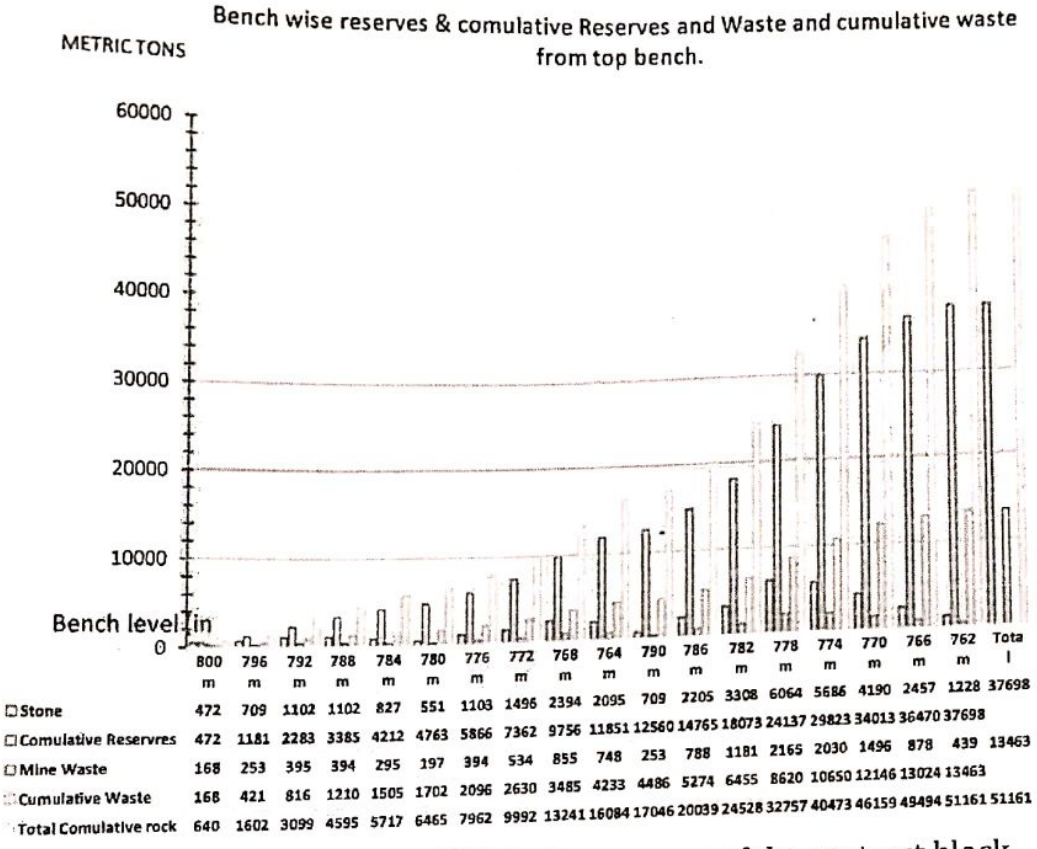
3.2 Constraining Factors

For mine able reserve following are important considerations

- The buffer zone of five meters from boundary.
- There is no point of utility within constraining distance.
- The top bench is suggested at 800-meter level of working.
- The Workability is suggested up to 762-meter level of working for the next two year.
- Keeping in view the manual method of mining adopted by the contractor, the bench four metres by four metres are proposed.

3.3 mineable Reserves

Mine-able reserve is calculated after considering all the safety factors discussed in 3.2.



	800 m	796 m	792 m	788 m	784 m	780 m	776 m	772 m	768 m	764 m	790 m	786 m	782 m	778 m	774 m	770 m	766 m	762 m	Total
Stone	472	709	1102	1102	827	551	1103	1496	2394	2095	709	2205	3308	6064	5686	4190	2457	1228	37698
Comulative Reservres	472	1181	2283	3385	4212	4763	5866	7362	9756	11851	12560	14765	18073	24137	29823	34013	36470	37698	
Mine Waste	168	253	395	394	295	197	394	534	855	748	253	788	1181	2165	2030	1496	878	439	13463
Cumulative Waste	168	421	816	1210	1505	1702	2096	2630	3485	4233	4486	5274	6455	8620	10650	12146	13024	13463	
Total Comulative rock	640	1602	3099	4595	5717	6465	7962	9992	13241	16084	17046	20039	24528	32757	40473	46159	48494	51161	51161

Figure 10: Bench wise cumulative reserves of the contract block.

3.4 Conceptual Scheme of Mining.

- The buffer zone of five meters from boundary.
- There is no point of utility within constraining distance.
- The top bench is suggested at 880-meter level and the workability is suggested up to 838-meter level of working for the next five year.
- Keeping in view the manual method of mining adopted by the contractor, the bench four metres by four metres are proposed.

In total eighteen benches are projected, in two blocks A & B, at following levels.

	Bench Level	Area (Square Metre)	Average Height
Block A	800 m	100	3.00
	796 m	150	3.00
	792 m	200	3.50
	788 m	200	3.50

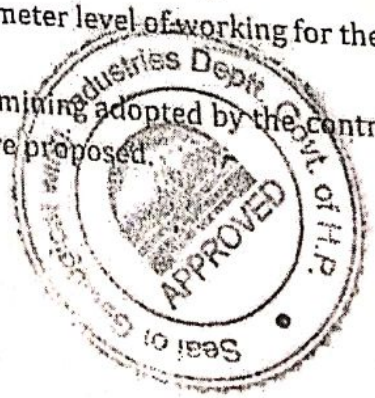
	784 m	150	3.50
	780 m	100	3.50
	776 m	200	3.50
	772 m	250	3.80
	768 m	400	3.8
	764 m	350	3.8
Block B	790 m	150	3
	786 m	400	3.5
	782 m	600	3.5
	778 m	1100	3.5
	774 m	950	3.8
	770 m	700	3.8
	766 m	400	3.9
	762 m	200	3.9

The rehabilitation is suggested only at places where no future mining will be undertaken, in keeping with the conceptualized future mining. To find out the bench wise development of the mineral the slice plan of each bench is drawn as generated and shown in map 3.

4. YEAR WISE DEVELOPMENT OF THE MINE

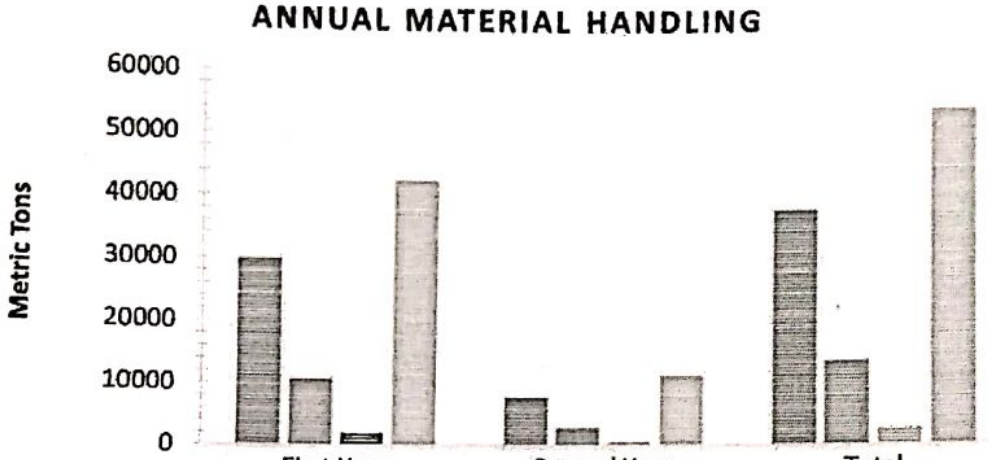
4.1 Considerations

- The buffer zone of five meters from boundary.
- MDR 21 is passing downslope of the area and adequate buffer has been provided for its safety.
- The top bench is suggested at 800-meter level of working.
- The Workability is suggested up to 762-meter level of working for the next two years.
- Keeping in view the manual method of mining adopted by the contractor, the bench four metres by four metres are proposed.



4.2 Production Program

The annual production program is as shown on figure 11.



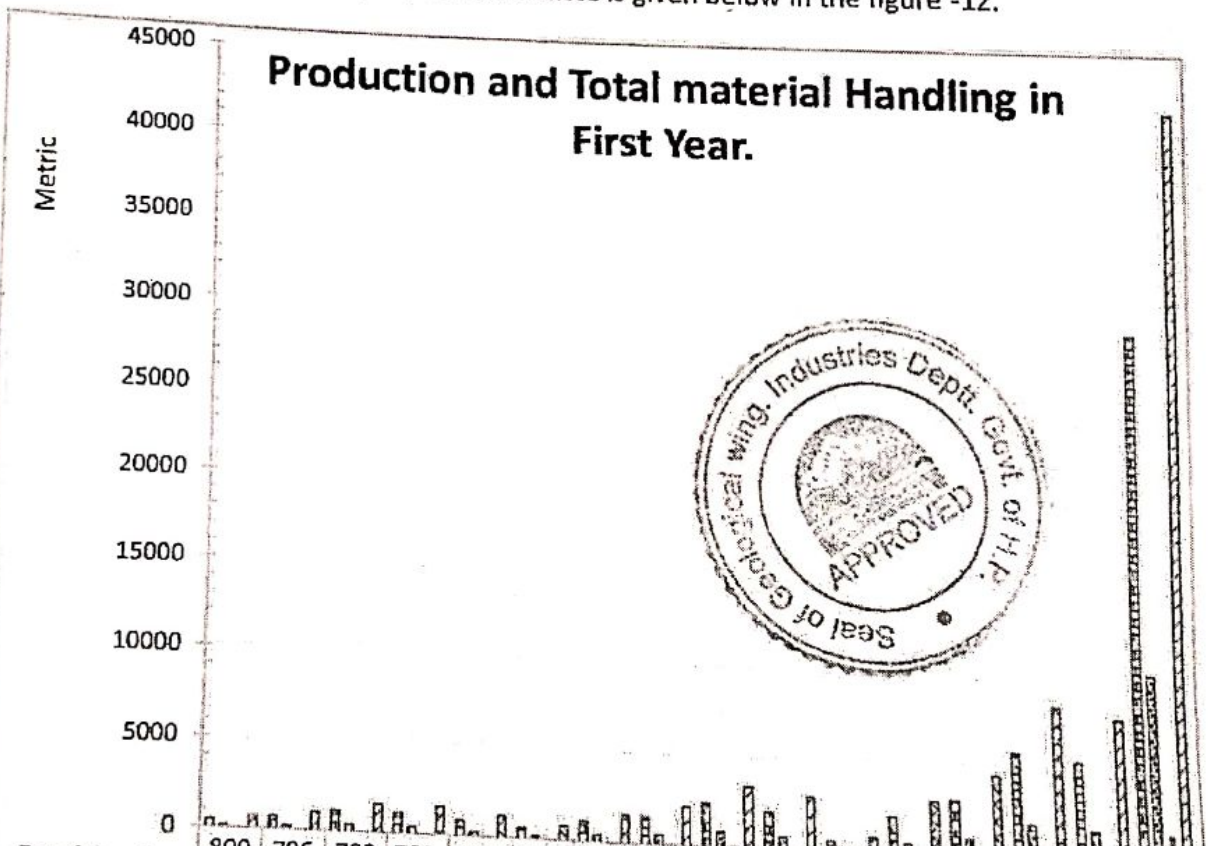
	First Year	Second Year	Total
Stone & Bajri	29823	7875	37698
sand	10650	2813	13463
Clay	2128	563	2691
Total	42601	11251	53852

Figure 11 : Annual production program.

4.3 a Working of 1st Year

- **Development of benches at 800 m, 796 m, 792 m, 788 m, 784 m, 780 m, 776 m, 772 m, 768 m & 764 m of block A and 790 m, 786 m, 782 m, 778 m & 774 metres level of Block B.**
  - 29823 metric tons of stone & bajri and 10650 tonnes of sand will be produced during development of this bench for free sale of produce.
  - 2128 metric tons of mine waste/clay will be generated and spread over the abandoned and exhausted parts benches (at S-1 as shown in Map 5).
  - For the protection of material rolling down the slope, check dam will be raised (Shown as RS-1 in map 5)
  - The plantation will be done at place shown map 5.(P-1)

Total production of mineral, top soil and waste is given below in the figure -12.



