REPLENISHMENT STUDY REPORT FOR

RIVER BED MINING PROJECT OF MINOR MINERAL

ORDINARY SAND (BAJRI)

AT
RIVERS, NALLAS, GAIR MUMKIN NADI IN
TEHSIL – GANGDHAR,
DISTRICT – JHALAWAR, STATE – RAJASTHAN
NAME OF RIVER – CHAMBAL , SIPRA, CHOTI KALI SINDH, CHACBARAM RIVER & THEIR CONNECTED FLOW NALLAHS
Proposed production – 7,50,000 TPA
LEASE AREA – 1179.84 Hect.
CATEGORY- 'A'
EC letter No. – J-11015/327/2013-IA.II (M) dt. 26/02/2016
Replenishment Study Period –
Pre – monsoon and Post – monsoon season of year 2017

APPLICANT

INDRAJEET SINGH JHALA
NALA MOHALLA, KHARI KUIYA,
P.O. JHALAWAR, TEHSIL – JHALRAPATAN
DIST. – JHALAWAR (RAJ.)
Mob. +91 9414193514 (M)
E mail:- indrajeetsinghjhala@gmail.com

PREPARED BY

M/S UDAIPUR MIN-TECH PVT. LTD.
206-APEKSHA COMPLEX, SECTOR NO.-11,
HIRAN MAGARI, UDAIPUR-313002 (RAJ.).
PH- 91-294-2489672 (OFF.)
Mob. 9414167672
E mail :- ssbist@udrmintech.com

ACCREDITED BY NABET (S.NO. 144) CATEGORY "A" FOR SECTOR 1

CONTENTS

Introduction:

The proposed project is for River Bed mining of ordinary sand (Bajri) from River Chambal, Sipra, Choti Kali Sindh, Chacbaram River & their connected flow nallahs. The applied lease area is situated in Tehsil – Gangdhar of District – Jhalawar State – Rajasthan.

Applicant: Mr. Indrajeet Singh Jhala,

Nala Mohalla, Khari Kuiya,

P.O. Jhalawar, Tehsil – Jhalarapatan,

District – Jhalawar, (Rajasthan)

Mob. +91 9414193514

Mining of Ordinary Sand (Bajri) is proposed in the river bed, the lease area is 1179.84 ha (Govt. Land). Proposed production is 7, 50,000 Tons per annum of Sand.

The letter of intent was issued by Joint Secretary, Mines (Group-2), Government of Rajasthan, letter no. P.9 (2) Khan/Group-2/2013, Jaipur dated 08.03.2013.

The Letter of Intent was recommended to be issued by Supdt. Mining Engineer (M III) vide his letter no. Dir/P2 (A8) Jhala/Bajri/2012/274 Dt. 18.01.2013, As per RMMCR' 1986, validity period of lease is five years.

The mining plan was approved by Suptdg. Mining Engineer, Kota vide letter no. SME/Kota/CC-II/MP/13/11748 dated 13.12.2013.

G.T. Sheet No. – 45 P/8, 12 & 46 M/9, 15.

