

DISTRICT SURVEY REPORT

FOR SAND MINING

DISTRICT TARNTARAN
MINING DIVISION, TARNTARAN
DEPTT. OF MINES AND GEOLOGY, PUNJAB



PREFACE

In Compliance to the notification issued by the Ministry of Environment , Forest And Climate change dated 15.01.2016 , the preparation of District Survey Report of river bed mining and other minor minerals is in accordance with appendix 10 of the notification . It is also mentioned here that the procedure of preparation of District Survey Report is as per notification guidelines. Every efforts have been made to cover sand mining locations, areas & overview of Mining activity in the district with all its relevant features pertaining to geology & mineral wealth in replenishable and non-replenishable areas of rivers, streams and other sand sources. This report will be a model and guiding document which is a compendium of available mineral resources , geographical set up , environmental and ecological set up of the District and is based on data of various departments , published reports , and websites. The data may vary due to floods , heavy rains and other natural calamities. Therefore , it is recommended that Sub Divisional Level Committee may take into consideration all its relevant aspects / data while scrutinizing and recommending the application for EC to the concerned Authority.



Overview of Mining Activity

SURVEY REPORT OF DISTRICT TARNTARAN

As per Gazette notification of 15th January 2016 of Ministry of Environment, Forest and Climate Change a Survey shall be carried out by the District Environment Impact Assessment Authority (DEIAA) with assistance of Irrigation department, Drainage department, Forest department, Mining department and Revenue department in the district for preparation of District Survey Report as per the sustainable sand mining guidelines to ensure identification of areas of aggradations or deposition where mining can be allowed; and identification of areas of erosion and proximity to infrastructural structures and installations where mining should be prohibited and calculation of annual rate of replenishment and allowing time for replenishment after mining in that area.

Every efforts have been made to cover sand mining locations, areas & overview of Mining activity in the district with all its relevant features pertaining to geology & mineral wealth in replenish-able and non-replenish-able areas of rivers, stream and other sand sources. The mineral potential is calculated based on field investigation & geology of the catchment area of the river or streams. Also as per the site conditions and locations, depth of minable mineral is defined. The area for removal of the mineral in a river or stream is decided depending on geomorphology & other factors, it can be 50% to 60% of the area of a particular river or stream. Other constituents like clay and silt are excluded as waste while calculating the mineral potential of particular river or stream. This District Survey Report shall form the basis for application for environment clearance, preparation of reports and appraisal of projects. The report shall be updated once every five years.

1. INTRODUCTION :-

Tarn Taran district is one of the districts in the state of Punjab in North-West Republic of India. The main cities are Tarntaran Sahib and Patti. The City of Tarn Taran is a holy place for Sikhs.

Tarn Taran district was formed in 2006 from Amritsar District. The declaration to this effect was made by Captain Amarinder Singh, Chief Minister of Punjab, during the celebrations marking the martyrdom day of Sri Guru Arjan Dev Ji. With this, it became the 19th district of Punjab. Tarn Taran Sahib which is located near Amritsar and Patti City of Tarn Taran is a holy place for Sikhs of India and abroad. Tarn Taran district is surrounded by Amritsar district in the north side and Firozpur district in the south side. Its boundary is adjacent to Kapurthala district in the east and it is bounded by Pakistan in the west. District covers the 2449 sq kms area.

This town was founded during 1590's by the fifth Sikh Guru, Shri Guru Arjan Dev Ji and He laid the foundation of Gurudwara Sri Darbar Sahib (Gurudwara Tarn Taran) in the heart of the town. During 1716 – 1810, Tarn Taran was ruled by the strong Sikh Family of Dhillon Clan and was the part of Bhangi Sikh Dynasty. During 1980-90, Post independence - 1947, Tarn Taran became the region of Punjab and it has the majority of Sikh inhabitants. In 2006, Tarn Taran was formed as a separate (19th) district of Punjab withdrawing it from the Amritsar district.