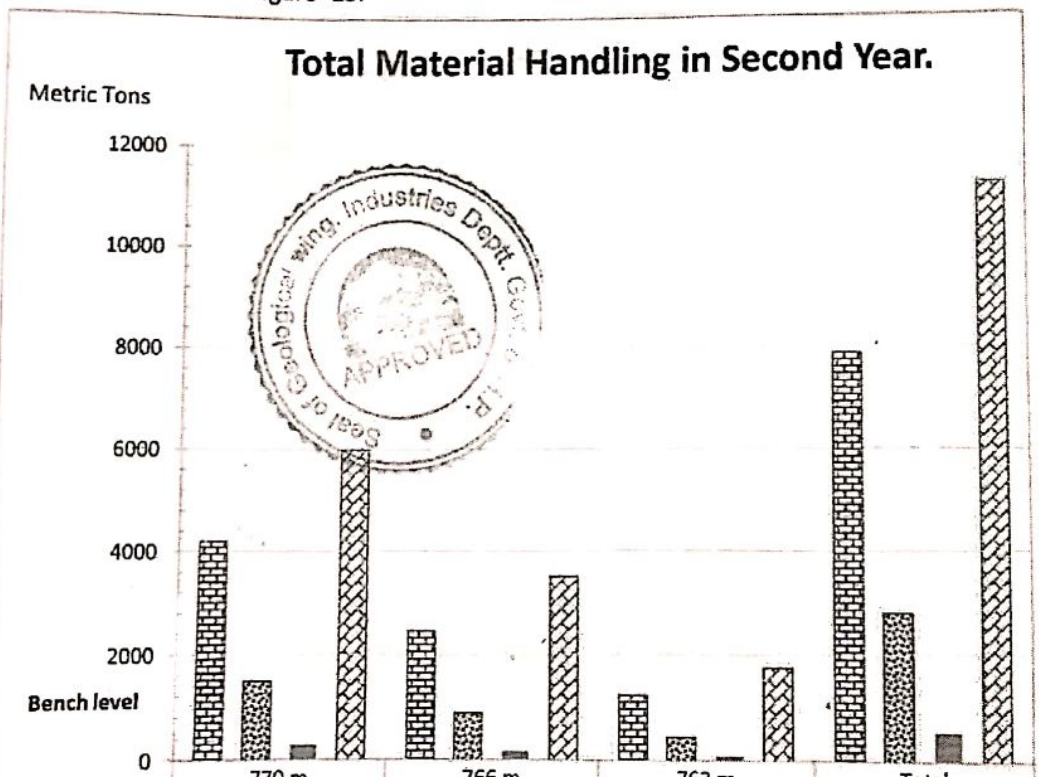
Bench level	800 m	796 m	792 m	788 m	784 m	780 m	776 m	772 m	768 m	764 m	790 m	786 m	782 m	778 m	774 m	Total
	Block A										Block B					
Stone & Bajri	472	709	1102	1102	827	551	1103	1496	2394	2095	709	2205	3308	6064	5686	29823
sand	168	253	395	394	295	197	394	534	855	748	253	788	1181	2165	2030	10650
Clay	35	50	78	79	59	39	78	107	171	149	51	157	236	433	406	2128
Total	675	1012	1575	1575	1181	787	1575	2137	3420	2992	1013	3150	4725	8662	8122	42601

Figure 12: Total production of mineral and topsoil during 1st Year.

4.3 b Working of Second Year:

- **Development of benches at 770 m, 766 m, and 762 metre level of Block B.**
  - 7875 metric tons of stone and bajri will be produced during development of this bench for free sale of produce.
  - 2813 metric tons of mine waste / clay will be generated and will be spread over the abandoned and exhausted parts of benches at S-2(Map 6).
  - For the protection of material rolling down the slope the check dam will be raised (Shown as RS-2 in map 6)
  - The plantation will be done at place shown map 6. (P-2)

Total production of mineral, waste and top soil is given below in the figure -13.



	770 m	766 m	762 m	Total
Stone & Bajri	4190	2457	1228	7875
sand	1496	878	439	2813
Clay	300	175	88	563
Total	5986	3510	1755	11251

Figure 13: Total production of mineral, rock waste and topsoil during 2nd Year.

4.4 Rate of Production.

Annual rate of production initially in the first year would be 29823 metric tons of stone & bajri and 10650 tonnes of sand or 135 metric tons of stone per day. This production would be reduced to 7875 metric tons of stone & bajri and 2813 tonnes of sand in the second year (36 tons per day).

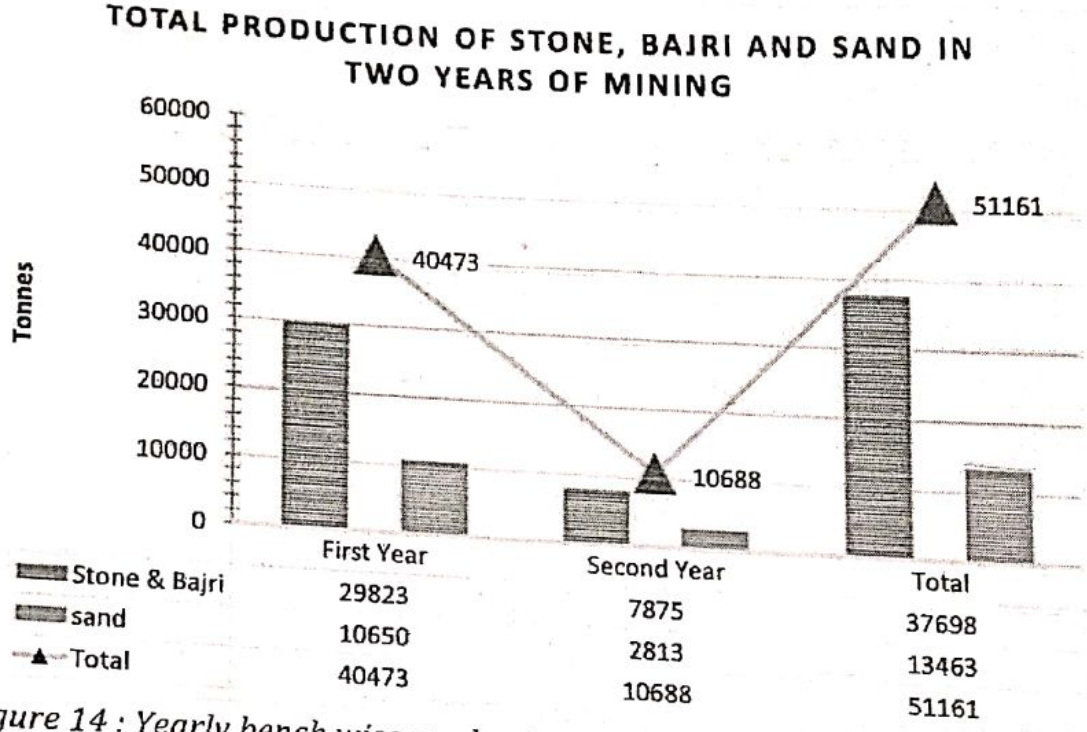


Figure 14 : Yearly bench wise production of stone for open sale.

4.5 Balance Material after Five Years.

If the proposed rate of production is maintained, all the eighteen benches will be exhausted in the next planned two years.

4.6 Mode of Working.

The working of the quarry will be mostly manual. No explosive material however be used.

4.7 Extent of Mechanization.

Only JCB will be used for mining and loading.

4.8: Blasting.

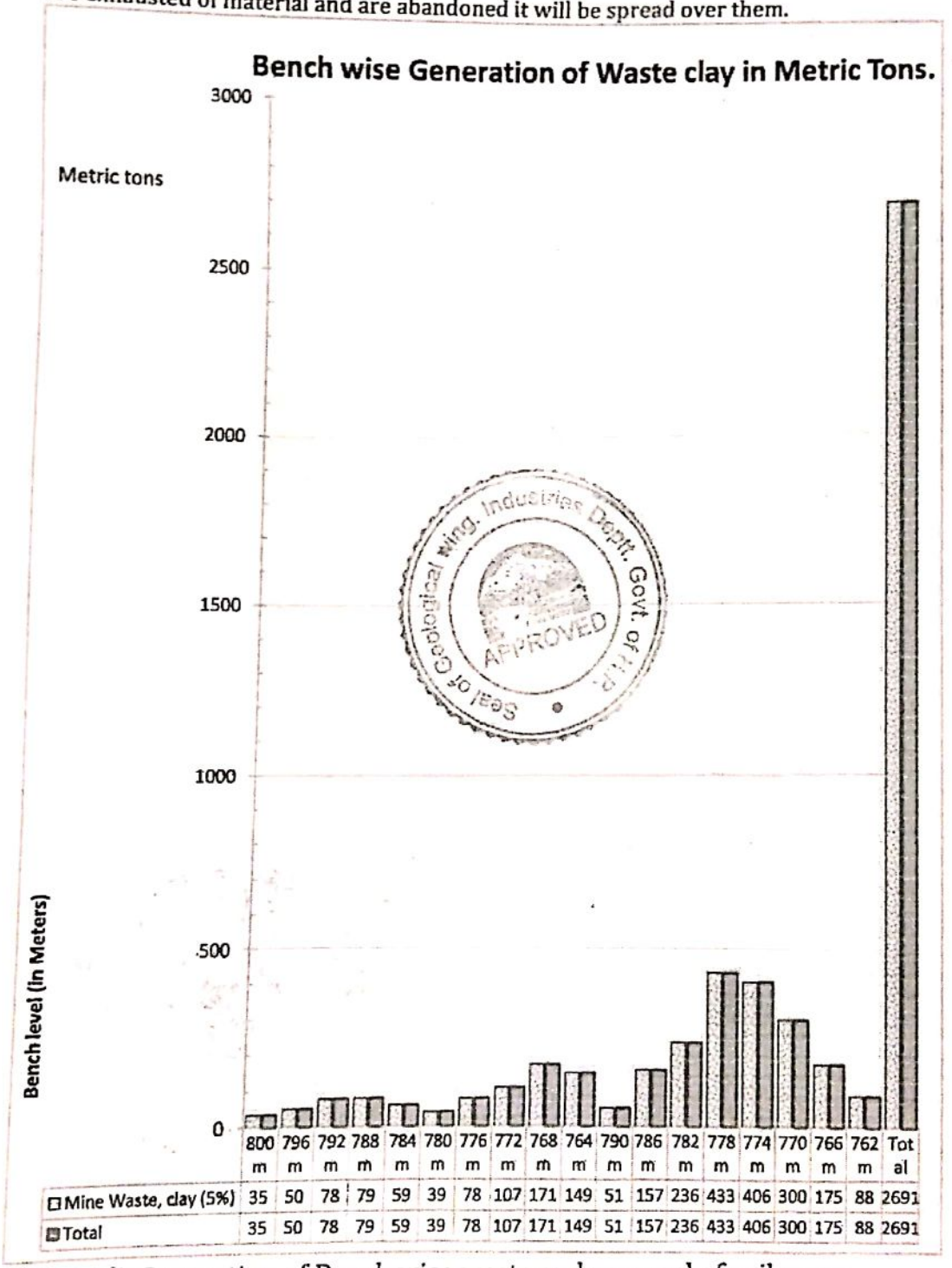
No blasting is required to be resorted to.

4.9 Mine Drainage

The mining contract area is a part of old Terrace. Thus, to drain the rain water during rainy days a garland drain around the mining contract will be formed so that no rain water is collected in the mining pits. All the rain water falling in the pits will seep through joints of the freshly opened rock formation.

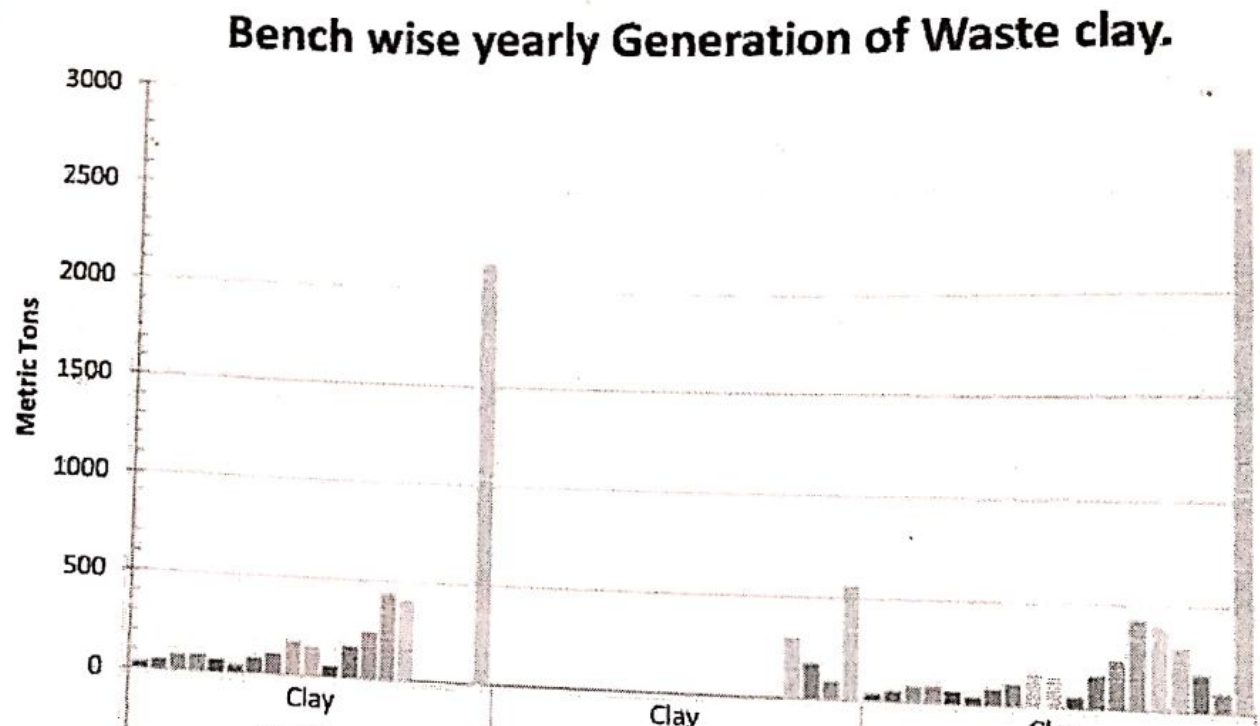
4.10. Waste management.