Type of Land	Area in Ha.
Nadi, Nalla, River, Govt. waste land	**1179.84**

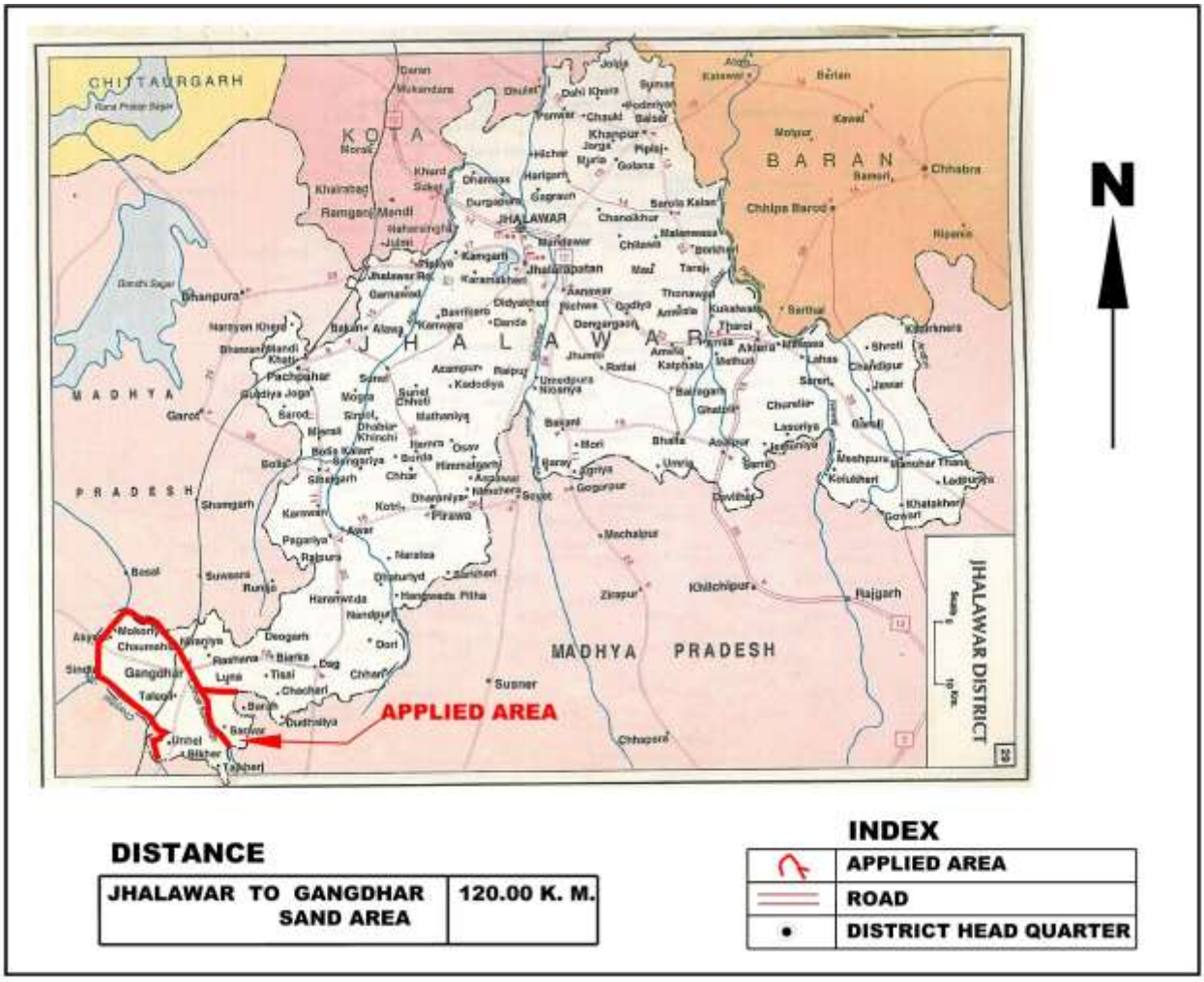
PROJECT DETAIL

S. No.	Particulars	Details
1	Locations	
2	Near Village	Parapipli, Mundla, Bishniya, Chaumahla, Gangdhar, Malharganj, Pipakheri, Uncha bardlya, Lakha kheri parmar, Chiri, Sarwar, Magal, Unhel, Kishangarh, Karmakheri, Chara, Tonkra.
3	Tehsil	Gangdhar
4	District	Jhalawar
5	State	Rajasthan
6	Latitude	24º 01′ 32.47′′ - 23º 47′ 32.21′′ N
7	Longitude	75º 42′ 02.82′′ - 75º 27′ 37.45′′ E
8	Elevation above sea level	436 mRL to 390 mRL
9	Nearest National Highway	SH-14, passing from Gangdhar Tehsil.
10	Nearest Railway station & Airport	Railway Station – Chaumahla at a distance of 3 km from Gangdhar. Airport – Indore (188 Km.)
11	Nearest Tourist Place	Jhalawar – 120 km, from Gangdhar.
12	Archeological Place	No Archeological place in the study area.
13	National Park , Wild Life Sanctuary, Wild Life Corridors, Biosphere Reserves, Migratory routes for Birds, Reserved/Protected Forest	• Game Sanctuary – 6.5 Km, from Jhalawar in N direction. • Near Bagher (P.F.), between Latitude $24^0$35’ to $24^0$40’ and Longitude $76^0$15’ to $76^0$20’ • Near Kishanpura (R.F.), between Latitude $24^0$25’ to $24^0$30’ and Longitude $76^0$10’ to $76^0$15’. • Bakani (R.F.), between Latitude $24^0$25’ to $24^0$30’ and Longitude $76^0$15’ to $76^0$20’.
14	Nearest major city	Gangdhar
15	Nearest Water bodies	Applied Lease area itself is a water body
16	Nearest town	Gangdhar. District H.Q. – Jhalawar.

LENGTH AND WIDTH OF THE LEASE AREA.

