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**DISTRICT SURVEY REPORT (DSR) OF
KALAHANDI DISTRICT, ODISHA
ON SAND MINING / RIVER BED MINING**

As per Notification No. S.O. 141(E), 15th January, 2016 & S.O. 3611(E),
25th July, 2018, New Delhi, MINISTRY OF ENVIRONMENT, FOREST &
CLIMATE CHANGE (MoEF & CC)



**COLLECTORATE OF KALAHANDI, ODISHA
SEPTEMBER-2019**

Delhi

[Signature]
24/10/2019

Collector Kalahandi

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In addition to the above points, the report contains the following:

- (a) District wise details of river or stream and other sand source; **Annexure-I**
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Additional District Magistrate
Kalahandi


24/10/2019

Collector, Kalahandi

A survey has been carried out by the **District Level Environment Impact Assessment Authority (DEIAA), Kalahandi** with the assistance of Geology Department or Irrigation Department or Forest Department or Public Works Department or Mining Department etc. in the district as per the MoEF, New Delhi, notification S.O. 141(E) dated 15th January 2016 to prepare the District survey Report (DSR) of Kalahandi District (For Sand) in the year 2019.

Forwarded by:

- i. **Sub-Collector cum SDM, Bhawanipatna.**
- ii. **Sub-Collector cum SDM, Dharmagarh.**
- iii. **CDMO, Kalahandi.**
- iv. **Deputy Director Geology, ZS Balangir**
- v. **Deputy Director Agriculture, Kalahandi.**
- vi. **Deputy Director Horticulture, Kalahandi.**
- vii. **SDO Irrigation Division, Kalahandi, Bhawanipatna.**
- viii. **ACF North & South Division, Kalahandi.**
- ix. **Asst. Engineer (R & B), Kalahandi, Bhawanipatna.**
- x. **RO State Pollution Control Board, Rayagada.**
- xi. **Mining Officer, Kalahandi.**
- xii. **Tahasildar of concerned Tahasil.**




Additional District Magistrate
Kalahandi

Collector, Kalahandi

0.0. PREFACE

The main objective of the preparation of District Survey Report (DSR) as per the notification issued by the *Ministry of Environment and Forest and Climate Change Notification No.S.O.3611 (E) New Delhi dated 25/07/2018* and the Sustainable Sand Mining Guidelines is for identification of areas of aggradation or deposition & areas of erosion to ensure the rate of replenishment after mining in an area etc. District Survey Report of Sand mining has been prepared in accordance with *Clause-I of Appendix X* of the said notification.

  
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Additional District Magistrate
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Collector, Kalahandi

01. INTRODUCTION.

The first gazetteer (15 August 1980) of Kalahandi District says that the district comprised of the ex-State Kalahandi minus Kashipur Police Station (the Zamizari of Khariar as Nuapada Sub-division, now Nuapada District). With the merger of princely States with province of Odisha 1948, the ex-State of Kalahandi together with ex-State Patna and Sonepur formed the District of Kalahandi with headquarters at Balangir. On 1st November 1949 Patna and Sonepur areas were separated to form District Balangir; Patna (later Bolangir) Sonepur (later Subarnapur district). And ex-State of Kalahandi, together with Nuapada sub-division which formed a part of Sambalpur district since 1st April 1936, was reconstituted a separate District Kalahandi with Headquarters at Bhawanipatna. As the area comprising Kashipur Police station posed administrative difficulties due to lack of direct communications with the district headquarters, it was separated from Kalahandi on 1st August 1962. Further Nuapada Subdivision was separated on 27 March 1993 from Kalahandi to form new District as Nuapada.

On the basis of Administration Kalahandi District has been divided into 2 Sub-Divisions named as Bhawanipatna & Dharmagarh. As Per the Blocks & Tahasils are concerned the District is divided into 13 Blocks & Tahasils namely Kalahandi, Kesinga, Karlamunda, M.Rampur, Narla, Th.Rampur, Lanjigarh belongs to Bhawanipatna Sub-Division and Jaipatna, Junagarh, Koksara, Golamunda, Kalampur and Dharmagarh belongs to Dharmagarh Sub-Division. There are 310 Gram Panchayat in the District. Kalahandi situated at a distance about 400Km from the state capital & international airport Bhubaneswar and at a distance about 500 Km from the shore line of Bay of Bengal.

Highways like NH-26, SH-16, SH-06, SH-06A, SH44 etc. passes within the district.

02. OVERVIEW OF MINING ACTIVITY IN THE DISTRICT.

A great variety of major mineral potential like Bauxite, Graphite, Galena, Ruby & Iolite and Specified Minor Minerals like Quartz, Feldspar & Decorative Stone (Granite) are available in the district.

Bauxite occurs in Karlapat-Pollingpadar, Kutrumali-Tangridongar, Lanjigarh -Niyamgiri, Keluamali, Krishanmali.

Graphite occurs in Sargipada, Gaidar, Singjharan, Lamer&Badibahal.

Galena occurs in Sisakhal.

Precious Stone (Ruby) occurs in Jhillingdhar, Hinjlibahal, Kerumurda, Sirja, Tandla, Banjipadar, Sargiguda.

Semi-Precious Stone (Iolite) occurs in Dedar, Labanyasar, Bondoguda, Kutingpadar, Ghatpada, Rengali, Dharmagarh, Golamunda and Th.Rampur Tahasil.