The entire mine waste will be initially spread over the safety zone and as the benches are exhausted of material and are abandoned it will be spread over them.



	800 m	796 m	792 m	788 m	784 m	780 m	776 m	772 m	768 m	764 m	790 m	786 m	782 m	778 m	774 m	770 m	766 m	762 m	Total
Mine Waste, clay (5%)	35	50	78	79	59	39	78	107	171	149	51	157	236	433	406	300	175	88	2691
Total	35	50	78	79	59	39	78	107	171	149	51	157	236	433	406	300	175	88	2691

Figure 15: Generation of Bench wise waste and removal of soil cover.



	Clay First Year	Clay Second Year	Clay Total
800 m	35		35
796 m	50		50
792 m	78		78
788 m	79		79
784 m	59		59
780 m	39		39
776 m	78		78
772 m	107		107
768 m	171		171
764 m	149		149
790 m	51		51
786 m	157		157
782 m	236		236
778 m	433		433
774 m	406		406
770 m		300	300
766 m		175	175
762 m		88	88
Total	2128	563	2691

Figure 16: Bench wise yearly Generation of Waste and removal of soil cover.

4.11 End use of Mineral

The mined rock will be used for open sale in the

4.12 Density of Road transportation

The mine contract has been granted for open sale in market. The maximum daily production will be 135 tonnes per day. The MDR 21 motorable road of 33 kilometers leading to Karsog will be able to bear this extra traffic of about 15 tipper trips a day. The figure 17 show the evacuation route from quarry to rural road on part of toposheet.

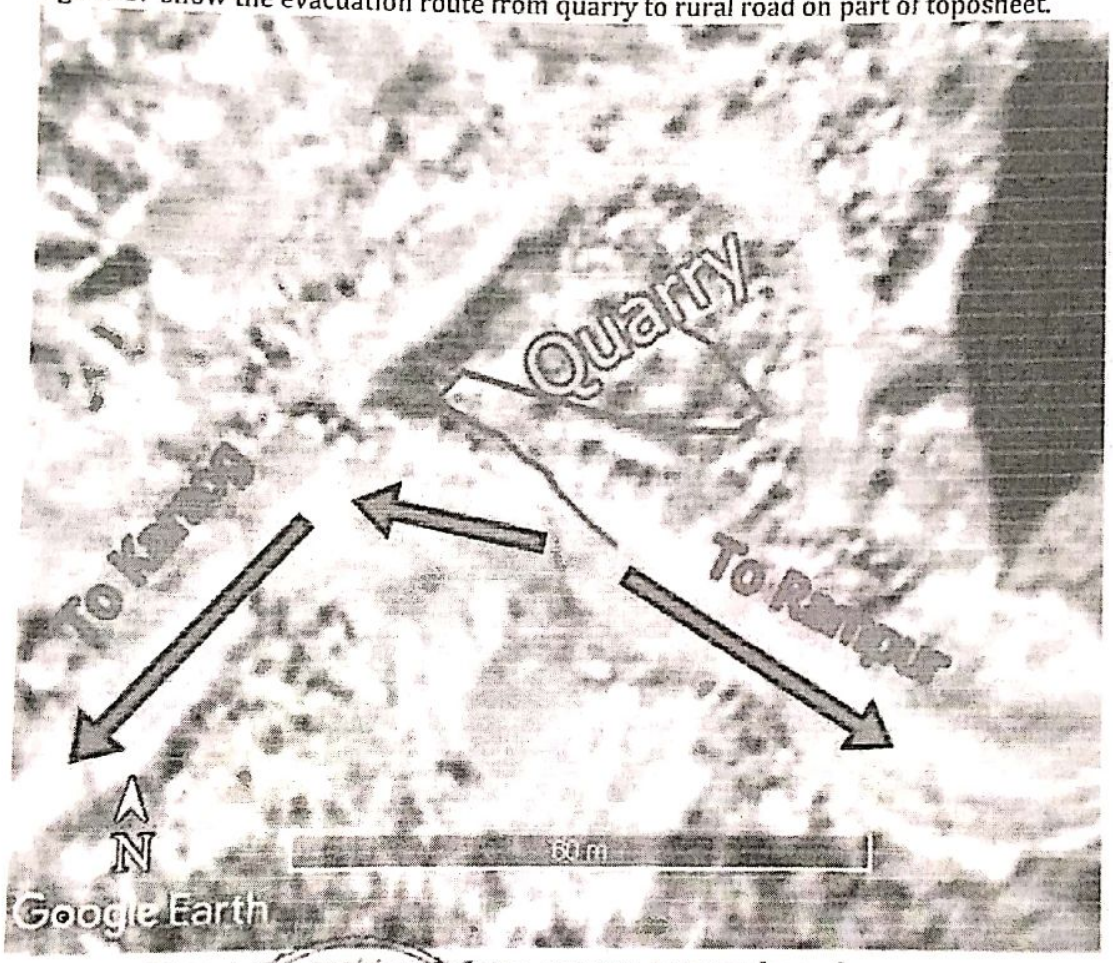


Figure 17: *Approach from quarry to rural road.*

PART II

1. Environment Management

1.0 Introduction

Any development activity, including mining, is likely to have adverse as well as beneficial impact on existing environment. The various environmental parameters generally impacted are as given below: -

- Change in Topography& land use pattern.
- Effect on Flora & Fauna
- Ground Vibrations and Fly Rocks.
- Effect on Hydrology
- Effect on Climate - Temperature
  - Rainfall
  - Wind Speed
- Air Quality
- Noise level
- Visual Impact
- Socio- economic Impact
- Accumulation of Scree - Mine Waste.

Base Line Data

General

Base Line Information

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

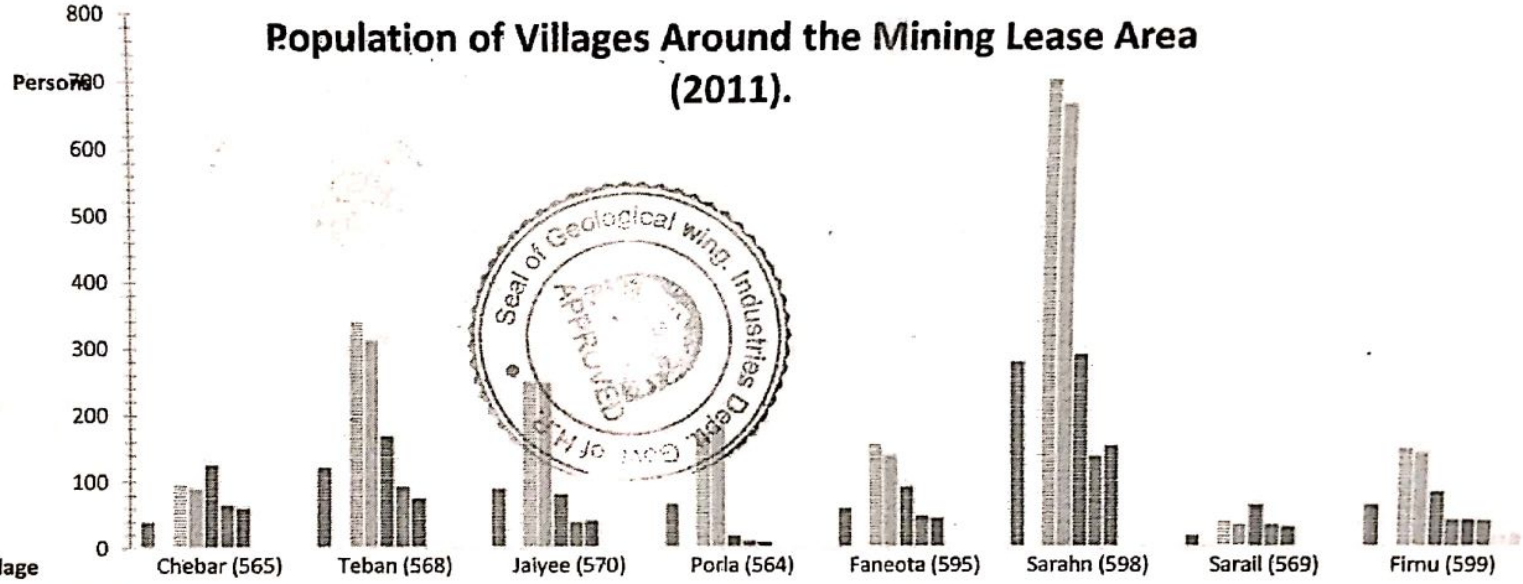
- ✓ Census Department, Government of India.
- ✓ Department of Economics and Statistics, Government of Himachal Pradesh.
- ✓ Directorate of Land Records, Government of Himachal Pradesh.
- ✓ Directorate of Horticulture. Government of Himachal Pradesh.
- ✓ Fishery Department, Government of Himachal Pradesh.
- ✓ 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.

Geological wing, Industries Deptt. Govt. of H.P. APPROVED

1.2. Demography of the area

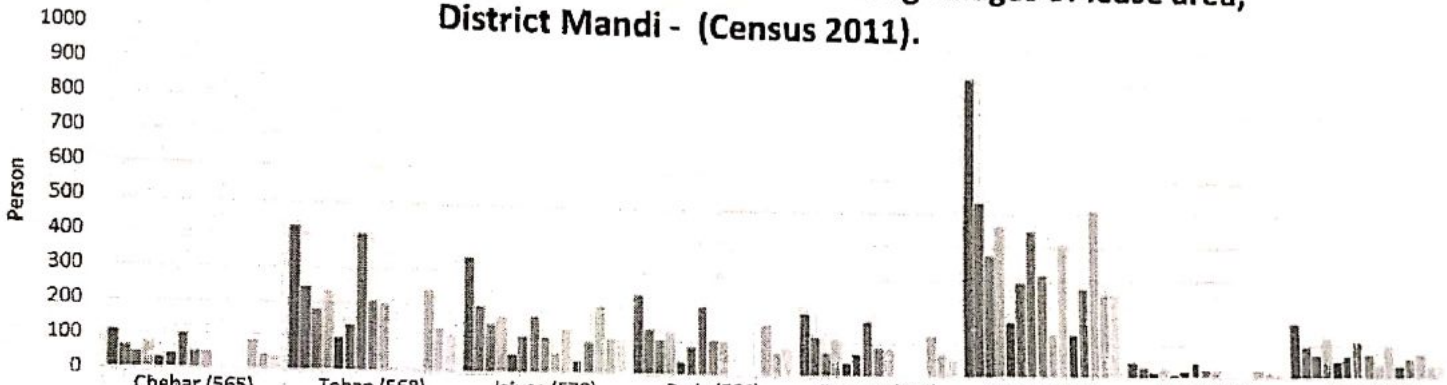
The total population of the surrounding area, as per the 2011 Census is given below in the figure 18. Education wise and employment wise break of population in surrounding villages is given in figure 19. The population details of Mandi District and tehsil Karsog are given in figure 20.



Village	Chebar (565)	Teban (568)	Jaiyee (570)	Porla (564)	Faneota (595)	Sarahn (598)	Sarail (569)	Firnu (599)
Total House Hold	39	122	90	67	60	282	17	65
Population	0	0	0	0	0	0	0	0
Male	96	342	253	175	159	706	39	150
Female	90	315	252	186	140	669	35	143
Schedule Caste	125	170	81	18	93	294	65	84
SC_Male	65	94	39	10	48	139	34	42
SC_Female	60	76	42	8	45	155	31	42
Schedule Tribe	0	0	0	0	0	0	0	41
ST_Male	0	0	0	0	0	0	0	20
ST_Female	0	0	0	0	0	0	0	21

Figure 18; Population of the villages of the zone of influence.

Working Categorisation of Population of surrounding villages of lease area, District Mandi - (Census 2011).