Name of River	Length (mtr.)	Width (mtr)
Chambal & its connected flow nalla	13597.0	108.0
Sipra & its connected flow nallah	21286.0	96.0
Choti Kali Sindh & its connected nallah	34153.0	142.0
Chacbaram & its connected nallah	10273.0	43.0

LOCATION MAP



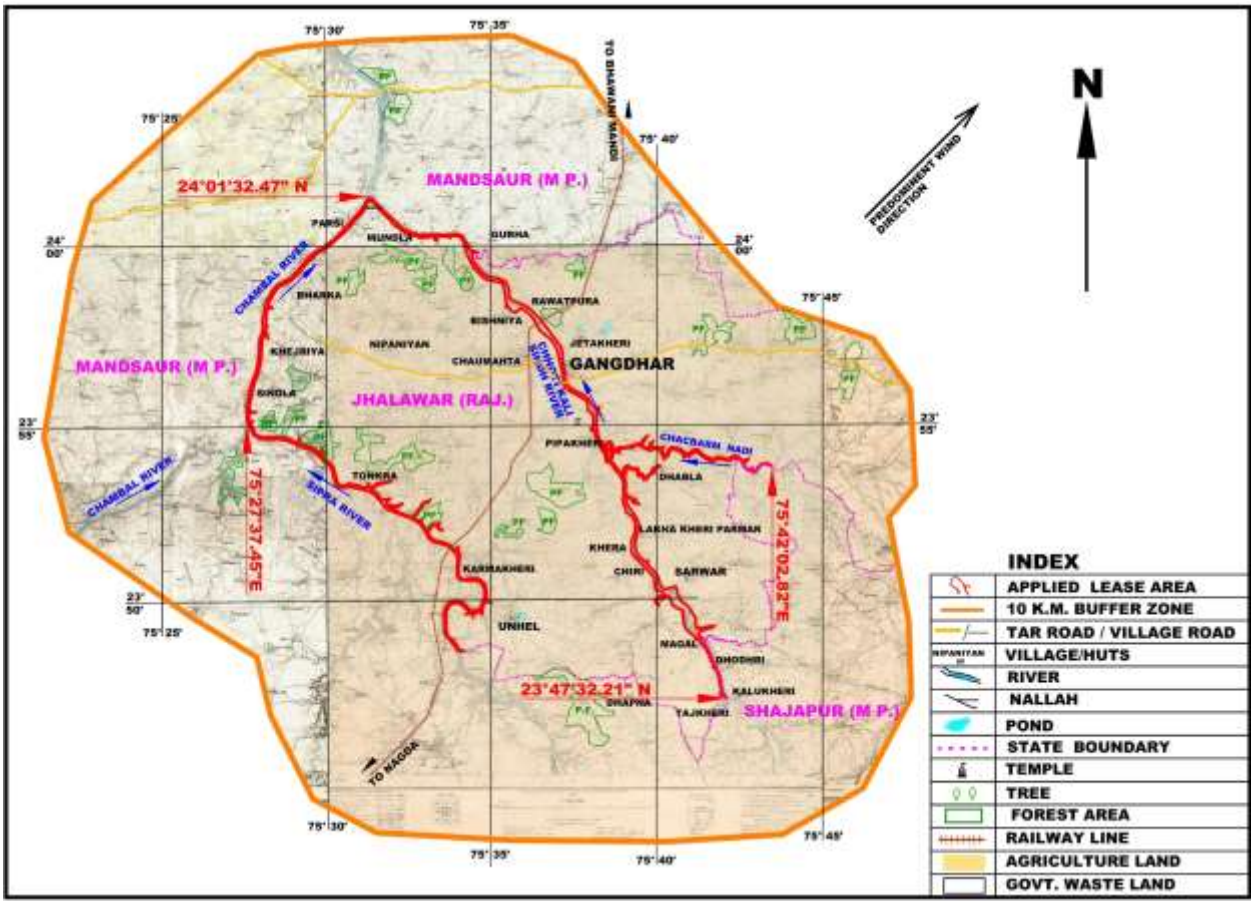
DISTANCE

JHALAWAR TO GANGDHAR SAND AREA	120.00 K. M.