Quartz and Quartzite occurs in Kalahandi, Kesinga, Jaipatna, Junagarh, Dharmagarh, M.Rampur, Narla, Koksara, Golamunda, Kalampur Tahasil.

Feldspar occurs in Bhikajharan of Kalahandi Tahasil.

Decorative Stone (Granite) occurs in Lanjigarh & Kalahandi Tahasil.

(a) Major Mineral:-

In Kalahandi district, presently there are eight nos. of mining leases of semiprecious stone out of which only two nos. of mining leases are working i.e. Labanyasar Iolite Mines over an area of 2.505 hectares of Sri Debraj Meher & Bondoguda Iolite Mines over an area of 2.023 hectares of M/s Manikeswari Gems Pvt. Ltd.

(b) Specified Minor Mineral:-

(i) There is one non-working mining lease of decorative stone in village Nuapada, Tahasil-Kalahandi in favour of Sri Harendra Kumar Patnaik. The lease area is 8.575 hectares.

Besides this there are three nos. of prospecting licenses; one is located at Karlasoda village under Kalahandi Tahasil over an area of 13.464

hectares granted in favour of Smt. P. Ramadevi. Another two are located at village Chandanpur under Lanjigarh Tahasil over an area of 3.602 hectares and 9.696 hectares granted in favour of Jay Minerals Prop. Ajay Agrawal.

(ii) There are three nos. of non-working Quartz mines in the district. Out of the three two mining leases are granted in favour of Sri M.N. Patjoshi at village Patharla under Kesinga Tahasil and Santemri under Jaipatna Tahasil over an area of 3.864 & 3.148 hectares respectively. Another mining lease over an area of 18.818 hectares has been granted in favour of Sri Samarendra Pratap Singh Deo at village Sidingpadar under M-Rampur Tahasil.

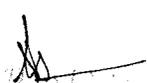
(iii) There is only one non-working Quartz and Feldspar mining lease over an area of 5.147 hectares is granted in favour of Sri M.N. Patjoshi.

(b) Other than specified minor mineral:-

Other than specified minor minerals such as riverbed sand and ordinary stone (road metal) are also available in the district.

03. LIST OF MINING LEASES IN THE DISTRICT WITH LOCATION, AREA & PERIOD OF VALIDITY.

*All required Lease details are given in the prescribed format,
Please refer (Table No. 11.C.01).*





Additional District Magistrate,
Kalahandi.

Collector, Kalahandi

04. DETAILS OF ROYALTY OR REVENUE RECEIVED IN LAST THREE YEARS. (for Sand)

Sl No.	Name of Tahasil	Name of Source	Revenue collected in last three years in INR		
			2016-2017	2017-2018	2018-2019
01	Lanjigarh	-	-	-	-
02	M. Rampur	Turchi Nadighat	-	95,804	96,696
03	Narla	Bhanpur sand Bed	-	-	1,59,000
04	Karlamunda	-	-	-	-
05	Koksara	Mudra River Sand Bed	-	62,806	66,348
06	Kalahandi	Gobra Sand Bed	1,40,000	1,40,000	1,40,000
		Turkel Sand Bed	-	92,426	3,46,680
		Seinpur Sand Bed	3,80,457	4,91,818	3,55,674
		Ajrai Sand Bed	-	-	1,40,000
07	Dharmagarh	Taranjia Sand Bed	51,660	52,920	55,650
		B.Chhendia Sand Bed	54,750	58,950	63,390
		Chhilipa Sand Bed	41,370	47,610	52,470
		Kankeri Sand Bed	44,670	47,580	51,060
08	Kalampur	-	-	-	
09	Jaipatna	-	-	-	
10	Th.Rampur	-	-	-	
11	Junagarh	-	-	-	
12	Kesinga	Kesinga Sand Bed	4,18,000	2,42,000	8,50,000
		Chhenagaon Sand Bed	-	46,000	2,45,000
		Belkhandi Sand Bed	1,74,000	99,000	1,50,000
		Kantesir Sand Bed	-	31,000	89,000
		Digsira Sand Bed	1,55,000	-	-
13	Golamunda	Udeshrung Sand Bed	-	1,08,955	1,14,725
		Chilgaon Sand Bed	-	1,98,685	-
		Pandkul Sand Bed	-	2,92,394	2,92,508
		Kumbhari Sand Bed	-	2,36,806	2,68,606
		Sinapali Sand Bed	-	1,34,955	1,40,635
TOTAL			14,59,907	24,79,709	36,77,442