	Chebar (565)	Teban (568)	Jaiyee (570)	Porla (564)	Faneota (595)	Sarahn (598)	Sarail (569)	Firnu (599)
Total Literate	110	423	341	237	190	911	46	168
Male Literate	64	244	198	135	118	536	30	96
Female Literate	46	179	143	102	72	375	16	72
Total Illiterate	76	234	164	124	109	464	28	125
Male Illiterate	32	98	55	40	41	170	9	54
Female Illiterate	44	136	109	84	68	294	19	71
Total Workers	102	407	169	206	169	451	48	116
Male Workers	51	209	108	105	86	316	25	73
Female Workers	51	198	61	101	83	135	23	43
Marginal Workers			133	1	4	410	0	101
Marginal Workers M		3	38	1	2	133	0	40
Marginal Workers Fe	0	6	95	0	2	277	0	61
Non-Workers	84	241	203	154	126	514	26	76
Non-Workers M	45	130	107	69	71	257	14	37
Non-Workers Fe	39	111	96	85	55	257	12	39

Figure 19: Break up of literacy and employment of Population in Surrounding Villages (Census 2011).

Population Break up of Tahsil Karsog & District Mandi - (Census 2011).

	Mandi District			Karsog Tahsil		
	Total	Rural	Urban	Total	Rural	Urban
Household	219145	203747	15398	18665	18665	0
Population	999777	937140	62637	93126	93126	0
Male	498065	466050	32015	47122	47122	0
Female	501712	471090	30622	46004	46004	0
Schedule Caste	293739	280580	13159	28351	28351	0
SC_Male	147250	140605	6645	14351	14351	0
SC_Female	146489	139975	6514	14000	14000	0
Schedule Tribe	12787	12359	428	618	618	0
ST_Male	6345	6114	231	325	325	0
ST_Female	6442	6245	197	293	293	0

Figure 20: Population break up of Tehsil Karsog and of District Mandi (Census 2011).

1.2 Socio-Economy of the villages.

Agriculture is the main occupation of the people of the Area. About 67 percent of population directly depends on agriculture for their livelihood. Due to hilly terrain, terraced cultivation is prevalent in the area. Small and marginal farmers predominate. The marginal farmers hardly earn enough to make the ends meet. They work part time as farm labour or in Government departments. There is high rate of migration from these villages for want of employment locally.

Pie chart showing Percentage of literate and illiterate POPULATION in the area Surrounding mine area.

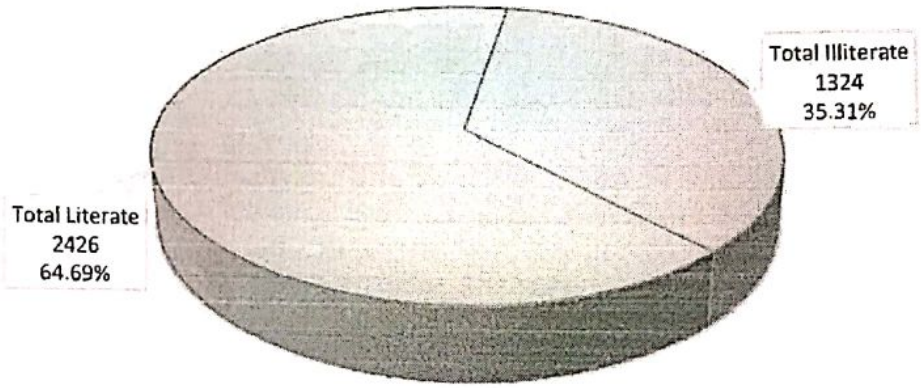


Figure 21 Literacy rate in adjoining villages.

Pie Chart showing Workers, Marginal Workers and Non-workers(unemloyed) in the villages surrounding the Mining Lese Area.

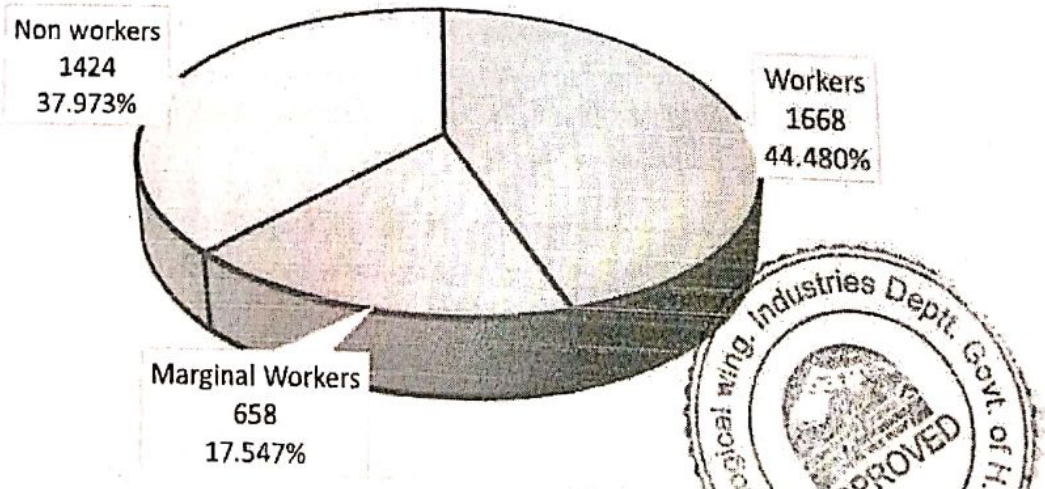


Figure 22 Employment percentage in adjoining villages.

- The figure 21 & 22 depict that though 64.69 percent population is literate but only 44.480 % population has full time employment and 17.547 % are marginally employed.
- Thus, the mining project in the area have various positive impacts in the area. The mining project and *its downstream* projects of transportation and construction activity provide work to as many as 25 persons directly and about 15 persons indirectly. Considered their total minimum earning per day to a tune of Rs. 16000 per day (@Rs.400/= per person per day), the area gets a supplementation in its financial and social wellbeing.

1.3. Land Use Pattern

- The land use pattern of the district is depicted in figure 26.

1) Forest Area.	2) Area under Non-Agricultural Uses
3) Barren & Un-cultivable Land.	4) Permanent Pastures and Other Grazing Land.
5) Land Under Miscellaneous Tree Crops etc	6) Culturable Waste Land.
7) Fallows Land other than Current Fallows.	8) Current Fallows.
9)Net Area Sown	

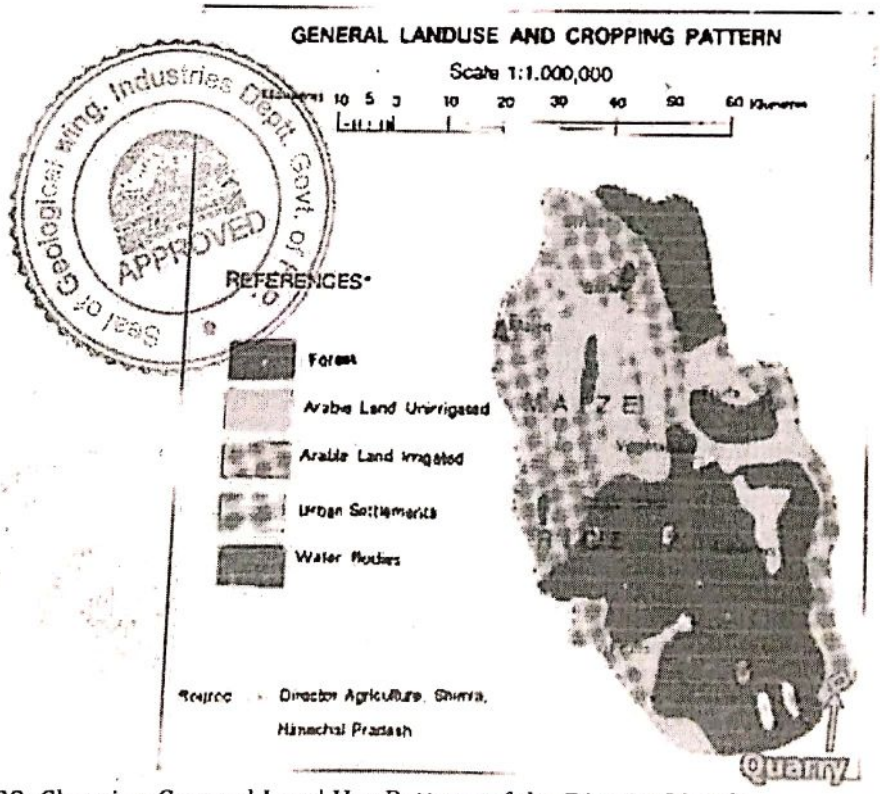


Figure 23: Showing General Land Use Pattern of the District Mandi.

- The general land use and land cover of the Buffer zone of Five kilometres radius is depicted in figure 24.

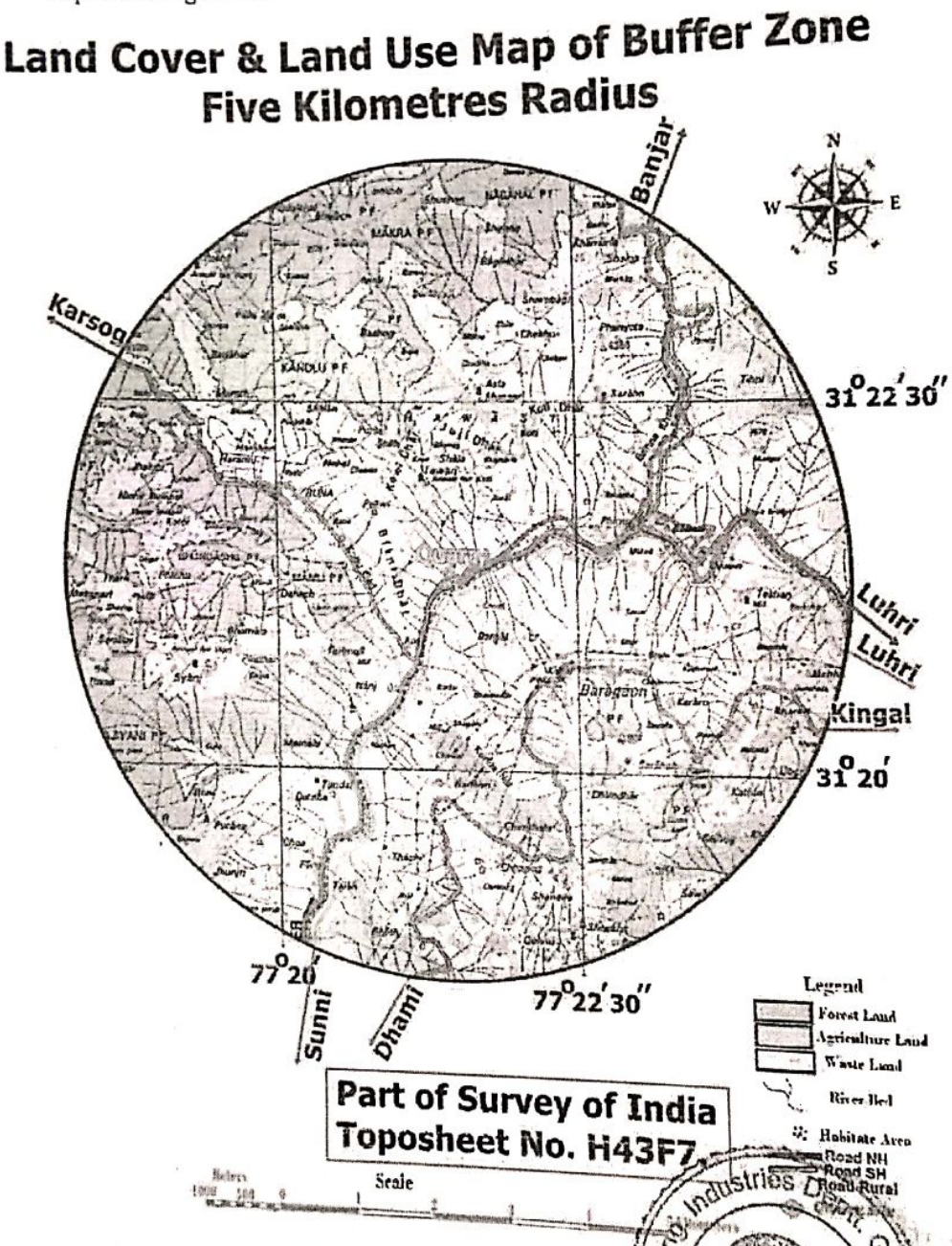
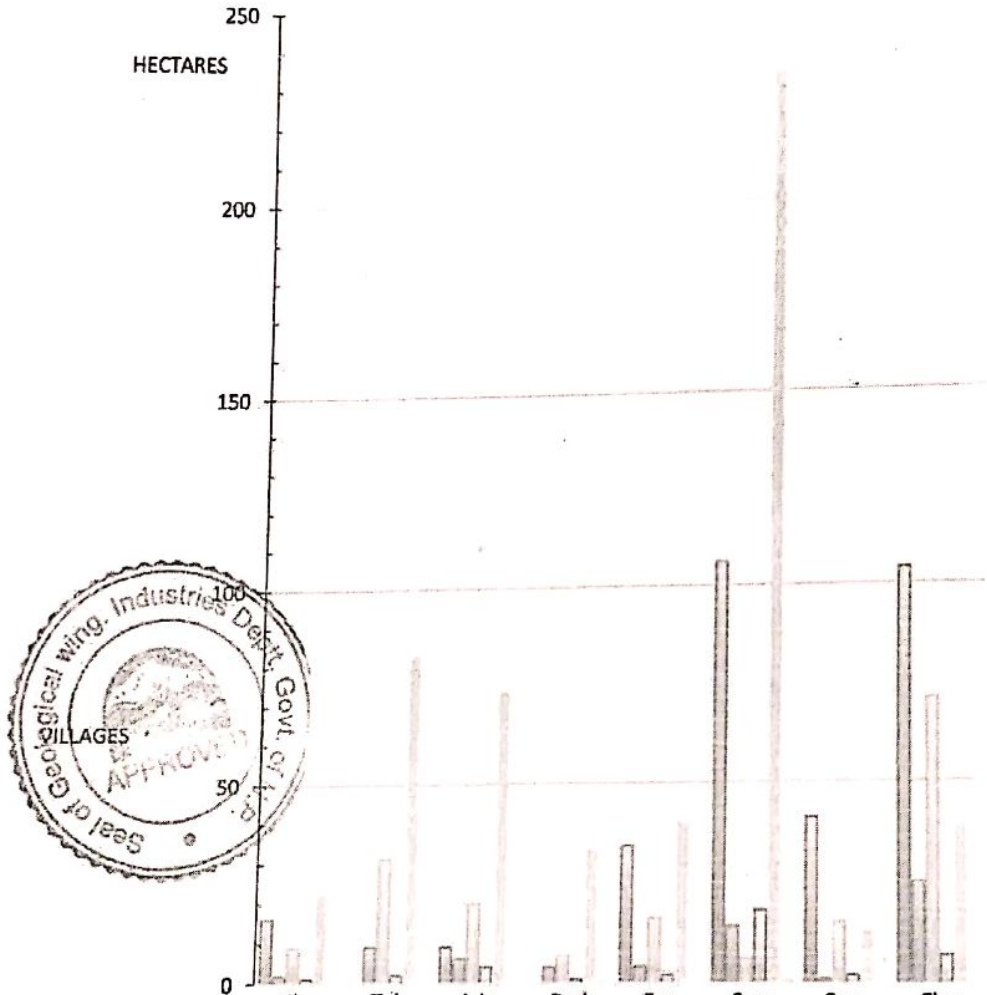