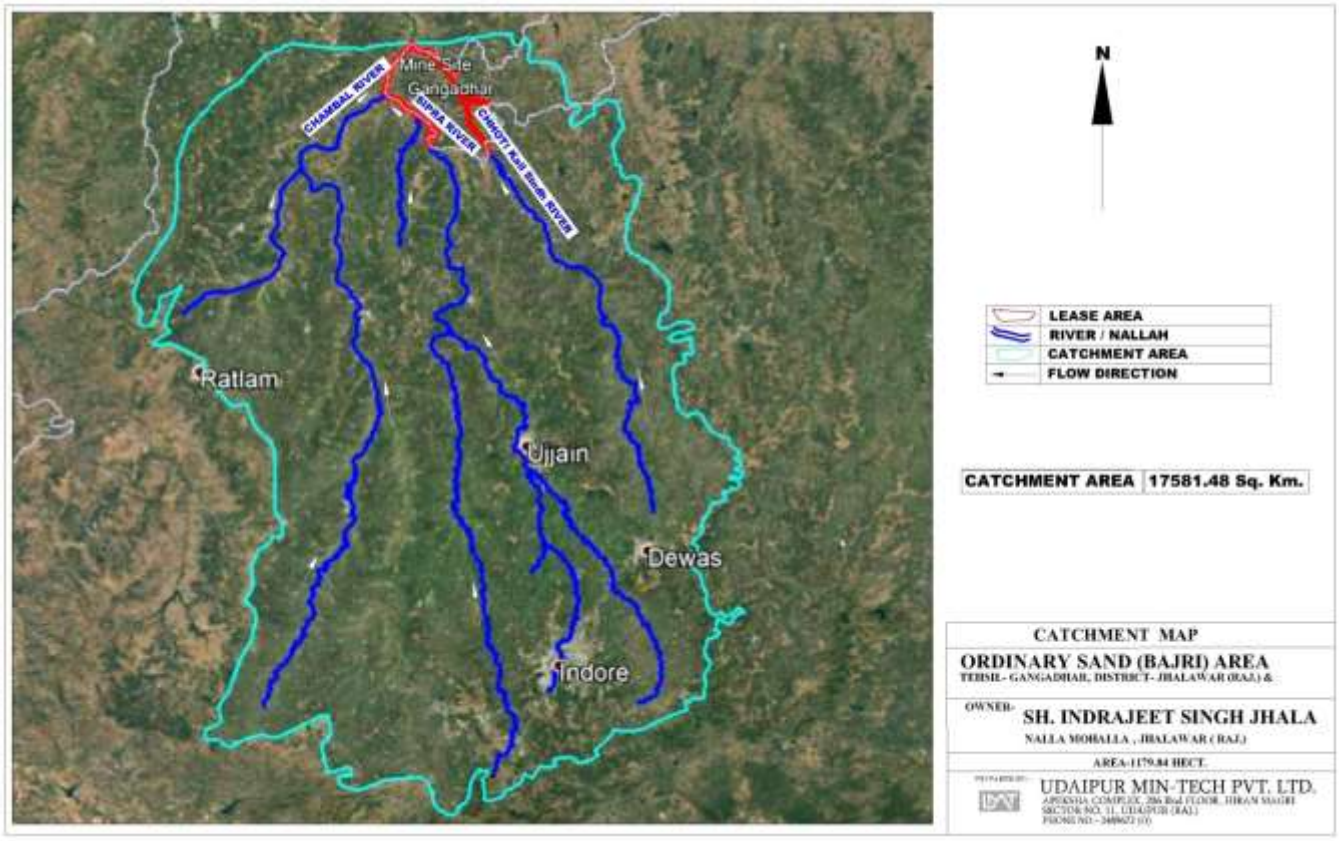
INDEX

	APPLIED AREA
	ROAD
•	DISTRICT HEAD QUARTER

KEY PLAN


N
PREDOMINENT WIND DIRECTION
24°01'32.47" N
MANDSAUR (M P.)
MANDSAUR (M P.)
JHALAWAR (RAJ.)
GANGDHAR
SHAJAPUR (M P.)
23°47'32.21" N
75°27'37.45"E
75°42'02.82"E
CHAMBAL RIVER
SIPRA RIVER
CHACHAIN NADI
TO BHAWANI MANDI
TO NAGDA
PARSI
MUNSLA
GURHA
BHARKA
RAWATPURA
BISHNIYA
NIPANIYAN
JETAKHERI
CHAUHANTA
KHEJRIYA
SIKOLA
PIPAKHERI
DHABLA
TONKRA
KARMAKHERI
UNHEL
KHERA
CHIRI
SARWAR
NAGAL
DHODHRI
KALUKHERI
TAJKHERI
DHAPNA
INDEX
APPLIED LEASE AREA
10 K.M. BUFFER ZONE
TAR ROAD / VILLAGE ROAD
VILLAGE/HUTS
RIVER
NALLAH
POND
STATE BOUNDARY
TEMPLE
TREE
FOREST AREA
RAILWAY LINE
AGRICULTURE LAND
GOVT. WASTE LAND

Catchment Area Map



PHOTOGRAPHS OF LEASE AREA

Stages of Environmental Clearance

Application for prior Environmental clearance for the above project was submitted to the Ministry of Environment and Forest (MoEF) on 23.08.2013 for determination of Terms of Reference (ToR) for the preparation of EIA Report.