05. DETAIL OF PRODUCTION OF SAND.

Sl. No.	Name of Tahasil	Name of Source	Production Of Minor Mineral In Last Three Years(Cum)		
			FY 2016-2017	FY 2017-2018	FY 2018-2019
01	Lanjigarh	-	-	-	-
02	M. Rampur	Turchi Nadighat	-	1050	1075
03	Narla	Bhanpur Sand Bed	-	-	3000
04	Karlamunda	-	-	-	-
05	Koksara	Mudra River Sand Bed	-	1206	1307.2
06	Kalahandi	Gobra Sand Bed	2000	2000	2000
		Turkel Sand Bed	-	4000	4000
		Seinpur Sand Bed	6400	6800	7200
		Ajrai Sand Bed	-	-	5000
07	Dharmagarh	Taranjia Sand Bed	1722	1764	1855
		B.Chhendia Sand Bed	1825	1965	2113
		Chhilipa Sand Bed	1379	1587	1749
		Kankeri Sand Bed	1489	1586	1702
08	Kalampur	-	-	-	
09	Jaipatna	-	-	-	
10	Th.Rampur	-	-	-	
11	Junagarh	-	-	-	
12	Kesinga	Kesinga Sand Bed	4600	5290	6100
		Chhenagaon Sand Bed	-	1707	1802
		Belkhandi Sand Bed	4390	5098	6787
		Kantesir Sand Bed	-	6160	6440
		Digsira Sand Bed	4020	-	-
13	Golamunda	Udeshrung Sand Bed	-	2212	2403
		Chilgaon Sand Bed	-	2402	2613
		Pandkul Sand Bed	-	2412	2611
		Kubhari Sand Bed	-	3408	3604
		Sinapali Sand Bed	-	1650	1750
Total			27,825	52,297	65,111.2

06. PROCESS OF DEPOSITION OF SEDIMENTS IN THE RIVERS OF THE DISTRICT.

Fluvial Process of deposition is a geological process on the face of earth, normally controlled by various factors like gradient of the river, velocity of the flowing water, amount of discharge, change in the river channel pattern & chemical precipitation etc. Sediment in rivers gets deposited as the river slows down. Larger, heavier particles like pebbles and sand are deposited first, whilst the lighter silt and clay only settle if the water is almost still. The flow of water is strongest on the outside of river bends, eroding the bank, but is slowest on the inside of the bends, allowing deposition of sand and gravel. When a river "bursts its banks" after heavy rain, flood water spreads out across the floodplain and, because this water hardly moves, finer silt and clay are deposited – often making good farmland.

Kalahandi district is a physically hilly terrain having majorly dendritic drainage pattern, there is only one main river named *Tel River* flows in the district in the northern part of district, in addition to that several immature rivers namely *Hati Nadi*, *Udanti Nadi*, *Sagada Nadi*, *Kamal Nadi*, *Ret Nadi*, *Uttei Nadi* etc. originate & flows in the district also few of them act as the tributary to *Tel River*. The distance of the sources from the river origin is geologically very short, hence this can be concluded that the rate of deposition of sand in *Tel River* is moderate, while in rest rivers within the district the rate of deposit is slow.

**Additional river source details are given in the following tables
Please refer (Table No. 11.A.01) & (Table No. 11.B.01)**

07. GENERAL PROFILE OF THE DISTRICT.

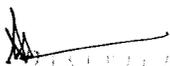
Present Kalahandi District covering a geographical area of 7920 sq km lies in between 19.175489⁰ to 20.454517⁰ North Latitude and 82.617767⁰ to 83.794874⁰ East Longitude having a population of total population of 1,576,869 as per the Census 2011. Out of which 787,101 are males while 789,768 are females. In 2011 there were total 401,251 families residing in Kalahandi district. The District occupies the South Western portion of Odisha, bordered to the North by the Balangir District and Nuapada District, to the South by the Nabarangpur District, Koraput District and Rayagada District, and to the East by the Rayagada, Kandhamal District and Boudh District.

The climate of the Kalahandi District is of extreme type. It is dry except during monsoon. The maximum temperature of the District is 45+ degree Celsius, whereas the minimum temperature recorded is 4⁰ Celsius. The District experiences the average annual rainfall as 1378.20 mm. The monsoon starts late in June and generally lasts up to September. Kalahandi District is largely an agriculture based Economy. The District is rich with agriculture. Dharamgarh sub division was historical known for rice production in Odisha. Since 2000s the Indravati Water Project, second biggest in the state has changed the landscape of southern Kalahandi, leading to two crops in a year. Because of this, blocks like Kalampur, Junagarh, Jaipatna, Dharmagarh are the leading producer of paddy in district. Cotton is widely cultivated in areas of Kesinga, Bhawanipatna, Golamunda blocks.

Forest based products like Mahua, Kendu-Leaf, Wood, Timber and Bamboos also contribute to local economy largely. Kalahandi District supply substantial raw materials to paper mills in neighbouring Rayagada District.

Kalahandi District celebrates many festivals round the year. Chhatra Jatra in Bhawanipatna, Deepawali, Rathajatra, Shivaratri, Holi, Janmastami, Ramanabami are the famous festivals celebrated by local

people with fun and fair. There are also some other local festivals like Khandabasa, Nuakhai, Amnuan, Kandulnuan, Seminuan, Dumernuan, Kalahandi Utsav, Ghanta Jatra that are celebrated in the District. Many eminent personalities have taken birth on the soil of Kalahandi District. Rindo Majhi (freedom fighter in Odisha), Pratab Kesari Deo (former MP and ex- Maharaja of Kalahandi), Chakra Bisoi (freedom fighter), Ram Chandra Patra (bureaucrat, social worker, administrator), Natyarashmi Prafulla Ratha, Dayanidhi Nayak (former minister), Jayanta Kumar Behera (social activist and artist) and mountaineer Jogabyasa Bhoi (first from district to climb Mount Everest) are a few among them.