2. PHYSICAL FEATURES & GEOGRAPHICAL AREA:

Tarn Taran district lies between 31° 05', and 31° 30' 05" north latitude and 74° 30' and 75° 15' 05" east longitudes. The area falls in Survey of India toposheet Nos 44-I & 44-M. It has a geographical area of 2449 sq. km. It is bounded by Amritsar district in the north, Kapurthala district in the east, Pakistan in the west and Ferozepur district in the south. The area is well connected by roads and railways. National highways 1, 1-A, and 15 pass through the area and connect the important towns falling in the tract. Major towns are connected with broad gauge line of Northern Railways run through Khem Karan- Patti- Tarn Taran to Amritsar, Tarn Taran to Goindwal Sahib & Goindwal Sahib to Beas on main railway line . Tarn Taran is one of the border districts which lies in the North West frontier of Punjab and is bounded by district Amritsar in the north east, district Kapurthala in the east and district Ferozepur in the south. The District has about 240 km international boundary with Pakistan . It is bounded by river Beas in the south eastern side. Harike Wetland, also known as "Hari-ke-Pattan", with the Harike Lake in the deeper part of it, is the largest wetland in Asia falls in the Tarn Taran district of the Punjab. The wetland and the lake were formed by constructing the head works across the Sutlej river in 1953. The headworks is located downstream of the confluence of the Beas and Sutlej rivers

Harike International Wetland:



Harike Wetland is situated about 35 kms south of the Tarn Taran town on the NH 15 towards Ferozepur. It is the largest wetland in the northern India and is the most important sanctuary in the State. Hari-ke-Pattan is a natural serene place famous for its bird sanctuary. A number of globally threatened species have also been recorded in Harike. This type of habitat is not met anywhere in Punjab. The shallow reservoir was created in 1953 by the construction of a barrage at the confluence of the Sutlej and Beas rivers. Harike Lake was declared as a 41 sq km wide wildlife sanctuary in 1982. This wetland can be explored for giving the town an identity as a tourist and recreational spot. With availability of such resource in proximity, the town has tremendous growth potential in terms of tourism. Migratory birds about 350 odd species, coming from far flung lands of China, Siberia, Afghanistan and Pakistan, making it a popular place for bird watching and boating, characterize winter (November onwards). Hari-ke-Pattan is also one of India's leading in-land sweet water fish market.

BRIEF DETAIL OF TARNTARAN DISTRICT

NAME OF DISTRICT	AREA (PER SQ. KM)	POPULATION	DENSITY (PER SQ. KM)
TARNTARAN	2449	1119627	464

Tehsils (Total : 4)

SR. NO.	NAME OF TEHSIL
1.	TARNTARAN
2.	PATTI
3.	KHADOOR SAHIB
4.	BHIKHIWIND

Blocks (Total : 8)

SR. NO.	NAME OF BLOCKS
1.	BHIKHIWIND
2.	CHOLA SAHIB
3.	GANDIWIND
4.	KHADUR SAHIB
5.	NAUSHERA PANUAN
6.	PATTI
7.	TARN TARAN
8.	VALTOHA

Municipal Councils (Total :6)

SR. NO.	NAME OF MUNICIPAL COUNCIL/ NAGAR PANCHAYAT
1.	PATTI
2.	TARN TARAN
3.	BHIKHIWIND
4.	KHEMKARAN

Population :

In 2011, Tarn Taran had population of 11,19,627 of which male and female were 5,89,369 and 5,30,258 respectively. In 2001 census, Tarn Taran had a population of 9,39,057 of which males were 4,97,768 and remaining 4,41,289 were females. Tarn Taran District population constituted 4.04 percent of total Maharashtra population. In 2001 census, this figure for Tarn Taran District was at 3.86 percent of Maharashtra population.

There was change of 19.23 percent in the population compared to population as per 2001. In the previous census of India 2001, Tarn Taran District recorded increase of 16.26 percent to its population compared to 1991.

3. PHYSIOGRAPHY

Physiographically the district represents alluvial plain. The topographic gradient is about 0.4m/km in the district. The district falls in Ravi sub basin, Beas Sub basin and Sutlej sub basin of Indus Basin. The area of the district in Ravi sub basin in the northern part of the district is 1440 sq. Km. Whereas Beas sub basin in the central part of the district covers an area of 783 sq. Km. Sutlej sub basin covers an area of 361 sq km in the eastern part of the district.