Proposal for ToR was considered in 16th meeting of EAC held during 31st Oct. – 01st Nov. 2013 and TOR letter was issued by MoEF & CC, New Delhi vide letter No. J-11015/327/2013-IA.II (M) dated 22.11.2013, for preparation of EIA/EMP report.

In accordance with ToR letter Baseline Study was carried out during Dec. 2013 to Feb. 2014 and draft EIA/EMP report submitted to State pollution control Board for conducting Public Hearing.

Public Hearing was conducted on 10.06.2014, at Tehsil Headquarter Gangdhar, District Jhalawar, Rajasthan, for the purpose of grant of Environmental Clearance (EC) to the River Sand Mining Project, for a production capacity of 7,50,000 tonnes per annum of Sand.

The final EIA/EMP Report was submitted online to Ministry for seeking environment clearance on 30th Oct., 2014.

The proposal for EC was appraised by EAC in its 27th meeting held during Dec. 10-11, 2014.

Environmental Clearance was granted by MoEF & CC, New Delhi vide letter no. J-11015/327/2013-IA.II (M) dt. 26/02/2016.

After that in compliance of Environmental Clearance replenishment study was done for pre-monsoon & post monsoon season of year 2017.

Replenishment Study:

Topography, Drainage pattern, General Geology & Local geology

The topography of the applied area is mainly part of river with shallow depth and undulations. The highest elevation of the applied lease area is 436 mRL and lowest being 390 mRL. The drainage pattern of this area in general flowing from south to north direction.

Drainage:

Drainage pattern of the area is dendritic. The applied lease area part of the River Chambal, Sipra, Choti Kali Sindh, Chacbaram River & their connected flow nallah.

In the lease area, the tributaries namely Choti Kali Sindh River in the East and Sipra River in the West unite near Parapilli to flow towards North as Chambal River main. The rivers show moderate meandering at few places, elsewhere the drainage is simple and without bifurcations.

General Geology & Local Geology

General Geology:-

Jhalawar district comprises of rocks of Vindhayan super group and Deccan traps. About 60 % of the district is covered by Deccan trap flows. The Deccan traps underlie the Vindhayan Super group.

The pretrappean rock formations comprise Lower and Upper Vindhyans represented by Jhalarapatan sandstone, Suket Shales and limestone, Kaimur sandstone, Rewa shale, sandstone and conglomerates, Ganurgarh shales, Lower Bhander sandstone and limestone, Sirbhu shales and limestone.

The Vindhayan sandstone and shales form linear hills trending northwest to southeast and velleys. They are exposed around Jhalawar and to its north east and north west. These rocks have been overlain by twelve basaltic flows between 280 mts. to 481 mts. R. L., around Dag and Chaumahala areas, the flows have undergone widespread lateritisation. Both fossiliferous and imfossiliferous intertrappean clay, chert limestone beds are also present.

The general stratigraphic succession of the district is as under:

Recent	Quaternary Alluvium		River borne alluvium and soil
Upper Vindhayan	Deccan Trap Formation		Twelve Basaltic flows (7 to 45 meters) with intertrappean beds.
		Sirbhu Shales	Shales with siltstone with limestone intercalations.
	Bhander Group	Lower Bhander Sandstone	Sandstone with shale intercalations.
		Bhander Limestone	Impure argillaceous stromatolitic limestone intercalations.
		Ganurgarh Shale	Variegated shale
	Rewa Group	Rewa Sandstone	Sandstone, conglomerate and grit with shale.
	Rewa Shale	Rewa Shale	Brown, purple and green shales.
Lower Vindhayan	Kaimur Group	Kaimur sandstone	Sandstone, grit and conglomerate
		Suket Shale	
	Semri Group	Suket Limestone	Khaki brown and purple coloured shales Limestone
		Jhalarapatan Sandstone	Sandstone with intercalated shales.

Drainage density in most part of the district varies from 0.5 to 0.7 km/km2. Drainage density is from 0.7 to more than 1km/km2 in south eastern and south western part of the district. In the north central part of the district its low and ranges between 0.3 to 0.5 km/km2. The Chambal River remains perennial throughout the year, whereas tributaries like Choti Kali Sindh, Sipra River are seasonal and shoaly in nature.