Additional District Magistrate
Kalahandi

Collector, Kalahandi

08. LAND UTILIZATION PATTERN IN THE DISTRICT: FOREST, AGRICULTURE, HORTICULTURE, MINING ETC.

General land information of Kalahandi district is as follows;

Forest:

Forest land use as per the concern authority is as follows;

Abstract of area statement of Kalahandi North Division

SL. N O	Legal status of the forest Blocks	Name of the Range										Total	
		Bhawanipatna		M.Rampur		Narla		Kesinga		Kegoon		No.o f Block s	Area in Ha.
		No. of Blo cks	Area in Ha.	No. of Blo cks	Area in Ha.	No. of Blo cks	Area in Ha.	No.o f Block s	Area in Ha.	No.o f Block s	Area in Ha.		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Reserve Forest	12	15653.00	11	21475.00	7	15141.00	3	9824.00	10	20521.00	43	82614.00
2	P.F.	-	-	-	-	-	-	-	-	-	-	-	-
3	PRF notified u/s-4	1	6720.20	11	15174.98	6	4469.44	-	-	-	-	18	26364.62
4	PRF not notified u/s-4	2	9255.70	9	2551.08	5	4787.93	6	727.14	16	1285.75	38	18607.60
5	Village Forest	14	89.524	3	12.638	-	-	12	77.76	1	20.00	30	199.65
6	Non Forest land mutated in favour of FD	1	436.00	-	-	-	-	-	-	-	-	1	436.00
Total =		30	32154.42	34	39213.43	18	24398.37	21	10628.90	27	21826.75	130	128221.87

Abstract of area statement of Kalahandi South Division

SL. NO	Legal status of the forest Blocks	Name of the Range														Total	
		Biswanathpur		Dharmagarh		Jaipatna		Junagarh		Th.Rampur North		Th.Rampur South		Karlapat		No. of Blocks	Area in Ha.
		No. of Blocks	Area in Ha.	No. of Blocks	Area in Ha.	No. of Blocks	Area in Ha.	No. of Blocks	Area in Ha.	No. of Blocks	Area in Ha.	No. of Blocks	Area in Ha.				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
1	Reserve Forest	16	17139.00	5	13083.00	8	2992.00	7	5239.00	9	717.00	4	6086.00	-	-	49	45256.00
2	P.F.	1	17.483	-	-	-	-	-	-	-	-	-	-	-	-	1	17.483
3	PRF notified u/s-4	9	11349.02	-	-	-	-	2	327.10	7	9288.59	3	756.19	1	462.00	22	22182.90
4	PRF not notified u/s-4	10	1480.32	-	-	-	-	6	3453.02	1	346.00	-	-	1	760.17	18	6039.51
5	Village Forest	-	-	1	20.00	-	-	-	-	3	20.00	6	60.00	-	-	10	100.00
6	Non Forest land mutated in favour of FD	2	43.261	-	-	1	25.40	-	-	1	22.416	5	322.953	-	-	9	414.03
Total =		38	30029.08	6	13103.00	9	3017.40	15	9019.21	21	10394.01	18	7225.14	2	1222.17	109	74009.92

Agriculture:

Sl. No				High	Med.	Low	
1	Geographical area			Ha.			792000
2	Cultivable area			Ha.	237856	85279	67865
3	Forest area			Ha.			314000
4	Misc. Tree & Grooves			Ha.			8000
5	Permanent Pasture			Ha.			23000
6	Culturable Waste			Ha.			21000

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Deputy

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Kalahandi.

Collector, Kalahandi

7	Land put to non agriculture. Use			Ha.				35000
8	Net shown area		Kharif-2018	Ha.				383721
9	Gross crop area		2018-19	Ha.				600030
10	Cropping intensity		2018-19	Ha.				156%
11	Irrigated area		Kharif-2018	Ha.				143688
12			Rabi 2018-19	Ha.				84721
13	Cultivated area		For 2019	Ha.	217139	90962	75620	383721
14	Paddy area		For 2019	Ha.	46976	79261	75620	201857
15	Non paddy area		For 2019	Ha.	170163	11701	0	181865
16	DAO Circle			Nos.				4
17	AAO Circle			Nos.				26
18	AC/VAW Circle			Nos.				310

Horticulture:

Details of the land use given by concern authority is as follows;

Sl. No	Crop	Area (in Hects)
1	Fruits	17944.00
2	Plantation Crops	2100.00
3	Spices	5389.00
4	Vegetables	23300.00
5	Flowers	269.00
Total =		49002.00

Mining:

The total area considered for mining activity for all minerals shall be the mining area within the district.

Additional District Magistrate
Kalahandi

Collector, Kalahandi

09. PHYSIOGRAPHY OF THE DISTRICT.

The district Kalahandi is situated at the south western part of Odisha constituting part of Western Ghat Mobile Belt normally a rugged hilly terrain. The district covers a number of new series Topo Sheets i.e. F44W16, E44E9, E44E10, E44E11, E44E13, E44E14, E44E15, E44E16, F44X3, F44X4, F44X7, F44X8, F44X11, F44X12, F44X16, E44F1, E44F2, E44F3, E44F5 & E44F6.

Kalahandi district is physiologically a complex terrain having numerous numbers of hills, moulds, plane lands, river beds, agricultural lands, forest growth areas etc. In the southern most part of the district there is Indravati Reservoir catchment area which is also shared by Nawarangpur district. Adjacent to reservoir catchment area hilly terrain present which have an elevation range from mean sea level about 700m to 1000m. Hills and mounts are more common in the south to Bhawanipatna where as in the north part the is less hills compered to southern part possesses an elevation range between 250m to 800m from MSL. As the district is a part of Eastern Ghat Mobile Belt so the rock types are mostly homogeneous in nature, so the drainage pattern developed in the region is dendritic pattern. The main drainage trend flows from the south-west to north-east direction within the district. There are several seasonal nala / dry nala & a few perineal natural drainage exists within the district. Main river that touches the district is *Tel River*, in addition to that a few other small rivers present within the distict namely *Hati Nadi*, *Udanti Nadi*, *Sagada Nadi*, *Kamal Nadi*, *Ret Nadi*, *Uttei Nadi* etc.