4.RIVER SYSTEM

The Beas river forms the eastern and southeastern boundary of the district. The area is drained into Sutlej and Beas rivers through a network of drains. Due to the higher landscape of the Tarn Taran district, there is stream bank erosion and formation of gullies/ravines along the Beas. The agricultural land is irrigated by a network of canals and shallow tubewells. The Upper Bari Doab Canal, Main branch, Kasur branch and Sobraon branch irrigate the agricultural area of the district. These canals feed 29 distributaries which further branch out as minors and sub minors making a network of canals spread over the entire district.

5. RAINFALL & CLIMATE :-

The normal annual rainfall of the district is 545 mm, which is unevenly distributed over the area in 30 days. The south-west monsoon which contributes 74%, sets in last week of June and withdraws in middle of September. July and August are the rainiest months. Rest 26% of annual rainfall occurs in the non-monsoon months in the wake of western disturbances and thunder storms.

A) Rainfall :

The southwest monsoon season is from the beginning of July to the first week of September. The succeeding period lasting till the beginning of November is the post-monsoon or transition period. Tarn Taran LPA received an annual average rainfall 389 mm in 2006 out of which 74% occurred during southwest monsoon.

B) Climate :

The climate of the LPA can be classified as tropical steppe, semi arid and hot. It is generally dry except in the south-west monsoon season, a hot summer and a cold winter. The year may be divided into four seasons. The cold season is from November to March when minimum temperature reaches 4-5°C. The period from April to June is the hot season when maximum temperature reaches 45.0°C.

C) Humidity :

Relative humidity is generally high in the mornings, exceeding 70 per cent except during the summer season when it is less than 50 per cent. The humidity is comparatively less in the afternoons. The driest part of the year is the summer season when the relative humidity in the afternoons is about 25 per cent or less.

D) Winds :

Winds are generally light with some strengthening in the summer and early part of the monsoon season. In the post-monsoon and cold season, winds are light and variable in direction in the morning and mostly from the west or north-west in the afternoons. In April and May, winds are mainly from direction between north-west and north-east in the mornings and between west and north-east in the afternoons. By June, easterlies and south –easterlies also blow and in the south-west monsoon season. winds are more commonly from directions between north-east and south-east.

6. LAND USE/LAND COVER MAPPING USING SATELLITE DATA

Six land use categories have been identified namely built-up land, agricultural land, forests, wasteland, water bodies and wetland and their description is as follows:

6.1 Built-up Land:

The total area under built-up in the district is 10483.85ha which is 4.33per cent of TGA of the district. There is 1328.71ha area under urban built-up which is 0.55 per cent of TGA of the district. Area under rural built-up is 9098.88ha (3.76% of TGA of district).

6.2 Agricultural Land:

The double cropped area in the district is 219899.23ha which is 90.91 per cent of the total geographical area of the district. Rice-wheat is the major crop rotation followed in the district. An area of 291.13 and 554.63ha in the district is under tree and fruit plantations respectively. The total area under agriculture comprising of crop land and plantations is found to be 220744.99ha which is 91.25 per cent of the TGA of the district.

6.3 Forests:

Forest cover in the district is very little; only 858.08 ha area which is only 0.35 per cent of the TGA of the district. This is negligible when compared to 33 per cent

required as per National Forest Policy. The Bhikhiwind, Naushehra Pannuan, Patti, Chohla Sahib and Valtoha blocks have no mappable area under forests.

6.4 Wastelands:

The total area under wastelands comes out to be 2932.99ha (1.21% of TGA). The wastelands include gullies/ravenous land 1334.66ha (0.55% of TGA), land with/without scrub cover 780.80ha which is 0.32% of TGA. Land under mining (Brick kilns) covered 503.40ha which is 0.21 per cent of the TGA. Salt affected land in the district is 277.86ha which is 0.11% of TGA.

6.5 Water Bodies:

The water bodies in the district occupy 4160.29ha area which is 1.72 per cent of the TGA of the district. Further, 157.82 and 504.29ha area is under canals and village ponds which is nearly 0.07 and 0.21 per cent of the total geographical area of the district. The channel area of two rivers i.e. Beas and Sutlej flowing along the southern and eastern borders of the district comes out to be 3498.18ha (1.45% of TGA of the District). Across the blocks, Chohla Sahib block has maximum area i.e. 1013.2ha under water bodies which is 3.52 per cent of its TGA.