Figure 24: Showing the Five kms Radius Buffer zone.

- The villages surrounding the mining contract area are included in the study of Land use and land cover pattern is given figure 25.

  The data of villages surrounding the mining contract area falling in tehsil Karsog, are considered for study and data is given in figure 26.

Land Use Pattern of Villges Around Mining Lease Area (Census 2011).



	Chebar (565)	Tebban (568)	Jaiyee (570)	Porla (564)	Fanoota (595)	Sarahn (598)	Sarail (569)	Firnu (599)
Forest Area	16	0	9	0	34	106	41	104
Area under Non-Agricultural Uses	2	9	6	4	4	14	1	25
Permanent Pastures and Other Grazing Land Area	9	31	20	7	16	6	15	71
Culturable Waste Land Area	1	2	4	1	2	18	2	7
Total Unirrigated Land Area	22	83	73	33	40	234	13	39
Area Irrigated by Source	0	0	0	1	0	1	0	0

Figure 25: Showing Land Use Pattern of villages around the mining contract area.

Percentage Wise Land Use Pattern of Villages:-Chebar (565) Teban (568) Jaiyee (570) Porla (564) Faneota (595) Sarahn (598) Sarail (569) Firnu (599) -Around Mining Lease Area.

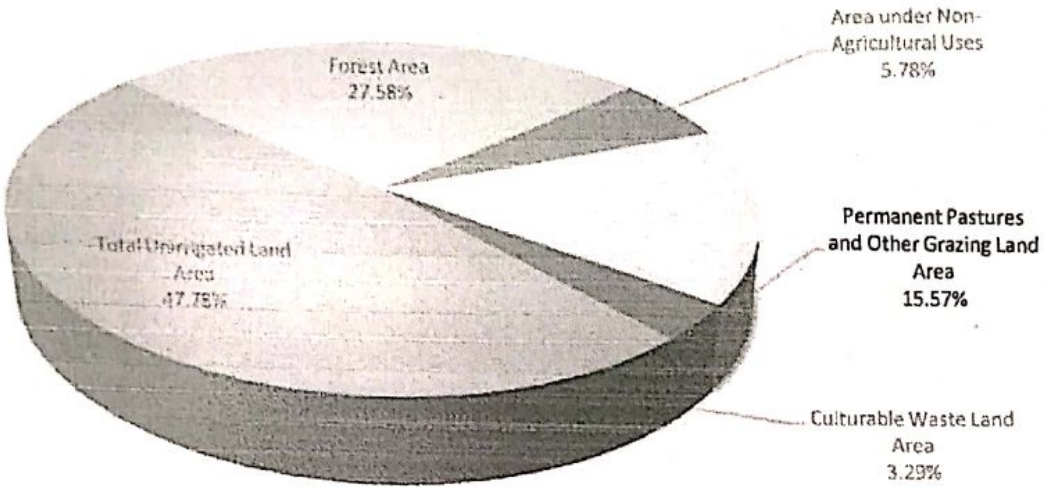


Figure 26Percentage wise land use in surrounding villages.

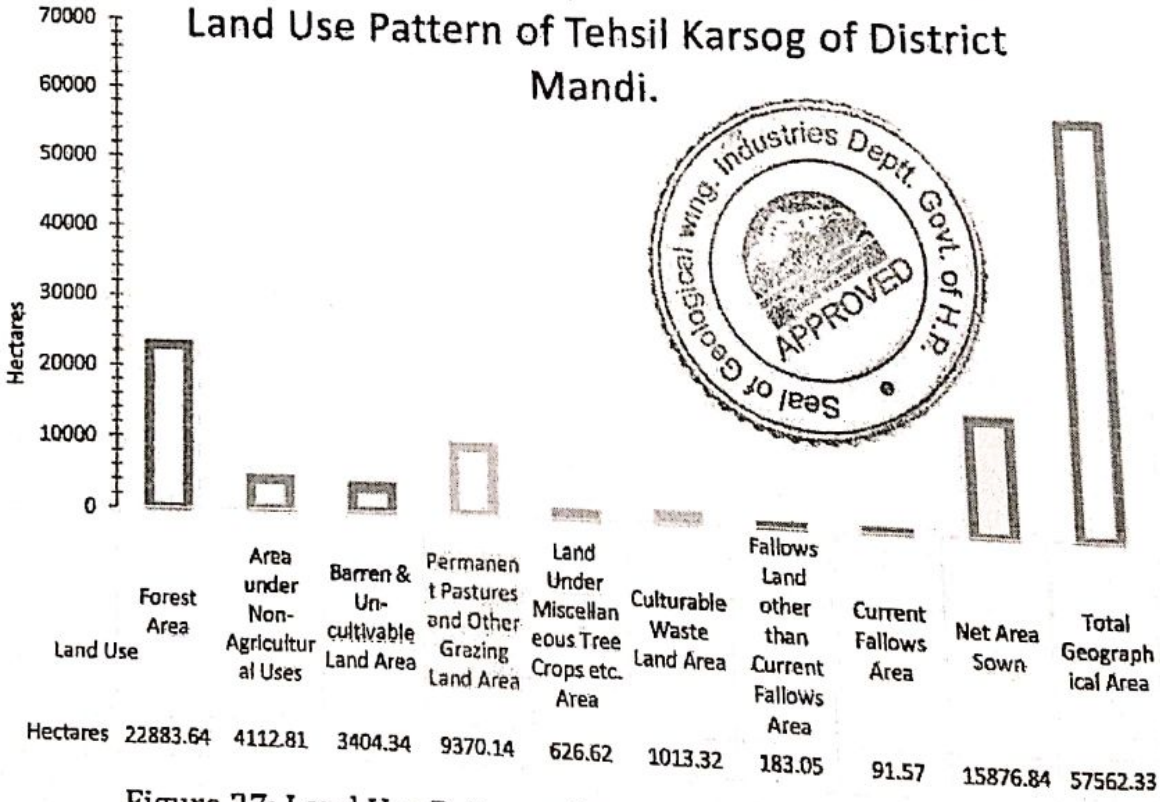


Figure 27: Land Use Pattern of Tehsil Karsog of District Mandi.

1.4 AGRICULTURE: -

The economy of Mandi district is predominately agrarian as around 80 per cent of the total population is dependent on agriculture and activities allied to it for earning their livelihood. The moisture retention capacity of the area is poor due mainly to the fact the bed rocks are argillaceous and the land the uneven. The crops usually face moisture stress during the remaining period of the year due to inadequate and irregular rainfall. The irrigation facilities are provided by lifting water from steams, shallow dug wells and medium to deep tube wells in the valley area.

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

- Lift Irrigation Scheme,
- Kuhls,
- Well used for domestic purposes,
- Well used for irrigation,
- Tube wells/

Major food crops are grouped into three categories:

- Cereals,
- Pulses,
- Other food crops like Chillies, ginger, sugarcane and turmeric.
- Non- food crop area is of two kinds:
- Oil seeds,
- Other non-food crops such as cotton, tobacco and fodder crop,

The area under each category of the crop is given below in figure: -28.
Figure: -29 show production of agriculture produces in district Mandi.
The area under vegetables and their production is given in the figure: -30.