The main township that is developed in the district is Bhawanipatna also is the district head quarter, which is present in the central part of the district and connect to all parts of the district through road ways.

There are a number of reserve forests present within the district a few major RF are namely *Benakhamar RF*, *Udaygiri RF*, *Singari RF*, *Gopalpur RF*, *Indravati RF*, *Phatadhara RF*, *Machul RF*, *Hatisal RF*, *Kiding RF*, *Bazargarh RF*, *Benagurha RF*, *Urladani RF*, *Taprang RF*, *Telan RF*, *Satami RF*, *Sulia Block A RF* ect. In addition to the reserve forests there is a wild life sanctuary present in the district namely *Karlapat Wild life sanctuary*.

10. RAINFALL: MONTH-WISE.

The climate of the Kalahandi District is of extreme type. It is dry except during monsoon. The maximum temperature of the District is 45+ degree Celsius, whereas the minimum temperature recorded as 4⁰Celsius. The District experiences the average annual rainfall as 1664.633 mm. The monsoon starts late in June and generally lasts up to September.

MONTH WISE RAINFALL DATA OF KALAHANDI DISTRICT

Year	2017	2018	2019
MONTH	AVERAGE RAINFALL in mm	AVERAGE RAINFALL in mm	AVERAGE RAINFALL in mm
January	0	0	1.82
February	0	0	6.2
March	15.52	0	8.63
April	2.46	14.52	10.54
May	16.5	40.12	23.48
June	209.64	106.44	156.98
July	511.85	652.15	454.07
August	342.65	815.76	657.01
September	208.94	231.42	253.3
October	116.66	59.88	--
November	1.16	0	--
December	0	76.18	--
Total	1425.38	1996.47	1572.05

11. GEOLOGY AND MINERAL WEALTH.

Geology:

Kalahandi District is part of Eastern Ghat Super Group, the Eastern Ghats are a discontinuous range of mountains along India's eastern coast. The Eastern Ghats run from the northern Odisha through Andhra Pradesh to Tamil Nadu in the south passing some parts of Karnataka and in the Wayanad district of Kerala. They are eroded and cut through by four major rivers of peninsular India, viz. Godavari, Mahanadi, Krishna, and Kaveri.

The mountain ranges run parallel to the Bay of Bengal. The Deccan Plateau lies to the west of the range, between the Eastern Ghats and Western Ghats. The coastal plains, including the Coromandel Coast region, lie between the Eastern Ghats and the Bay of Bengal. The Eastern Ghats are not as high as the Western Ghats. The Eastern Ghats are older than the Western Ghats, and have a complex geologic history related to the assembly and breakup of the ancient supercontinent of Rodinia and the assembly of the Gondwana supercontinent.

The Eastern Ghats on the east coast of India is a largely granulite terrain but also exposes granites, migmatites, anorthosites and alkaline rocks. This granulite belt has had a prolonged history of mountain building from late Archaean to late Proterozoic. During this long period the Eastern Ghats mobile belt witnessed repeated folding and possibly polycyclic metamorphism. Some recent findings suggest breaks between orogenic cycles and a proterozoic reworking of Archaean granulites. Extreme-temperature crustal metamorphism under fluid-absent conditions and crustal anatexis in huge thickness of pelitic to psammitic protoliths producing leptynites are some of the important results of recent investigations of the Eastern Ghats mobile belt. Different generation of charnockites are present in the Eastern Ghats belt, but charnockitisation of granitic gneisses is yet to be documented. Some apparently nascent

growths, the patchy charnockites in the Chilka area are shown to be relict of older charnockitic rocks that suffered granulite-facies metamorphism and attendant migmatisation.

Event Stratigraphy of the Eastern Ghat Mobile Belt is as follows;

Age(Ma)	Event		
550-650	Exhumation & Stabilisation(Pan-African)		
800-850	Emplacement of Anorthosite Massifs, Some Alkaline Rocks(?) Younger Granitoids are charnokites		
950-1100	Main Eastern Ghat Orogeny(=Grenville)		
	<table border="1"> <tr> <td>Khondalite Group</td> <td> Garnet-Sillimanite- Graphite Gneiss(Khondalite) with minor cordierite-Saphrine-Spinel Gneiss(Mg-Al) Calc- Silicate rocks & rare Marbles Quartzite (Garnet ± Sillimanite) </td> </tr> </table>	Khondalite Group	Garnet-Sillimanite- Graphite Gneiss(Khondalite) with minor cordierite-Saphrine-Spinel Gneiss(Mg-Al) Calc- Silicate rocks & rare Marbles Quartzite (Garnet ± Sillimanite)
Khondalite Group	Garnet-Sillimanite- Graphite Gneiss(Khondalite) with minor cordierite-Saphrine-Spinel Gneiss(Mg-Al) Calc- Silicate rocks & rare Marbles Quartzite (Garnet ± Sillimanite)		
~1500	Emplacement of Alkaline rocks along with the rift Margin		
	<table border="1"> <tr> <td>1800-1600</td> <td> Evolution of platform(Purana) basins like Cuddahpah ,Chhatishgarh, Indravati etc. Evolution of Nellore-Khemmam schist belt in Dharwar Craton </td> </tr> </table>	1800-1600	Evolution of platform(Purana) basins like Cuddahpah ,Chhatishgarh, Indravati etc. Evolution of Nellore-Khemmam schist belt in Dharwar Craton
1800-1600	Evolution of platform(Purana) basins like Cuddahpah ,Chhatishgarh, Indravati etc. Evolution of Nellore-Khemmam schist belt in Dharwar Craton		
2600-2800	Charnokite & Gneisses of the basement(WCZ).		