6.6 Wetlands:

The wetlands in the district occupy 2719.80ha area which is 1.13per cent of the TGA of the district. Marshes and swamps are mainly along the Beas river in Chohla Sahib block whereas waterlogged area is found in Valtoha, Khadur Sahib and Patti blocks. Chohla Sahib block has 1904.53ha area (6.61% of TGA of block) under wetlands which is maximum among the blocks where wetlands are observed

7. AGRICULTURE :

The main Rabi crops grown in the district are- wheat (185800 hect.), gram and barley, where as kharif crops grown are- rice (166000 hect.), maize, bajra, sugar cane and cotton. Due to high degree of land utilization for production and large area brought under agriculture, at district level, 82% of the land area is dedicated to farming. The total cropped area of the district is 5,12,000 hectares and about 2,24,000 hectare area is sown more than once. Almost 86.5% of area is irrigated in comparison to gross cropped area. Hence, 7132 Ha of the total area is cultivable in the Tarn Taran LPA.

Principle Crops:

In the villages falling in Tarn Taran LPA, wheat and rice are the principal crops.

AREA WISE CROP PROD. IS AS UNDER :

SR. NO.	CROP TYPE	AREA (IN HACTARES)
1.	WHEAT	1,86,000
2.	PADDY	90,103
3	BASMATI	87,847
6	PULSES	500
8	MAIZE	700

8. **TOPOGRAPHY:**

Topographically, LPA is a continuous level plain unbroken by hills or valleys. The topographic gradient is about 0.4m/km in the LPA. It is situated at a height of 227.23 m above mean sea level. The terrain of Tarn Taran LPA is placed under three categories: The Upland Plain, Bluff along the Beas and Floodplain of Sutlej.

9. AVAILABILITY OF MINERALS:

The whole of the Tarn Taran District is composed of the recent deposits known collectively as the Indo-Genetic alluvium, which consists of the alluvial sand, clay and loam.

9.1 Alkaline Earth

Sand is the basic raw material for its utilization in any development activity through out the world. Sand is primarily produced from mining operations on the surface of the earth, near the river beds and the sand quarrying below the surface of earth. Some brick earth and foundry sands are reported from the district.

9.2 Groundwater

The entire area in the district is underlain by quaternary alluvium comprising fine to coarse sand, silt and clay, with intercalations of pebbles and kankar. Bore holes drilled down to a depth of about 100 meters have encountered 70-90 per cent of sand.. Groundwater occurs both under confined and unconfined conditions. The depth of reach water in the area ranges from about 1 to 20 meters below the land surf aces. The water-table is generally deep towards the high banks of the Beas and the Sutlej. However, in the vicinity of the canal-irrigated area and also in the floodplains of the Beas and the Sutlej, the water-table is very shallow. In many parts of the canal-irrigated areas, waterlogged conditions prevail. Land Salinization is also observed in areas affected with water logging. The groundwater available in the greater part of the district is generally fresh but hard, except in the southern part of the district where it is of inferior quality, being saline to bitter. The groundwater in general is suitable for irrigation and domestic purposes.

10. OVERVIEW OF MINING ACTIVITY :

Mainly three types of Minor Mineral constituents such as Stone, Bajri are required for any type of construction apart from other materials like cement and steel. In the earlier time, the mud houses/buildings were constructed with the use of mud . However with the passage of time, new techniques of development activities were started . As such the demand of Minor Mineral started on an increasing trend. In order to meet the requirement of raw material for construction, the extraction of sand carried out manually / semi- mechanized process from the river beds .

The local residents used to lift sand etc. from the river beds to meet out their bonafide requirement. However after coming into being the Punjab Minor Mineral rules 1964, and amended rules in 2013 . The mining is regulated in accordance with the rules. At present 01 mining quarry have been granted/executed under the above said rules in different parts of the District and 01 quarry is under process for getting the environment clearance .