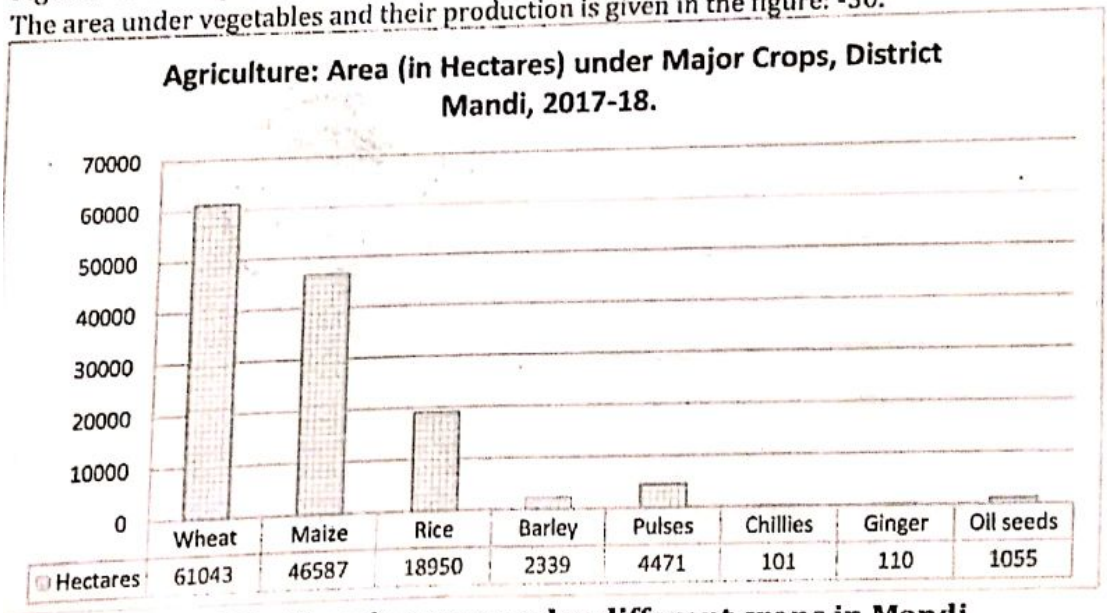


Figure 28: : **Showing area under different crops in Mandi District.**

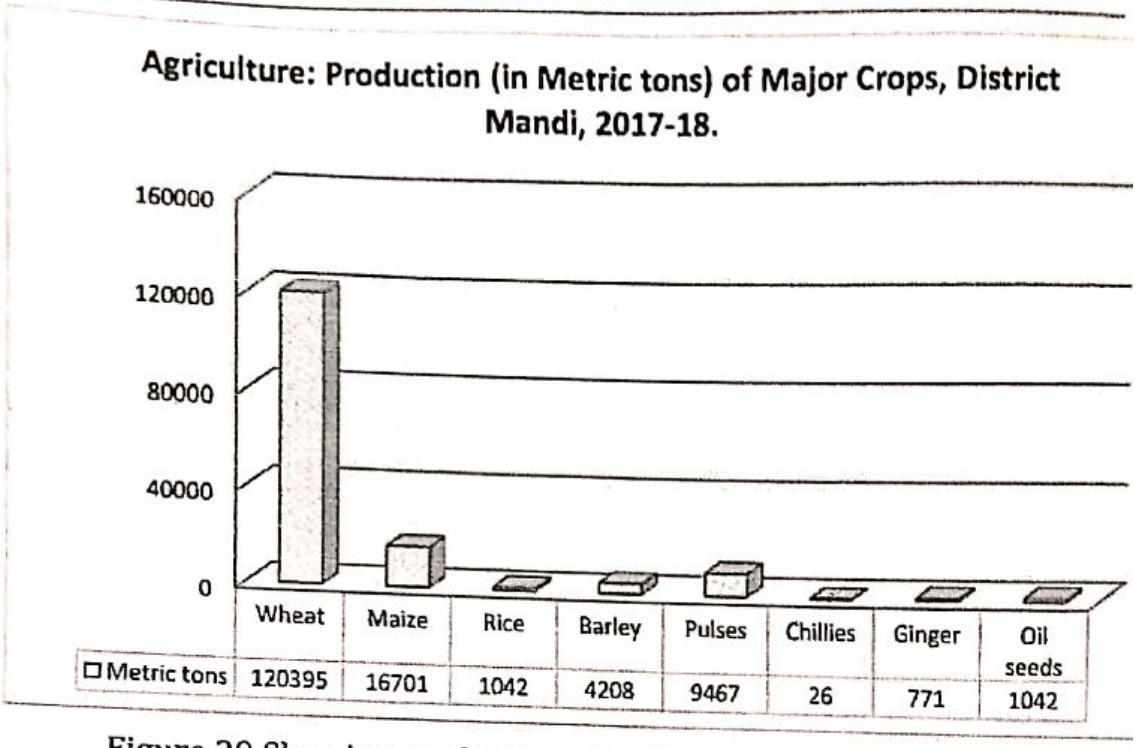


Figure 29 Showing production of each crop in District Mandi.

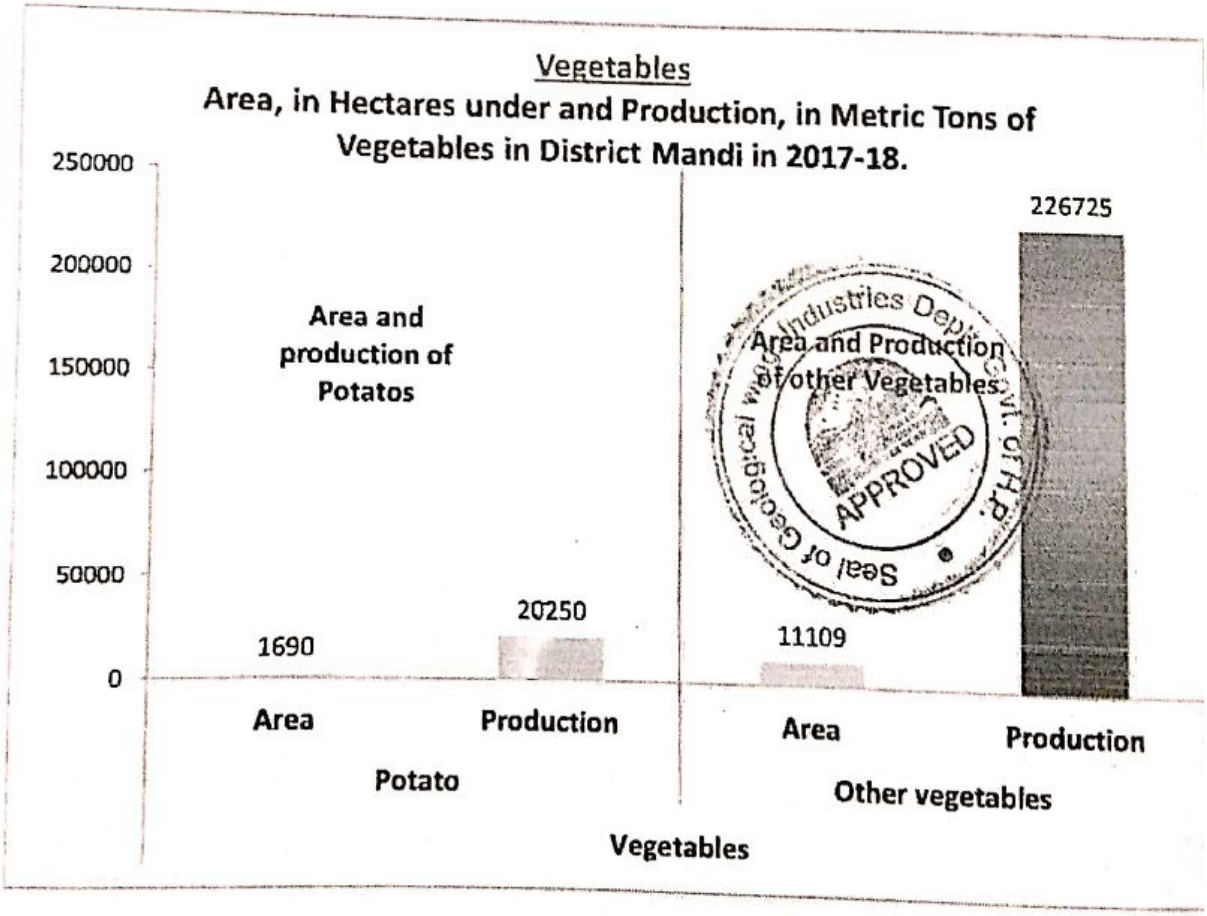


Figure 30: Showing area under vegetable, in Hectare and Production in Metric tons, of District Mandi.

1.5 HORTICULTURE: -

The topography and the agro- climatic conditions of the district are quite suitable for the production of 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 various kinds depending upon the terrain, climatic condition and soil are grown in the district.

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

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

The area under each fruit as well as the production of each fruit in district Mandi are shown in Table 3 as per 2013- 2014 survey.

Table 2; Area under each fruit and their production in District Mandi.

Status of Horticulture
District Mandi.2017-18

Fruit	*Area (In Hectares)*	*Production (In Metric Tons)*
Apple	*16638*	*42078*
Plum	2862	736
Peach	785	440
Apricot	289	290
Pear	1787	1210
Cherry	. 25	6
Green Almonds	0	0
Persimmon	247	88
Olive	8	5
Kiwi	29	17
Strawberry	2	0
O T F	*6034*	*2792*
Almonds	1515	280

Walnut	1059	131
Piccanut	397	19
Nuts & Dry Fruits	***2971***	***430***
Orange	748	253
Malta	27	0
K. Lime	3047	239
Galgal	545	349
Others	3	0
Citrus	***4370***	***841***
Mango	4962	1950
Litchi	531	756
Gauva	687	288
Papaya	25	28
Loquat	4	0
Aonala	152	69
Grapes	2	6
p-gnate	479	196
Jackfruit	186	38
Others	8	
O S T F	***7036***	***3348***

1.6 Animal Husbandry

Economy of the district is predominantly agrarian but role of Animal Husbandry is equally important as the farmers have to keep the cattle for the purpose of ploughing the land 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 Mandi is given in the figure: -31. The population of the Buffaloes and Cattle in District Mandi is given in the figure: -32.

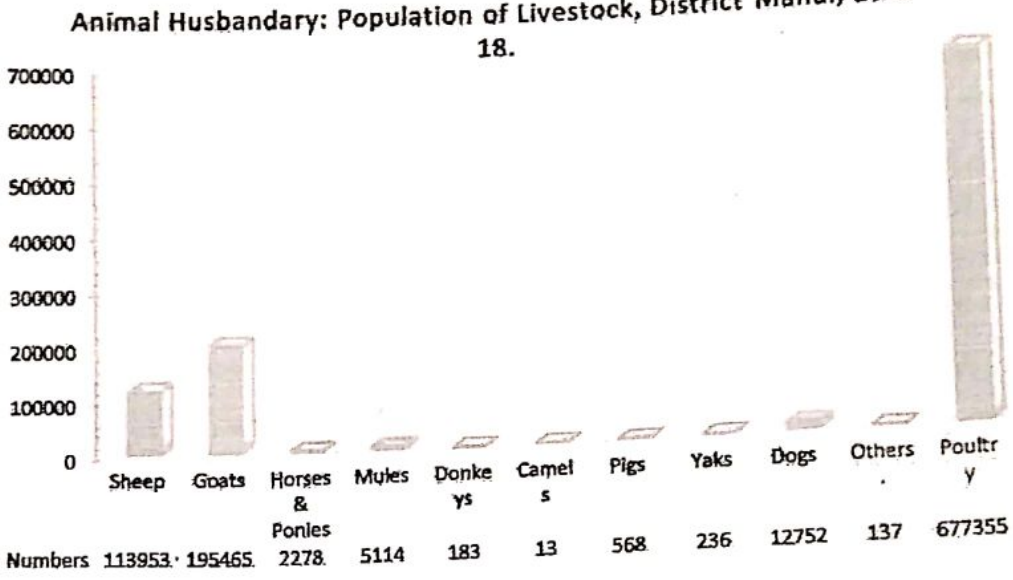


Figure 31: Livestock population of District Mandi.

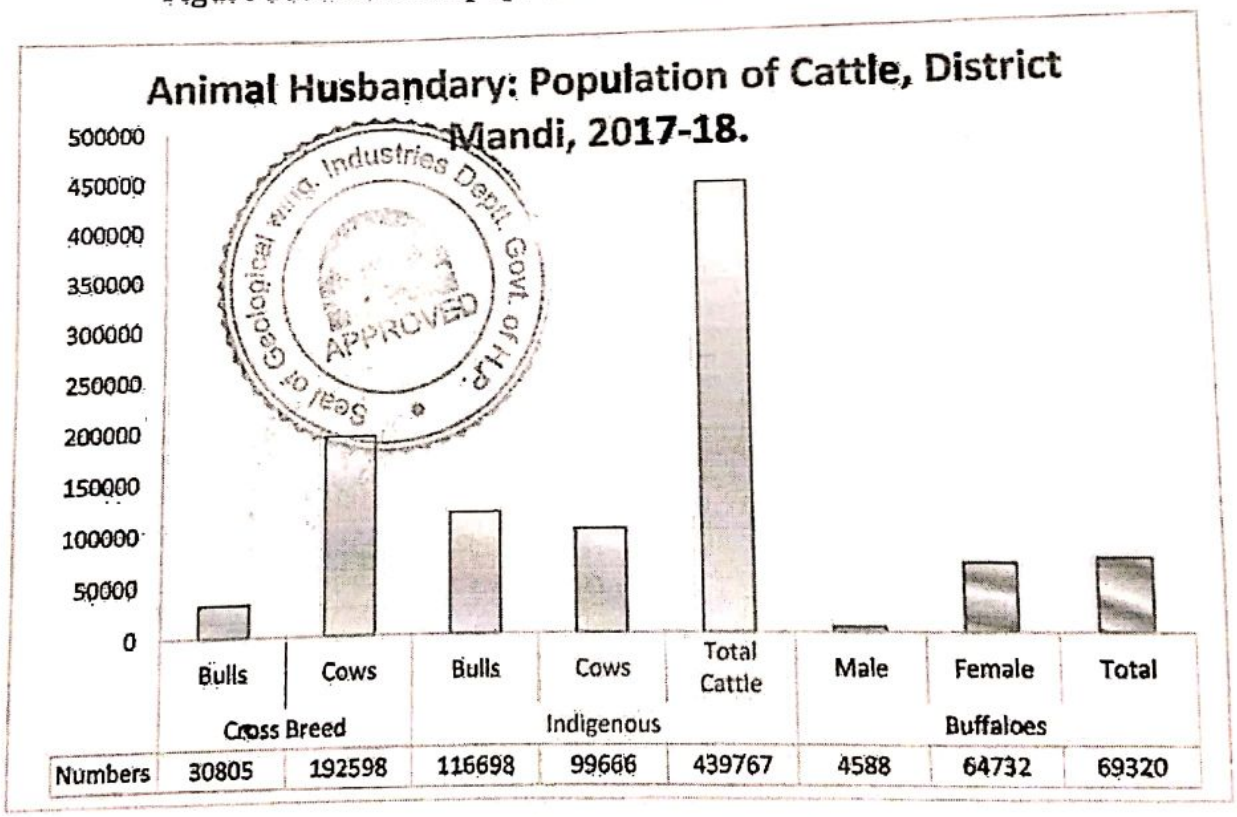


Figure 32: Showing Population of Cattle Buffaloes in District Mandi.