Mineral wealth:

A great variety of major mineral potential like Bauxite, Graphite, Galena, Ruby & Iolite and Specified Minor Minerals like Quartz, Feldspar & Decorative Stone (Granite) are available in the district.

Bauxite occurs in Karlapat-Pollingpadar, Kutrumali-Tangridongar, Lanjigarh -Niyamgiri, Keluamali, Krishanmali.

Graphite occurs in Sargipada, Gaidar, Singjharan, Lamer&Badibahal.

Galena occurs in Sisakhal.

Precious Stone (Ruby) occurs in Jhillingdhar, Hinjlibahal, Kerumurda, Sirja, Tandla, Banjipadar, Sargiguda.

Semi-Precious Stone (Iolite) occurs in Dedar, Labanyasar, Bondoguda, Kutingpadar, Ghatpada, Rengali, Dharmagarh, Golamunda and Th.RampurTahasil.

Quartz and Quartzite occurs in Kalahandi, Kesinga, Jaipatna, Junagarh, Dharmagarh, M.Rampur, Narla, Koksara, Golamunda, KalampurTahasil.

Feldspar occurs in Bhikajharan of KalahandiTahasil.

Decorative Stone (Granite) occurs in Lanjigarh & Kalahandi Tahasil.

Reserve & Resource potential Evaluation;

As per UNFC (*United Nations Framework Classification*) of potentials of minerals, A '**Mineral Reserve**' is the economically mineable part of a Measured and/or Indicated Mineral Resource. It includes diluting materials and allowances for losses which may occur when the material is mined. Appropriate assessments, which may include feasibility studies, have been carried out, and include consideration of, and modification by, realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors. These assessments demonstrate at the time of reporting that extraction is justified.

The mineability (Economic Viability) is demonstrated in consecutive Feasibility Assessment stages which may be, in order of increasing detail, Prefeasibility Study and Feasibility Study/Mining Report. A Probable Mineral Reserve may derive from a Prefeasibility study and a Proved Mineral Reserve from a Feasibility Study or mining activity

documentation. Hence for the Reserve Potential estimation of the Kalahandi district, the approved Mining Plans of each existing Quarry has been referred as it provides a details of the Mineable & Geological Reserve potentials of the Quarry lease.

As per the approved Mining Plans of the quarry leases till September-2019 in Kalahandi District the Total mineral potential are as follows;

Potential Reserve as per Approved Mining plan of Existing Sources of Sand

Sl No.	Name of Tahasil	Name of Source	Geological reserve as per approved Mining Plan of existing quarries (in m ³)	Mineable reserve as per approved Mining Plan of existing quarries (in m ³)
01	M-Rampur	Turuchi Sand Bed	9013	6806
02	Narla	Bhanpur Sand Bed	50586	33633
03	karlamunda	Barpadar Sand Bed	78913	51205
04	karlamunda	Deogaon Sand Bed	16725.5	13585.5
05	karlamunda	Kundeipali Sand Bed	90265.5	73347
06	karlamunda	Teresinga Sand Bed	84630	64954.5
07	Karlamunda	Pourkela Sand Bed	78913.5	64353
08	Karlamunda	Putigaon sand Bed	50340	19830
09	Karlamunda	Legda Sand Bed	114891	68935
10	Kalahandi	Turkel Sand Bed	100038	21476

		of applicant Sabitri Jaiswal		
11	Kalahandi	Turkel Sand Bed	99956	86784
12	Kalahandi	Ajarai Sand Bed	22578	16479
13	Kalahandi	Bargaon Sand Bed	85296	18689
14	Kalahandi	Gobra Sand Bed	16666	10000
15	Kalahandi	Seinpur Sand Bed	55666	33400
16	Kalahandi	Jojana Nuaada sand Bed	12500	7500
17	Kesinga	Kesinga Sand Bed	60500	54000
18	Kesinga	Chhenagaon Sand Bed	74967	55399
19	Kesinga	Belkhandi Sand Bed	75877	51993
20	Kesinga	Kantesir Sand Bed	56400	49500
21	Kesinga	Digsira Sand Bed	53000	45000
22	Kesinga	Jolko sand Bed	74967	23529
23	Kesinga	Patharla Sand Bed	50586	33147
24	Kesinga	Gokuleswar Sand Bed	40468	13460
25	Kesinga	Kanabira Sand Bed	7972	5200
26	Dharmagarh	Brahmana Chhendia sand Bed	49978	37646
27	Dharmagarh	Kankeri Sand Bed	50181	40880
28	Dharmagarh	Taranja Sand Bed	50586	39853