10.1) LIST OF MINING QUARRIES IN THE DISTRICT :-

SR. NO.	LOCATION	AREA (IN HECTARE)	KHASRA NO.
1	Bhalojala 1	0.91	93//3,103//3/1,3/2,4/1,8
2	Bhalojala 2	1.82	51//16/1/2,1//25,51//17/1,24/2,70//4,7
3	Garka	2.05	150//6,7,14,15,16,17
4	Dhun Dhaywala	4.45	88/13,14,15,16,17,18,23,24,25,4,5
5	Booh	2.43	139//16/1,24/1,2,25//1/2,23,146//3,4/1
6	Kot Budha	4.05	92//21,22,23,24,25,100//1,2,3,4,5
7	Balarke	1.85	24//16,15,16,25,17//16,25
8	Bhojoke	4.86	20//11,12/1,19,20,18/2,19/1,21,22,23,1,3/1,33
9	Jhugian Peer Baksh	7.24	19//3,4,5,6,7,8,19//6/2,12,13,14,15,16,17,18,19//24,25
10	Ram Singh Wala	3.54	23//15,16,25/1//25/2,24//20,21,22,31//1,2,3/1,33

10.2) DETAILS OF ROYALTY OR REVENUE
RECEIVED IN LAST THREE YEARS

SR.NO	YEAR	ROYALTY(IN RS.) SAND
1	2017	12272091
2	2018	NIL
3	2019	NIL

10.3) DETAIL OF PRODUCTION OF SAND OR MINOR
MINERAL IN LAST THREE YEARS IN DISTT.

SR.NO	YEAR	SAND (IN MT)
1	2017	2500
2	2018	NIL
3	2019	NIL

11) PROCESS OF DEPOSITION OF SEDIMENTS IN THE RIVERS OF THE DISTRICT:-

The deposition in a river bed is more pronounced during rainy season although the quantum of deposition varies from stream to stream depending upon numbers of factors such as catchment, lithology, discharge, river profile and geomorphology of the river course, where annual deposition is much more even two to three meters, but it is noticed that during flood season whole of the pit so excavated is completely filled up and as such the excavated area is replenished with new harvest of minerals.

In order to calculate the mineral deposits in the stream beds, the mineral constituents have been categorized as clay, silt, sand, bajri and boulder. However during present calculation, the waste material i.e. silt which vary from 10 to 20% in different streams has also been included in the total production. **Further the Survey of India Topo-Sheets are used as base map to know the extent of river course. The mineral reserves have been calculated only upto 1.00 meter depth although there are some portions in the river beds such as channel bars, point bars and central islands where the annual deposition is raising the level of river bed thus causing shifting of the rivers towards banks resulting in to cutting of banks and at such locations, removal of this material upto the bed level is essential to control the river flow in its central part to check the bank**

cutting. While calculating the mineral potentials, the mineral deposits lying in the sub-tributaries of that particular stream/river has not been taken into consideration. Since these mineral deposits are adding annually to the main river, the mineral deposits will be much more.

There are two rivers Beas and Sutlej in Distt. Tarantaran



The District is broadly drained by river Sutlej and its distributaries from the southern boundary of the district. River Patti flows from north-east to south-west and drain water to river Sutlej. The Tarn Taran LPA forms the lower part of the Upper Bari Doab and is one of the interfluvial tracts of the Punjab Plain.

1.RIVER BEAS



This river is also called "Bipasha" and "Arijikia" Beas is another very important perennial river of the study area. It arises from Beas Kund near Rohtang Pass in Kullu district of Himachal Pradesh having height of about 4062 meters above the main sea level of southern end of Pir Panjal range of Himalaya. It flows through a deep gorge from Lorji to Talwara. It leaves Himachal Pradesh and enters Punjab near Talwara town of Hoshiarpur district. River is dammed at Talwara and this dam is known as "Pong Dam". Seasonal choes join the river Beas. The famous tributaries of Beas are Parvati, Spin, Malana, Chakki, Uhal, Pong, Sarswari, Black Bein, Kamahi Devi Khad etc. Total length of Beas from its source is 460 kms and total catchment area is 30,303 sq. kms. After flowing through plains for about 150 kms, it joins the Sutlej at Harike . At this point a headwork namely Harike has been constructed where two canals are