1.7 Fisheries

There is a vast network of perennial rivers, khads and streams in the district. Following prominent of fish family are found in the rivers and streams of Mandi district:

Trout

Mahasir

Gid Seviyon

Dise Gugli and

Mirror Carps

The exotic trought fish species are found in Uhl, Lambadag and Tirthan. A trout hatchery is maintained at Barot. The Mahashir fish is found in river Sutluj near Dehar while Barbustor, Gid, Kuni and Himalayan Barble are found in Uhl and satluj tributaries. River Uhl, Pandoh, Mandi, Kunkatar, Sandhol, Dehar, Barot, Kamand, Balichowki are famous for trought fishing.

No perennial stream passes through the area under consideration.

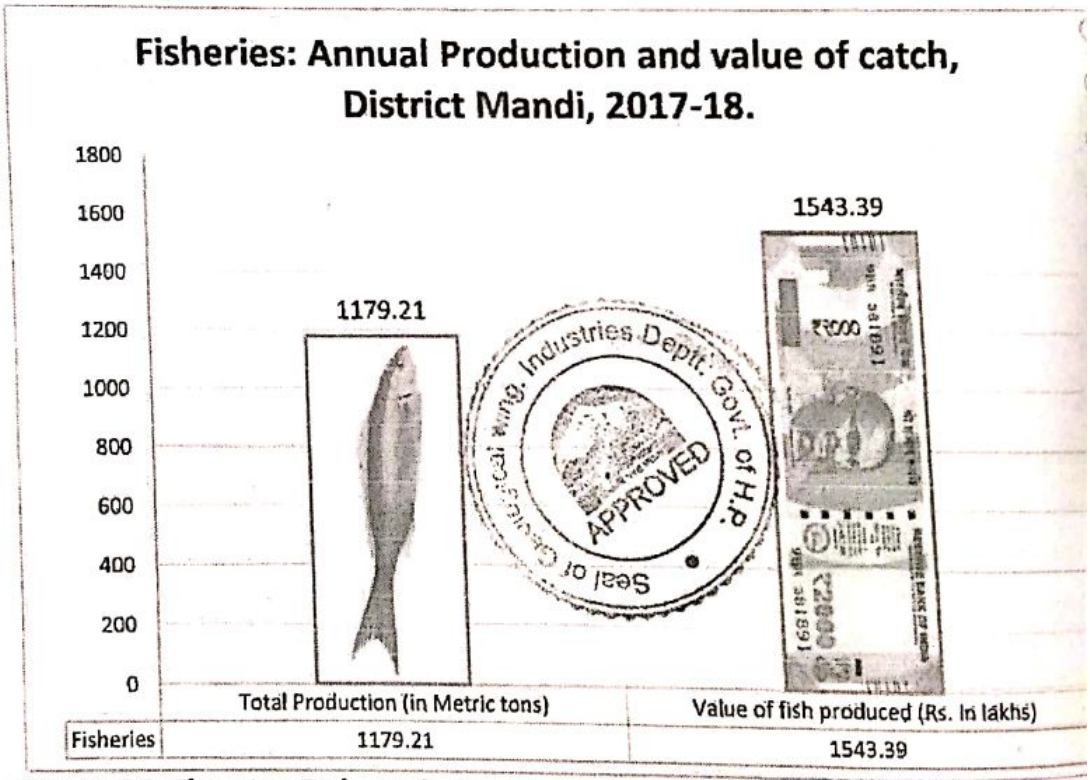


Figure 33: Showing Fish catch / production and its sale value in 2015-16.

1.8 Flora and Fauna

1.8.1 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 Mandi 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 southern boundary of the district is 427 meter above sea level and highest range of is at an elevation of 2658 meters in the north. 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 district are

Simbal (Bombex malabaricum),

Mango (Magniferaindica)

Tun (Cedrela toana)

Several species of acacia and albizia

Salambra (Odina wodier)

Terminalia

Jamun (Engenia jambolana

Largerstour

Bamboo

The common fruit trees are banana, apple, ber, jamun, mango, mulberry, almond, peach etc.

Shrubs

The most common shrub at the higher elevation is Barberis, indigopera and Desmodium and following other shrubs are also found

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

The common fruit trees are banana, apple, ber, jamun, mango, pear, mulberry, apple, almond, cherry, peach etc.

1.8.2 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 throughout the district. Barking dears and gural are found at medium elevation the musk deer or Kastura and serao are found in the district. Common Mammals & Birds in the Mandi District is given in the Table :-7

Table 7: Common mammals and birds in the Mandi District.

Table 3

Birds		
Zoological Name	**English Name**	**Common Name**
Milvus migrans	Vulture	Cheel, Gidh, Eell
Eudynamys scolopacea	Koel	Koel
Columbia livia	Pigeon	Kabuttar
Coracias bengalensis	Blue jay	Nilkantha
Columa livia	Hawk	Baj
Francolins francolinus	Black partridge	Kala Tittar
Francolius pondicerians	Grey partridge	Safed Tittar
Pavo crisslatus	Peacock	Mor
Coturnix coturnix	Common quail	Bater
Alectoris graeca	Chakor	Chakor
Crovus splendens	Crow	Kanwa
Prottacula Karneri	Parrot	Totra
Tragopan melanocephalus	Western horned Tragopan	Phulgar/Jujurana
Picoides macei	Fulvourbreasted Pied Woodpecker	Kathfowra
Streptopelia decaocto	Ring dove	Gughi
Streptopelia chinesis	Spotted dove	Gughi
Accipiter badius	Shikra	
Aquila rapax vindhian	Tawny eagle	
Ducula bicolor	Green Pigeon	

Parus rufonuchalis	Tits	
Picus canus	Black napped Woodpecker	Woodpecker
Dryocopus javensis	Woodpecker	
Muscicapa subrubra	Himalayan Fly Catcher	
Acidotheres tristis	Common Myna	Ghatari
Terpsiphone paradisi	Paradise flycatcher	Choti- Pinja
Passer domesticus	House sparrow	
Carduelis spinoides	Himalayan Green Finch	Chiria

Table 4

Mammals in Mandi

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

In the area surrounding the mining contract following are the common birds: -

- Chakor
- Crow
- Red Jungle Fowl (Jangli Murga)
- Black Partridge (Kala Titar)
- Grey Partridge (Safed Titar)
- Woodpecker

In the contractd out area and surrounding hills following are the common animals: -

- Leopard (Bagher)
- Hare
- Wild Bore (Jangli Soor)
- Jackal
- Barking Deer (Kakkar)
- Monkey
- Sambar
- Pig

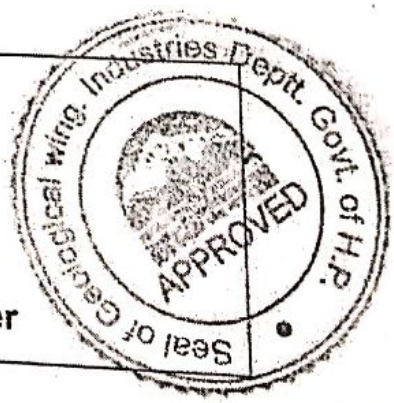
1.9 Climate

The climate of district is hot in summer as it is situated in valley at lower altitude while surrounding mountains top experience pleasant weather and cold in winters. Monsoon brings plenty of rain from July to September. October to November is pleasant weather, during this time Lake is completely full. Hottest months are May and June when temperature usually hover around 37-38 degree Celsius and sometimes for few days jumping to above 40 degrees Celsius, the nights are comparatively cooler and month wise temperature is given in figure 7.

The area enjoys monsoon rainfall from third week of June to mid-September. The rainfall records available with the District Collectors office from 2004 to 2014 are depicted in the figure 8.

The climatic information given is based on the data obtained from Revenue Department of Himachal Pradesh. The Indian Meteorological Department is maintaining a Meteorological Station at D.C office Mandi, and at Sundernager. All information available indicates following seasons in the District:

Winter	**Dec. – March**
Summer/Pre-monsoon	**April- May**
Monsoon June-	**September**
Post Monsoon/ Autumn	**October- November**



2.0 IMPACT OF MINING ACTIVITY & CONTROL MEASURES

The impact on environment due to mining operation is generally: -

- Change in Topography& land use pattern.
- Effect on Flora & Fauna

- Ground Vibrations and Fly Rocks.
- Effect on Hydrology
- Effect on Climate
- Air Pollution
- Noise Pollution
- Visual Impact
- Socio- economic Impact
- Accumulation of Scree.

2.1 CHANGE IN TOPOGRAPHY.

IMPACT

- The contract area is part of sub Himalayan range.
- It is part of a sloping ridge.
- The highest contour of the contract area is at 812 metre above mean sea level.
- The lowest point is at 760 m above MSL.
- Mine will be opened from the top.
- Mining waste would be about five percent of the mined material.

MITIGATION

- ❑ During initial period, waste would be stored along safety zone.
- ❑ After first bench progresses the waste would be spread over the worked-out part of the bench.
- ❑ Similarly, the waste would be spread over one after other bench as work progresses and terrace of flat land will be formed.
- ❑ Post mining operation area would be afforested.

2.2 IMPACT ON LANDUSE AND MITIGATION MEASURES

IMPACT

- Most of the mining contract area is devoid of any vegetation. The land use of the mining contract area is defined in the Revenue record as 'Banjar' but having only small bushes as the area is rocky. The land under active mining would be degraded as far as present land use is concerned. The undulating and inclined old Terraces would become steps like terraced hill slopes culminating into leveled terraces at ultimate pit level.

MITIGATION MEASURES

- The worked-out mining benches would be suitably planted with local shrub and bushes.
- Plantation on the peripheral safety zone of the contract area would be taken up to enhance the green cover, stabilize the soil, check the soil erosion, to act as curtain for the degraded acsthetic visual pollution and arrest the water runoff.
- After the land is stabilized afforestation work will be undertaken.

3.3 EFFECT ON FLORA & FAUNA

FLORA

- The mining contract area is predominantly barren land with small grass growing in small patches though classified as 'Banjar' in the revenue record.

- The entire transportation of mined stone would be manually to the nearest road head, *therefore* there is no likely hood of any adverse effect of any chemical pollutants on flora of the area.

FAUNA

- There are hardly any animals reported from the mining area.
- The adverse impact on fauna is mainly due to:
  - Human activity;
  - Noise;
  - Land degradation; and
  - Deforestation.

MITIGATION MEASURES

Rather, the present haphazard growth of the flora would be supplemented by systematic plantation of bushes and trees more suitable for arresting the soil erosion and propagation of local beneficial flora and fauna.

2.4 GROUND VIBRATIONS AND FLY ROCKS.

- ✔ Nil
- Because no blasting is involved.

2.5 EFFECT ON HYDROLOGY AND GROUND WATER

IMPACT

- The mining area is part of dissected hill range as per the hydro-geological conditions prevailing in the area and poor in ground water occurrence.
- The mining area being a ridge, the ground water is quite deep in the area to be impacted by mining.
- There is no surface drain in the contracted area.

MITIGATION MEASURES

- The mining benches would be little inclined towards the mine wall.
- The freshly mined rocks would expose the joints and fissures in the rock and these would facilitate the rain water infiltration; thus, reducing the runoff water.
- Whatever little surface water during rains may flow down with loosened waste material and dust will be trapped at the check dams created in the down slope.
- After monsoons, this will be removed and spread over the abandoned benches.
- Abandoned benches would be adequately planted with fast growing local shrubs and bushes to consolidate the disturbed surface.
- Afforestation of worked out benches would be taken up with minimum gap between the excavation and reclamation to fix the ground and stem the velocity of the rain water flow.

2.6 EFFECT ON CLIMATE

CLIMATE

- The mining contract area is very small hardly 0.6545 hectares.
- The mining will be confined from bench at 812 metres MSL to 760 m MSL.
- Some micro level impact near the freshly exposed surface may happen for short duration.
- The impact will need no mitigating measures.

2.7 AIR POLLUTION

IMPACT

- 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 totally manual mining activity will be limited to excavation of about 76 metric tons per day, as such there will be hardly any noticeable impact on air quality.

MITIGATION MEASURE

- A dense green belt around the periphery of the mining area would be developed.
- Plantation of broad leaf trees /bushes to filter out dust and preventing it from spreading out, would be undertaken in the worked-out benches.
- Dust mask provided to the workers engaged at dust generation positions whenever necessary.

2.8 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 labour engaged in cutting and shaping of stone with chisels.

MITIGATION MEASURES

- A thick belt of broad leaf trees, bushes and shrubs would be planted around the periphery of mine to screen the noise.

2.9. ACCUMULATION OF SCREE

- The mine waste would be arrested from flowing down the slope by check walls /retaining structures.
- The waste would be spread over the mined parts of the benches and leveled at the check walls.
- No dumping on the slope is involved.