29	Dharmagarh	Chhilipa Sand Bed	62743	37646
30	koksara	Mudra River Sand Bed	31565.4	18569.4
31	kalampur	Khangarguda River Sand Bed	37286	22918
32	kalampur	Deypur River Sand Bed	31656.4	21812.4
33	kalampur	Patrabasa River Sand Bed	31565.4	18907.7
34	Golamunda	Udeshrung Sand Bed	75028	59323
35	Golamunda	Chiligaon Sand Bed	75028	61237
36	Golamunda	Pandkul Sand Bed	75028	63079
37	Golamunda	Kumbhari Sand Bed	75028	64470
38	Golamunda	Sinapali sand Bed	750315	30069
Total			2857703	1438616

Similarly, as per UNFC (*United Nations Framework Classification*) of potentials of minerals A '**Mineral Resource**' is a concentration or occurrence of material of intrinsic economic interest in or on the Earth's crust in such form, quality and quantity that these are reasonable prospects for eventual economic extraction. The location, quantity, grade, geological characteristics and continuity of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge.

The resource figures are quoted as being of intrinsic economic interest, depending on the results of a Prefeasibility Study and feasibility Study. Generally, only in-situ resource figures are reported at this stage of

geological assessment. Mineral Resources are subdivided, in order of increasing geological confidence, into inferred, indicated and measured categories. Portions of a deposit that do not have reasonable prospects for eventual economic extraction must not be included in a Mineral Resource.

For assessment of potential resources of *New sairat sources of Sand*, a joint field survey has been done and sources has been identified. At this stage of survey, a detail study of each source is not feasible, hence the sand area of proposed quarry lease has been multiplied with the average sand bed thickness of the respective source to obtain the Geological resources whereas for Mineable resources has been considered about 60% of geological Resources.

Potential Resource of LOI issued Existing Sairat Sources (Mining Plan not Obtained) & New Sairat Sources for Sand

Sl No.	Name of Tahasil	Name of Proposed source with Land Schedule.	Area covered with sand within the lease, normally varies from 60% to 90% as per field observation in m ²	Average sand Bed thickness of proposed source in meter	Tentative geological Resource of Proposed Source in m ³	Tentative Mineable Resource of Proposed Source i.e. 60% of geological Resources in m ³
01	M Rampur	Ghodapokhari Sand Bed, Khata No-278, Plot No- 1899, 12.00Ac	30000	0.7	21000	12600
02	M Rampur	Dam Karlakhunta Sand Bed, Khata No-91, Plot No- 181, 3.00 Ac	6070	0.5	3035	1821
03	M Rampur	Duta Sand Bed, Khata No-139, Plot No-353, 10.00Ac.	28328	0.7	19830	11898
04	M Rampur	Ainlapali Sand Bed, Khata No-173, Plot No-607, 2.47 Ac.	6070	0.7	4249	2549
05	Narla	Sargiguda Sand Bed, Khata No-229, Plot No-132, 1.00Ac	3237	0.5	1618	971

06	Narla	Bilat Sand Bed, Khata No-120, Plot No-137, 1.10Ac	3237	0.4	1294	776
07	Narla	Lakhguda Sand Bed, Khata no-104, Plot No-391, 2.80Ac	8093	0.5	4046	2428
08	Narla	Dahal Sand Bed, Khata No.76, Plot No.1, 1 acre	3237	0.4	1295	777
09	Narla	Pujipadar Sand Bed, Khata No.134, Plot No.631, 1 acre	3237	0.3	971	582
10	Narla	Burdipada Sand Bed, Khata No.250, Plot No.1006, 2.80 acre	8093	0.5	4046	2428
11	Narla	Brahmani Sand Bed, Khata No.107, Plot No.1, 1 acre	3237	0.3	971	582
12	Narla	Jodabandha Sand Bed, Khata No.132, Plot No.1, 1 acre	3237	0.5	1618	971
13	Narla	Ratul Sand Bed, Khata No.117, Plot No.89, 5.77 acres	12140	0.4	4856	2913
14	Narla	Badachiching sand Bed, Khata No.88, Plot No.221, 4 acres	12140	0.6	7284	4370
15	Narla	Sanachiching Sand Bed, Khata No.87, Plot No.431, 3.95 acres	12140	0.4	4856	2913
16	Narla	Dhoben sand Bed, Khata No.176, Plot No.1, 2 acres	4046	0.5	2023	1214
17	Narla	Ghuguti Sand Bed, Khata No.130, plot no.1120 & 1122, 1 acre	3237	0.3	971	582
18	Narla	Ulikupa Sand Bed, Khata No. 270, Plot No.301, 3 acres	8093	0.4	3237	1942
19	Narla	Kanagaon Sand Bed, Khata No.78, plot no.291, 2 acres	6070	0.3	1821	1092
20	Kalahandi	Borda Sand Bed, Khata No-527, Plot No-2636, 7.88 Ac	20234	1.0	2023	1214
21	Kalahandi	Karlapada Sand Bed, Khata No-197, Plot No-09, 6.10 ac	20234	0.5	10117	60702
22	Kalahandi	Pastipada Sand Bed, khata No- 155, plot No-01, 3.00 Ac.	5000	0.1	500	300