formed namely Rajasthan feeder (irrigates major parts in Rajasthan) and Ferozepur canal (irrigates southern parts of Punjab) . Like Sutlej and Ravi, the flow of water in this river also varies seasonally. During monsoon season it is high and during winters it is low. The Beas River becomes flooded during rainy season. The width of the flood plain is large in south (15 kms) near Harike than north (5 kms) near Dasuya. To check this flooding, a flood protection bund called Dhussi Band had been constructed in 1955-58 on the left bank of the river. The Beas touches the Tarn Taran District in the vicinity of the village of Bhalojala in Khadoor Sahib Block . It is adjoined by an abruptly rising bluff to its right throughout its course in the Amritsar and Tarn Taran . It is joined by the River Sutlej at Harike in the Patti Tehsil of District Tarn Taran.

**NAME OF VILLAGES ADJOINING BEAS RIVER WHERE SAND MAY
BE AVAILABLE IN THE DISTRICT:**

REPLENISHABLE

Sr. No.	Name of Village	Had Bast No.
1	BHALOJLA	161
2	GAGREWAL	158
3	DHUNDA	343
4	MUNDA PIND	350
5	DHUN DAI WALA JOHAL	353
6	GHARKA	352

NON - REPLENISHABLE : NIL

2.RIVER SUTLEJ



The ancient name of Sutlej is “Shatudri”. It rises near the Darma Pass near Mansarovar Lake in the Tibet at the height of 4570 meters. It enters the Zaskar range near Shipki la pass and flows through Tibet before entering India. It acts through the great Himalayan range and the outer Himalayas and after a long Journey it enters Punjab near Nangal Town of Roop Nagar distt. The river has been dammed at Bhakra village 14 kilometers above Nangal in Himachal Pradesh. In Punjab plains, seasonal tributaries like Sirsa, the Siswan Budha Nala and White Bein join it. In Punjab at Harike, river Beas Joins river Sutlej, the total length of the river is 1050 kms. in Indian Territory. The flow of water in it varies seasonally. During monsoon, the flow of water is high due to rains and with the melting of snow in mountains during summer. While decline in water flow starts with the offset of monsoon in late September. In the month of January minimum flow of

water is noted. The width of its flood plains ranges between 5-12 kms. It forms the boundary between India and Pakistan for nearly 120 Kilometers. It finally enters Pakistan near Suleimanki near Fazilika District of Punjab.

NAME OF VILLAGES ADJOINING SUTLEJ WHERE SAND MAY BE AVAILABLE IN THE DISTRICT:

REPLENISHABLE

Sr. No.	Name of Village	Had Bast No.
1	SABHRAH	190
2	KOT BUDHA	341
3	JALOKE	344
4	RAM SINGH WALA	329
5	MUTHIANWALA	321

NON – REPLENISHABLE

1	BOOH	188
2	KUTTIWALA	353
3	KOT BUDHA	341
4	MAHANEKE JAND	197
5	TOOT	334
6	BHANGALA	331
7	BAHADUR NAGAR	198
8	GAZAL	199

DRAINAGE SYSTEM WITH DESCRIPTION OF MAIN RIVERS

SR.NO	NAME OF THE RIVER	AREA DRAINED (Sq.Km)	% AREA DRAINED IN THE DISTRICT
1	BEAS	1200	46 %
2	SUTLEJ	750	29 %

SALIENT FEATURES OF IMPORTANT RIVERS AND STREAMS.

S. No	Name of the River or Stream	Total Length in the District (in Km.)	Place of origin	Altitude at origin
1	BEAS	48	Beas Kund	305 to 381
2	SUTLEJ	30	Himachal Pardesh	

FOR RIVER BEAS

Portion of the River or Stream Recommended for Mineral Concession (in Km.)	Length of area recommended for mineral concession (in kilometer)	Average width Of Area recommended For Mineral concession (in meters)	Area recommended for mineral concession (in square km meter)	Mineable mineral potential (in metric tonne) (60% of total mineral potential)
48	18	400	7.2	18792000

MINERAL POTENTIAL

Boulder (MT)	RIVER BED BAJRI (MT))	SAND(MT)	Total Mineable Mineral Potential (MT)
NIL	NIL	18792000	18792000