2.10 VISUAL IMPACT

✔ Subject to individual

➢ Nil; though the shape of old Terrace will be disturbed a small extent but post reclamation plantation and afforestation would give soothing visual impact.

2.11 SOCIO- ECONOMIC IMPACT

- 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.

- No adverse impact on the socio-economic condition of the area is envisaged.
- **The figure 21 & 22 depict that though 64.69 percent population is literate but only 44.480 % population has full time employment and 17.547 % are marginally employed.**
- **Thus, the mining project in the area have various positive impacts in the area. The mining project and *its downstream* projects of transportation and construction activity provide work to as many as 25 persons directly and about 15 persons indirectly. Considered their total minimum earning per day to a tune of Rs. 16000 per day (@Rs.400/= per person per day), the area gets a supplementation in its financial and social wellbeing.**

2.12 Transportation

The mine contract has been granted for open sale. The maximum daily production will be 135 tonnes per day. The MDR 21 road of 33 kilometers leading to Karsog will be able to bear this extra traffic of about 15 tipper trips a day. The figure 17 show the evacuation route of 30 metres from quarry to MDR 21 on Google map.

PART III

1 Progressive Mine Closure Plan/Reclamation Plan

1.1 RECLAMATION

- The mined area being part of the old Terrace and can be put to fruitful use after the mining operations are over.
- The open cast mining will create sort of terraces of levelled land suitable for plantation.
- Growth of vegetation in the mining area has been planned by ensuring rehabilitation of the completely excavated area at the earliest by reducing the gap between the first damage (due to mining activity) and the first repair (reclamation), to the minimum.
- The Mining area will be extensively planted with fast growing plants in consultation with Forest Department.

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 old Terrace mining.

- Mine waste (clay mined which cannot be used commercially and would not be removed from the mining area).e

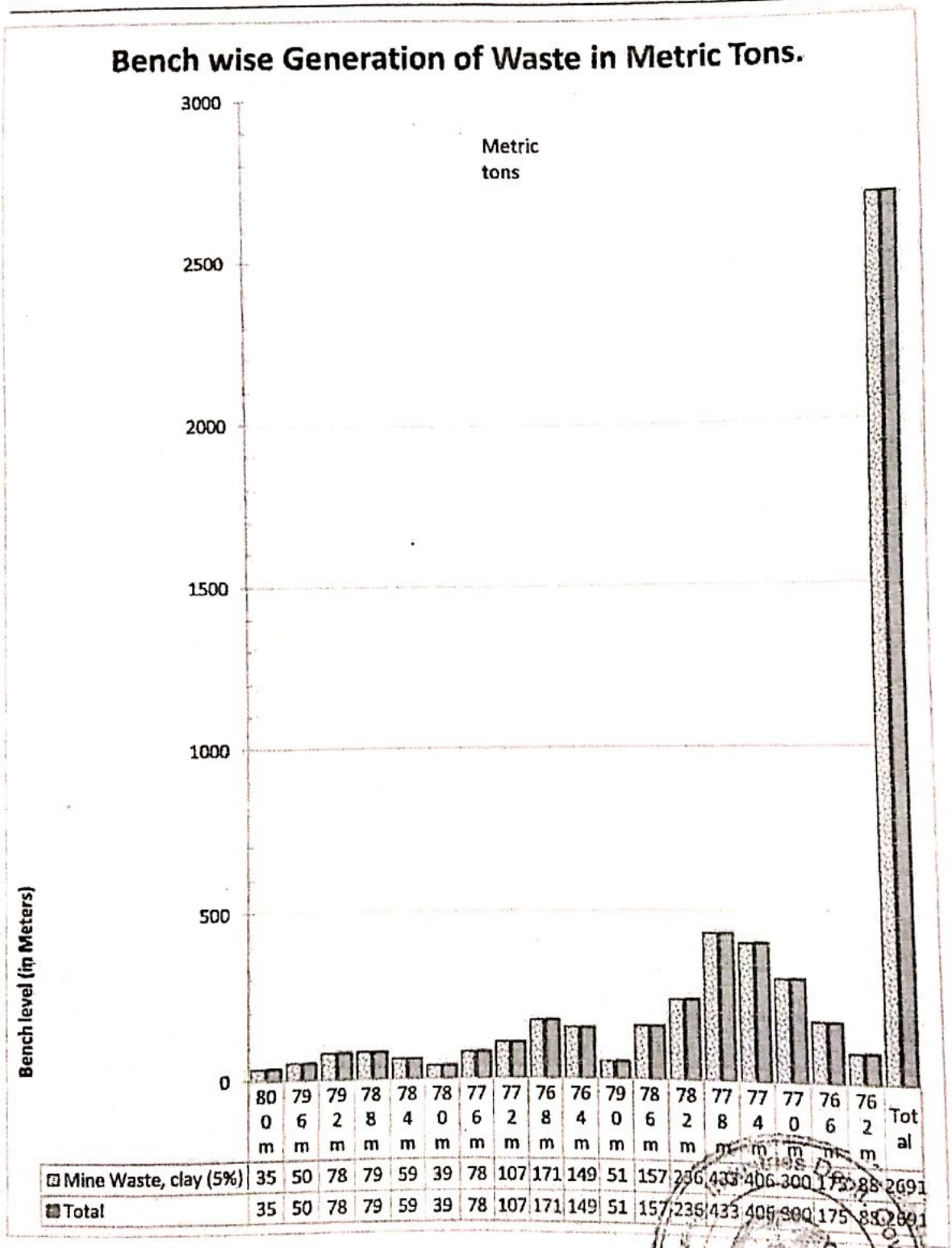
b) Year wise disposal of waste and soil cover:

During the opening of mine at the first bench, the mine waste will be dumped temporarily over the safety zone. As the work on the bench proceed the mine waste will be spread over the exhausted part of the bench.

In two years, 2691 metric tons of mine waste clay will be generated while mining stone, sand & bajri. This will be left in the exhausted benches. The waste will be spread over the exhausted and abandoned benches. The soil cover at present is very thin negligible veneer. It will be removed from the surface when the mining of bench is started and spread over the mine waste in the preceding bench to enrich it.

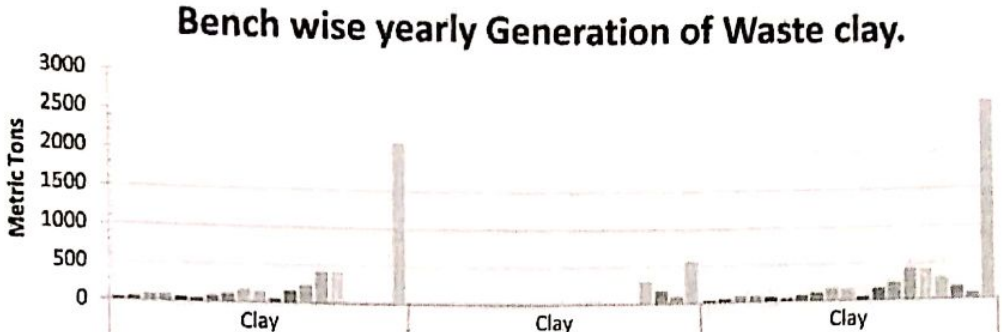
c) Cost of the mine waste disposal scheme.

As the mine waste, are not required to be moved away from the mining benches therefore no cost is likely to be incurred, for its disposal. As it will be separated during mining operation while extraction of RBM and its simultaneous disposal will be part of mining cost.



	800m	796m	792m	788m	784m	780m	776m	772m	768m	764m	790m	786m	782m	778m	774m	770m	766m	762m	Total
Mine Waste, clay (5%)	35	50	78	79	59	39	78	107	171	149	51	157	236	433	406	300	175	88	2691
Total	35	50	78	79	59	39	78	107	171	149	51	157	236	433	406	300	175	88	2691

Figure 34: Total waste expected to be generated in up to the ultimate pit proposed.



	Clay First Year	Clay Second Year	Clay Total
800 m	35		35
796 m	50		50
792 m	78		78
788 m	79		79
784 m	59		59
780 m	39		39
776 m	78		78
772 m	107		107
768 m	171		171
764 m	149		149
790 m	51		51
786 m	157		157
782 m	236		236
778 m	433		433
774 m	406		406
770 m		300	300
766 m		175	175
762 m		88	88
Total	2128	563	2691

Figure 35: Year wise generation of waste and removal of topsoil.

1.3 Top soil utilization, if any,

As the mining area is part of old Terrace and rocky, it is having very thin negligible veneer of soil cover. The little topsoil that will be removed along with waste clay and spread over the exhausted benches as explained above in para 9.2 and data shown in figures 34 and 35.

1.4. Preventive Check dams

Eventually the mining area will form terraced eighteen benches and flat ultimate pit base, but during mining to check flow of mine waste in the form of scree

flowing down the slope initially small check dams as part of mining operation will be erected to check the flow of scree from the mining area. Simultaneously, a retaining wall near the lower contour will be erected so the no scree roll down outside the mining contract area towards adjoining fields. The check dam / retaining wall on the edge of the ultimate pit would be one and a half a metre in height and half a metre width and made with stones of the contract area.

Year wise details of check dam to be constructed. And year wise cost of construction of these check dams is given below.

Year	Number of check dams/Retaining Walls	Length (In meres)	Cost (I Rs)
First	1	7	20000
Second	1	7	20000
Total	2	14	40000

1.5 Plantation work (See Plate 3)

The entire mining contract is Private land thus plantation of trees in the area is good Working option for its reclamation.

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	200	10	4000
Second	300	15	4800
Total	500	25	8800

Year wise survival rate.

The survival rate is about 40 percent in the area because of the sandy and rocky nature of the soil. 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 two years, the survival rate will be ensured to be at least 90 percent.

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

There is MDR 21 passing downhill of the auctioned area. Adequate safe buffer zone has been provided for its protection.

3 MANPOWER DEVELOPMENT

The mining activity will be mainly manual. Worker are mainly required in old Terrace mining for extraction and loading of mined material in to tipper trucks 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
Unskilled /skilled workers	24

Thus total generation of Employment will be to a tune of 25 both skilled and unskilled workers.

4 USE OF MINERAL

The stone will be used as raw material for use in captive stone crusher to be set up, for consumption in the construction and building industry.

5 DISASTER MANAGEMENT & RISK ASSESSMENT:

The mining contract area part of old Terrace 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:

- Landslide
- Accident during mineral loading, transporting and dumping
- Accident due to vehicular movement
- Earthquakes

Landslide

The area is made up of river borne material. Therefore to avoid the sliding of pit walls during mining, the height of bench would be maintained to four metres only. As per mining plan the mining work will not be carried out during monsoon season when the wet rock is most likely to slide.

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 IV. The mining operations are open cast pit mining. The mining pits will be only of four 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 would and tin sheets.

RECOMMENDATION FOR RISK REDUCTION

Measures to prevent Inundation/Flooding/drowning

- Being on old Terrace of consolidated RBM there would be no mining operation during monsoons or rainy day, as the wet loosed rocks are prone to uncontrolled slide.
- Height of benches would be restrained to four metres.

Measures to Prevent Accidents during Loading

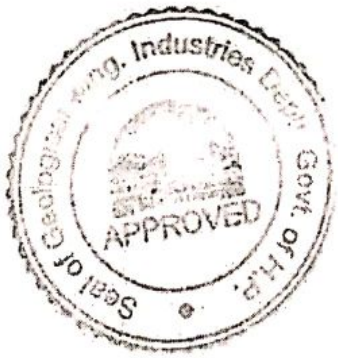
- The truck should be brought to a lower level so that the loading operation suits to the ergonomic condition of the workers.
- The loading should be done from one side of the truck only.
- The workers should be provided with gloves and safety shoes during loading.
- Opening of the side covers would 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 approach to the mining pit/bench would be properly maintained.
- The truck would be covered and maintained to prevent any spillage;
- The maximum permissible speed limit of 15 kms would be ensured;
- The experienced 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 of Minor Mineral contract for Stone, bajri & sand, situated in Khasra Nos. 495/60/1 & 549/1/1, area measuring 8-01-15 Bigha (0.6545 hectares), Mauza Firnoo, Tehsil Karsog & District Mandi, 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

Seal of Geological wing, Industries Dept. Govt. of H.P.
APPROVED

Ved Kumar
Village Firnoo & P.O. Sarahan,
Tehsil Karsog & District Mandi,
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 contract for Stone, sand & bajri situated in Khasra No. 495/60//1 & 549/1/1 area measuring 8-01-15 Bigha (0.6545 Hectares), Mauza Firnoo, Tahsil Karsog & District Mandi, of Shri Ved Kumar, Village Firnoo, & Post Office Sarahan, Tahsil Karsog & District Mandi, 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

Seal of Mining Wing, Industries Dept. Govt. of H.P. APPROVED

SUBHASH SHARMA
No.HP/RPQ/01/1/2004