Local Geology:

In the applied lease area, the tributaries namely Choti Kali Sindh River in the East and Sipra River in the West unite near Parapilli to flow towards North as Chambal River main. The rivers show moderate meandering at few places, elsewhere the drainage is simple and without bifurcations.

In the lease area most of part is covered with sand. In the applied lease area vicinity of rocks type consists of sandstones, limestone, shale's of Vindhayan group as well as Deccan traps.

The sand deposit in the applied lease area is brought in form from the up-river basin in where rock types like sandstones, which contribute as a source to sand in the river.

The lease area is having gentle slope towards south to north, during the survey and mapping of the applied lease area, gradient of the Chambal, Sipra, Choti kali Sindh & Chacbaram River found is 1:1231, 1:1100, 1:1226 & 1:1333 respectively.

Summary of Reserves as per Approved Mining Plan:

A) <u>Geological Assessment / Study:</u>

Resource Quality and Quantity Assessment:

(a) Resources quality assessment:

Bajri will be mined from the river bed to be used as building material.

(b) Resources quantity assessment:

Geological Resources have been estimated as per UNFC guideline.

Summary of resources available in the applied area as below:

Four rivers are situated in this applied area. The dimensions and grid position at the Plan is given below. Their junction is at Chambal River at Para Pipli village. The names of rivers and dimensions are given in the table below:

Name of River	Length m	Width m	Thickness m	Mineral	Remarks
1.Chambal and its connected nallah	13597	108	3.0	Sand (Bajri)	0.0 S to 12000 S and 0.0 W to 6000 W
2.Sipra and its connected flow nallah	21286	96	3.0	Sand (Bajri	12000 S to 24000 S and 6000 E to 6000 W.
3.Choti Kali Sindh and its connected nallah	34153	142	3.0	Sand (Bajri	0.0 S to 22700 S and 0.0 E to 17000 E
4.Chacbaram and its connected nallah	10273	43	3.0	Sand (Bajri	12000 S to 14000 S and 12000 E to 20000 E.

Sand Reserves Calculation

Measured Category – 331 **Bulk density 1.6**

Name of River	Length m	Width m	Thickness m	Volume Cu m	M.T.= (Volume* Bulk density)
1.Chambal and its connected nallah	8292	108	3.0	2686608	4298572.8
2.Sipra and its connected flow nallah	19286	96	3.0	5554368	8886988.8
3.Choti Kali Sindh and its connected nallah	24503	142	3.0	10438278	16701244.9
4.Chacbaram and its connected nallah	9870	43	3.0	1273230	2037168.0
			Total	**19952484**	**31923974.4**

Measured Reserves	(331)	31923974 MT
Losses along Statutory Barrier zone	(211)	1486824 MT
Losses due to Railway line	(211)	656640 MT
Losses due to Public Road	(211)	1482240 MT
	TOTAL	3625704 MT
Remaining Reserves	**(111)**	**28298270.4 MT**

Mineable Reserves & Life of Mine;

Recovery:

Recovery of Sand from the ROM is estimated at 100 % of the reserves. Life of mine is calculated based on reserves under UNFC code 111 & 211 only. Life is estimated at the 750000 tonnes of production of ROM per year.

Reserves as per UNFC	Code	In-situ In tones	Recoverable	Sub Grade	Rejects
Proved	111+211	31923974	100%	Nil	Nil

Life of mine is estimated at 28298270 tones/ 750000 per annum = 37.73 years

Method of mining:

The method of mining is manual; a loading gang of 4 persons are deputed to load Bajri with the help of spade and iron pan to the tractor trolley and transported from working site to the different destinations.

Sometimes extra loads which are not booked by the buyers are unloaded at the Stack yard made for temporary storage.

It is proposed that a JCB model 3D loader cum excavator, tyre mounted shall be used for loading in the Stack yard only. The loading will take place in a Truck / Dumper & Tractor Trolley. This will ensure supply to the consumer or buyer directly from the working sites.

The proposed working will be done in five blocks in different sites of the applied lease area. The total applied lease area is 1179.84 hect. and about 130.0 hect. area will be excavated in different five blocks in the operational phase.

Production Detail & Replenishment:

LOI was issued to PP on 08.03.2013 & EC was granted by MoEF & CC, New Delhi vide letter no. J-11015/327/2013-IA.II (M) dt. 26/02/2016 for production of 7,50,000 TPA . As per supreme court order dated 25.11.2013 in civil appeal no.(s)9703-9706 of 2013 between Chief Secretary, Govt. of Rajasthan versus National Green Tribunal Bar Association & ORS of SLP @ no. 34811 of 2013, the production was started in Dec. 2013.