FOR RIVER SUTLEJ

Portion of the River or Stream Recommended for Mineral Concession (in Km.)	Length of area recommended for mineral concession (in kilometer)	Average width Of Area recommended For Mineral concession (in meters)	Area recommended for mineral concession (in square km meter)	Mineable mineral potential (in metric tonne) (60% of total mineral potential)
30	11	400	4.4	11484000

MINERAL POTENTIAL

Boulder (MT)	RIVER BED BAJRI (MT))	SAND(MT)	Total Mineable Mineral Potential (MT)
NIL	NIL	11484000	11484000

TOTAL MINERAL POTENTIAL FOR THE DISTRICT :

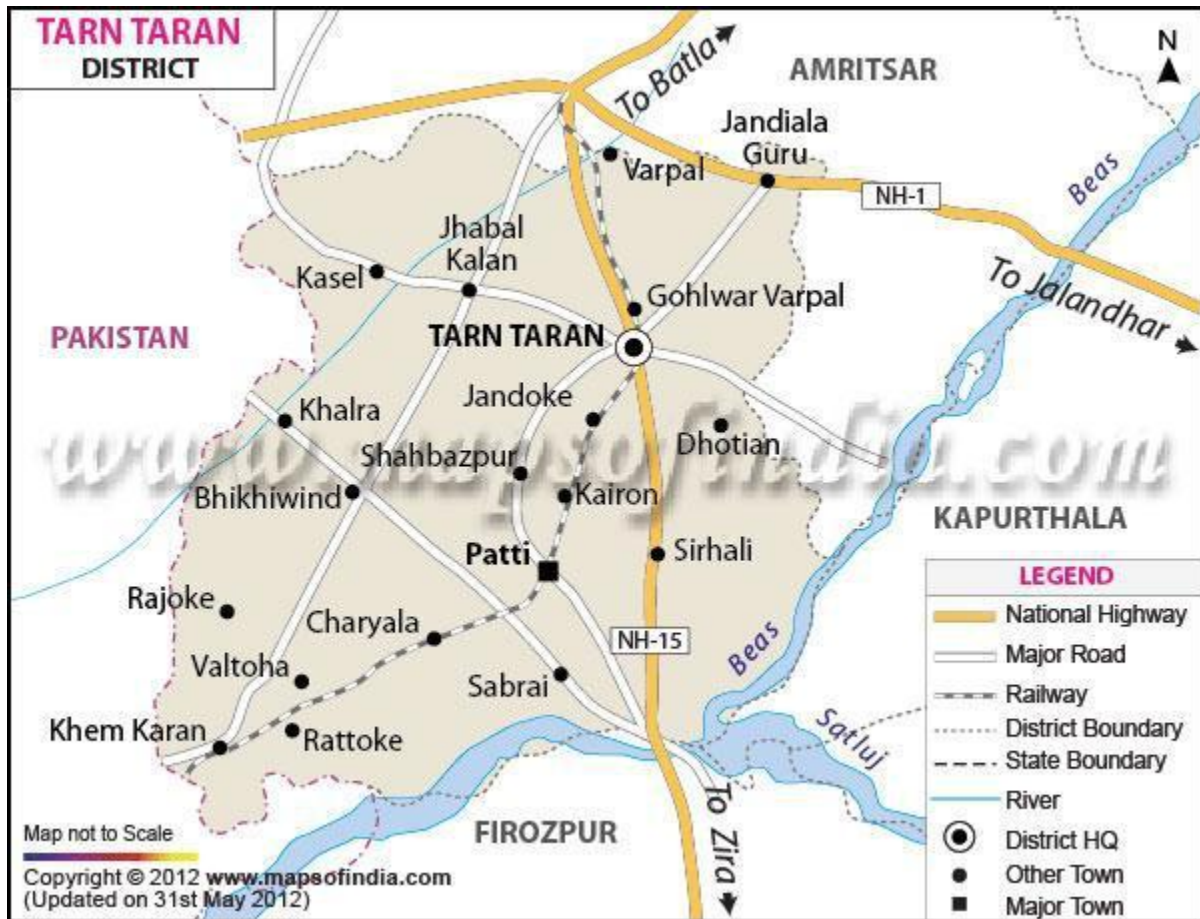
a) MINERAL POTENTIAL FOR REPLENISHABLE AREA :