As per the approved mining plan, Dt. 13/12/2013 available reserves were **28298270.4 tonnes.**

Production carried out:

S. No.	Date, Month & Year	Production in tons
1.	24th Dec. 2013 to 31st March 2014	64617
2.	1st April 2014 to 31st March 2015	209552
3.	1st April 2015 to 31st March 2016	236103
4.	1st April 2016 to 31st March 2017	361561
5.	1st April 2017 to 30th Nov. 2017	123670
	Total	995503

***Authenticated production detail is enclosed.**

In the approved mining plan production was proposed in 5 mining blocks and highest production achieved is 3,61,561 tonnes during the period 1st April 2015 to 31st March 2016.

Replenishment study was carried out for the pre-monsoon and post-monsoon season of 2017 in the mining blocks where mining was done.

REPLENISHMENT OF THE AREA

The rate of gross or absolute silt production (erosion) in the watershed and the ability of the stream system to transport the eroded material in a river and then to a reservoir has the direct relation with the quantity of sediment delivered into a reservoir. The rate of gross erosion is dependent upon many physical factors live climatic conditions, nature of soil, slope of the area, topography and the land use. Hydro-physical conditions of the watershed govern the capability of transporting the eroded material. It has been observed that the average rate of sediment production decreases as the size of drainage area increase and the larger watershed the lesser is the variation between the rates. The larger watershed presents more opportunity for deposition of silt during its traverse from the point of production. The watershed with maximum land use class of forest generate very low rate of production unless the forest are degraded or open forest. The cultivated watersheds with unscientific farming produce very high rate of silt production. The total amount of eroded material, which reaches a particular hydraulic control point, is termed as sediment yield. The sediment control of inflow is governed by Character of run-off; Susceptibility of soils; the extent and density of vegetative cover in the area; and the hydraulic efficiency of the drainage system.

The rotational mining is being adopted to facilitate the replenishment of the excavated pits during rainy season. Thus the mineable area has been divided in five blocks i.e. the upstream block and the downstream block. The Mining of these blocks is suggested on rotation basis in such a way that pit of previous year mining will act as depository for the monsoon season. Sand is extracted from the said lot during one year; more than the extracted quantity of the same are automatically replenished by rainfall in the monsoon by the river/ nallah itself on account of its flow and velocity.

Source of sand in proposed River bed area:-

The Chambal River, called Charmanvati in ancient times, is the largest of the rivers flowing through and Rajasthan State. This is a major tributary of Yamuna which is 960 km long. Located in Central India, the river comprises a significant portion of the Greater Gangetic Drainage System. The Chambal River runs according to a north to northeasterly itinerary

through Madhya Pradesh, flowing for a considerable distance through Rajasthan, subsequently creates the border between Madhya Pradesh and Rajasthan prior to twisting to the southeast to meet the Yamuna in the state of Uttar Pradesh. The total area drained by the Chambal up to its confluence with the Yamuna is 143,219 sq. km out of which 76,854 sq. km lies in Madhya Pradesh state, 65,264 sq. km in Rajasthan state and 1,101 sq. km in Uttar Pradesh. The Chambal basin lies between the longitudes 73°20' E and 79°15' E and latitudes 22°27' N and 27°20' N.

The length of Chambal River is 960 km. The river has its source near the Singar Chouri crest in the northern sides of the Vindhyan cliffs, 15 km west to southwest of Mhow in Indore District, Madhya Pradesh. The origin of the Chambal River lies at a height of around 843 m. It runs initially according to a northward itinerary in Madhya Pradesh for a distance of around 346 km and subsequently in a typically northeastward course for a span of 225 km across Rajasthan. The river runs for a further 217 km amid Madhya Pradesh and Rajasthan and an extra 145 km amid Madhya Pradesh and Uttar Pradesh. The Chambal River moves into Uttar Pradesh and runs for around 32 km prior to meeting the Yamuna River in Etawah district of Uttar Pradesh at an altitude of 122 m, for creating a portion of the greater Gangetic drainage system.

The river is a rainfed river and the overall drainage basin till its meeting point with the Yamuna covers an area of 143, 219 km2. The shape of the catchment basin of the river is like a rectangle till the intersection of the Banas and Parvathi Rivers with the Chambal running beside its main axis. The river valley is situated amid latitudes 22° 27' North and 27° 20' North and longitudes 73° 20' East and 79° 15' East. To its east, west, and south, the valley is surrounded by the mountain ranges of Vindhya and by the Aravallis to the northwest. Under the meeting point of the Banas and Parvathi, the drainage basin gets thinner and extended. In this span, it is bordered by the Vindhyan mountain range to the south and the Aravalli mountain ranges to the north.