Sr. No.	Name of River	Portion of the River or Stream Recommended for Mineral Concession (in kilometer)	Length of area recommended for mineral concession (in kilometer)	Average width of area recommended for mineral concession (in meters)	recommended for mineral concession (in square meter)	Mineable mineral potential (in metric tonne) (60% of total mineral potential)
1.	BEAS	48	18	400	7.2	18792000
2.	SUTLEJ	30	11	400	4.4	11484000
	TOTAL	78	29	700	407	30276000

b) MINERAL POTENTIAL FOR NON- REPLENISHABLE AREA :

Quantity for non- replenishable area could not be ascertained due to non-willingness of land owners for excavation of minor minerals from their own lands . However, it is recommended that on receipt of request of land owner , a Sub Divisional Level Committee may visit the site quarry to ascertain the viability of mineral potential i.e. area and mineral quantity for recommending the case to the concerned authority for approval.

ANNUAL DEPOSITION SHOWING BEAS / SUTLEJ RIVER CATCHMENT IN DISTT. TARNTARAN



The sudden increase in hydraulic radius, the carrying capacity of the river decreases as a result of which all the load carrying by the river is deposited.

This stream has developed a high flood plain near the confluence of rivers as during flood season, the velocity of this stream is checked by the water of rivers and most of sand sediments load is deposited near the confluence point.

The annual replenishment in the river depends upon the velocity of the river. Annual replenishment depends upon the period of rainy season and

rainfall at different places of the flow of River. To calculate the replenishment data at this stage is very difficult. It is suggested that before considering the report for environment clearance Joint Inspection Team's report must be collected as per Punjab Minor Mineral rules 2013 because the regular demand of sand stone and bajri for the development activities in this respective areas. Before approval of the quarries, it is suggested that joint inspection committee report may be demanded as per Punjab Minor Mineral rules 2013 to determine actual quantity of sand available in the quarry of that particular area.

GENERAL RECOMMENDATIONS/CONCLUSIONS:

During the preparation of the present report prominent rivers/ streams has been studied in detail, as the rest of the streams/rivers either have very insignificant annual replenishment/ approachability problem or are very narrow at most of the places and as such are not fit for grant of mineral concession for mineral based industries, however it is also important to mention here that because of the regular demand of sand, stone and bajri for the developmental activities in the respective areas, such streams are prone to illegal mining, It is suggested that the auctions of quarries be done regularly to meet out the local demand subject to the approval from the joint Inspection Committee as per Punjab Minor Mineral Rules 2013 .These mineral concessions shall also reduce demand load and will be helpful to minimize illegal extraction of minerals, failure of which may result in to illegal mining at odd hours and shall be haphazard and more detrimental to the local ecology. Irrespective of it following geo-scientific considerations are also suggested to be taken into account during the river bed mining in a particular area:

1. Abandoned stream channels or terrace and inactive floodplains may be preferred rather than active channels and their deltas and floodplains.
2. Stream should not be diverted to form inactive channel.

3. Mining below subterranean water level should be avoided as a safeguard against environmental contamination and over exploitation of resources.
4. Large rivers and streams whose periodic sediment replenishment capacities are larger, may be preferred than smaller rivers.
5. Segments of braided river system should be used preferably falling within the lateral migration area of the river regime that enhances the feasibility of sediment replenishment.
6. Mining at the concave side of the river channel should be avoided to prevent bank erosion. Similarly meandering segment of a river should be selected for mining in such a way as to avoid natural eroding banks and to promote mining on naturally building (aggrading) meander components.
7. Continued riverbed material mining in a given segment of the river will induce seasonal scouring and intensify the erosion activity within the channel. This will have an adverse effect not only within the mining area but also both in upstream and downstream of the river course. Hazardous effects of such scouring and enhanced erosion due to riverbed mining should be evaluated periodically and avoided for sustainable mining activities.

8. Mining area should be demarcated on the ground with Pucca pillars so as to avoid illegal unscientific mining.
9. It is recommended that Sub Divisional Level Committee may take into consideration all its relevant aspects / data while scrutinizing and recommending the application for EC to the concerned Authority.