Origin & Catchment area:

The Chambal River originates in Kota, Rajasthan and merges with the Yamuna at Bhareh. The river passes through sandy ravines which are famous for its dreaded dacoits

The Chambal River is a 650-mile river flowing from the Vindhya Mountains of north central India eastward into the Jumna River. The Jumna in turn originates in the Himalayas and empties into the Ganges River. The Chambal is one of the few places remaining in India with enough unpolluted water that it can support Ganges River Dolphins.

Chambal River Basin is located in eastern Rajasthan, Banas and Mahi Basins lie to its west, and Gambhir and Parbati Basins to its north. Its eastern and southern edges border Madhya Pradesh State. Chambal River Basin extends over parts of Chittorgarh, Bhilwara, Bundi, Sawai Madhopur, Tonk, Jhalawar, Kota, Baran and Dholpur Districts. The total catchment area of the Basin is 31,460 km2. The western part of the Basin is marked by hilly terrain belonging to the Vindhyan chain, with fairly sloping terrain along the Chambal River and its tributaries.

The mean annual rainfall over the Chambal Basin was computed as 797 mm, of which about 93% falls during the four Monsoon months (June-September).

The Shipra, also known as the Kshipra, is a river in Madhya Pradesh state of central India. The river rises in the North of Dhar district, and flows north across the Malwa Plateau to join the Chambal River at the MP-Rajasthan boundary in Mandsaur district.

Average annual rainfall of the district is 883.0 mm.

Method of Replenishment Study:

For the said project replenishment study has been done during the pre-monsoon (May-2017) and post-monsoon season (Oct. - 2017) of 2017- 18 by field survey (volumetric survey) method.

Firstly Volumetric Survey was done in the proposed mining blocks in pre monsoon season from where mining was done. By this method spot RL/level was marked & mapped and sections were drawn.

Photographs of volumetric survey - Pre monsoon Season

Plan and Sections of the area - Pre monsoon Season

After that for post-monsoon season again spot RL/level was marked & mapped on the same location and sections were drawn.

Photographs of volumetric survey - Post monsoon Season

Plan and Sections of the area - Post monsoon Season

Result:

Both the sections (pre-monsoon and post-monsoon) are superimposed and volume has been calculated & given in below table.

River Block volume calculation

Sr. No.	Area of Mining Block (in Sq. mtr)	Thickness of area Pre monsoon season	Thickness of area Post monsoon season	Volume in cu.m	In tonnes (vol. X bulk density, 1.6)
1	323055 sq.m, Block-A Sipra River	0.00 m.	0.30 m.	96916.5 cu.m	155066.4 t
2	298511 sq.m, Block–B Sipra River	0.00 m.	0.28 m.	83583.08 cu.m	133732.93 t
3	351588 sq.m, Block–A Chhoti Kali Sindh River	0.00 m.	0.25 m.	87897.0 cu.m	140635.2 t
4	241706 sq.m, Block–B Chhoti Kali Sindh River	0.00 m.	0.35 m.	84597.1 cu.m	135355.36 t
5	136239 sq.m, Block-A Chacbarm River	0.00 m.	0.39 m.	53133.21 cu.m	85013.14 t
Total				406126.89 cu.m	649803.03 t

Conclusion:

The replenishment of Sand/Bajri has been calculated by volumetric survey method and amount of sand deposited in the post monsoon season was calculated.

In the previous year's mining was done and highest production achieved is 3,61,561 tonnes in the year 2015 – 16 against which, total 649803.03 tonnes sand has deposited in post monsoon season of 2017.

Sr. No.	Lease Area	Estimated Reserves (as per approved mining plan)	Annual Production capacity	Estimated Annual replenishment	Replenishment Status vis-à-vis planned production
1.	1179.84 ha.	28298270.4 tonnes	7,50,000 tonnes	649803.03 tonnes	Replenishment less than planned annual production

*Amount of sand deposited is 6,49,803.03 tonnes & proposed production is 7,50,000 tonnes i.e. appox. 86.64% replenishment has been done.

In the applied lease area replenishment depends upon the rainfall, if adequate amount of sand will not replenish during monsoon then excavation of sand will be limited to the quantity which will be equivalent to the replenished material up to a depth of 3 mtrs. only.

=====******=====**