23	Kalahandi	Chahagaon Sand Bed, Khata No-164, Plot no-01, 3.00 Ac	6070	0.7	4249	2549
24	Kalahandi	Sagada Sand Bed, Khata No-132, Plot No-1084, 4.80 Ac	7000	1.0	700	420
25	Kalahandi	Kusumdar Sand Bed, Khata No-96, Plot No-958, 4.88 Ac	7000	0.7	4900	2940
26	Kalahandi	Gandbasa Sand Bed, Khata No-109, Plot No-81, 5.00 Ac	7000	0.7	4900	2940
27	Kalahandi	Borda- 2 Sand Bed, Khata No-527, Plot No-2238, 3.50 Ac	10117	0.7	7082	4249
28	Kalahandi	Sapsilet Sand Bed, Khata No-311, Plot No-895, 3.50 Ac	10117	1.8	18210	10926
29	Kalahandi	Paikpada Sand Bed, Khata No-155, Plot No-1/580, 6.00 Ac	16187	1.8	29136	17481
30	Kalahandi	Pastipada- 2 Sand Bed, Khata No-155, Plot No-955, 2.00Ac	3000	0.1	300	180
31	Kalahandi	Borda Sand Bed, Khata No-527, Plot No-2429, 12.60 Ac	30000	1.8	54000	32400
32	Kalahandi	Artal Sand Bed, Khata No-349, Plot No-42, 12.50 Ac	30000	1.8	54000	32400
33	Kalahandi	Bileikuni Sand Bed, Khata No-168, Plot No-983, 12.00 Ac	30000	0.5	15000	9000
34	Kalahandi	Themra Sand Bed, Khata No-236, Plot No-01, 10.00 Ac	28300	1.8	50940	30564
35	Kalahandi	Jojana Nuada- 1 Sand Bed, Khata No-4,146,158, Plot No-9,43,311, 12.35 Ac	30000	0.7	21000	12600
36	Dharmagarh	Chilchila Sand Bed, Khata No.411 Plot No. 01	24840	1.8	44712	26827
37	Dharmagarh	Chhilipa Sand Bed, Khata No.528 Plot No. 1043/2679	21000	2.5	52500	31500
38	Dharmagarh	Tambachhada Sand Bed, Khata No.275 Plot No. 01/1170	25920	1.5	38880	23328
39	Dharmagarh	Telipalash Sand Bed, Khata No. 297 Plot No. 195	27600	1.2	33120	19872
40	Dharmagarh	Sandhikulihari Sand Bed, Khata No. 518 Plot No. 2678	46080	1.5	69120	41472

41	Dharmagarh	Kanagaon Sand Bed, Khata No. 369 Plot No. 1711	16320	1.5	24480	14688
42	Dharmagarh	Luhagaon Sand Bed, Khata No. 467 Plot No. 1819	15075	1.3	19597	11758
43	Koksara	Kaudala Sand Bed, Khata no. 888 (Hal) Plot No. 2215,	17563	0.1	1756	1053
44	Koksara	Kaudala Sand Bed, Khata no. 888 (Hal) Plot No. 1894	34398	0.1	3439	2063
45	Koksara	Chilguda Sand Bed, Khata no. 342 Plot No. 354	16164	0.8	12931	7758
46	Koksara	Dahagaon sand Bed, Khata No-11, Plot No-1897(A)	8093	0.5	4046	2427
47	Koksara	Dahagaon sand Bed, Khata No-11, Plot No-1897(B)	6677	0.5	3338	2003
48	Koksara	Khuntia Sand Bed, Khata No-266, Plot No-383	20234	0.5	10117	6070
49	Koksara	Ainly Sand Bed, Khata No-261, Plot No-1100(A)	10845	0.1	1084	650
50	Koksara	Ainly Sand Bed, Khata No-261, Plot No-1100(B)	16187	0.1	1618	971
51	Koksara	Ainly Sand Bed, Khata No-261, Plot No-1100(C)	11735	0.1	1173	704
52	Koksara	Sunamal Sand Bed, Khata No-440, Plot No-1490 & 1505	6070	0.7	4249	2549
53	Junagarh	Habaspur Sand Bed, Khata No-559, Plot No-1566, 8.30Ac	20234	1.7	34399	20639
54	Junagarh	Karchala Sand Bed, Khata No-439, Plot No-1681, 14.00Ac	32375	1.7	55038	33023
55	Junagarh	Dasigaon Sand Bed, Khata No-10, Plot No-788 & 1, 11.00Ac	28328	1.3	36827	22096
56	Junagarh	Atigaon Sand Bed, Khata No-361, Plot No-768, 12.50Ac	28328	1.8	50991	30594

57	Junagarh	Kandulguda Sand Bed, Khata No-244, Plot No-795, 1.00Ac	2023	1.8	3642	2185
58	Junagarh	Budhipadar Sand Bed, khata No-5&285, Plot No-29&1, 11.00Ac	24281	1.3	31566	18939
59	Junagarh	Chingudisar Sand Bed, khata No-138, Plot No-01, 3.40Ac	8093	1.7	13759	8255
60	Junagarh	Panigaon Sand Bed, Khata No-188, Plot No-01, 5.00Ac	12140	1.3	15783	9469
Total					934243	615167

The total Tentative Geological & Mineable sand potential of the district shall be the sum of existing reserve and the proposed resource calculated in the above tables, the potentials are as follows;

Category	Tentative Geological potential in m ³	Tentative Mineable Potential in m ³
Existing sources	2857703	1438616
Proposed sources	934243	615167
Total potential	3791946	2053783

As in nature the replenishment of sand is a natural process within the river bed, hence the estimated potential may vary in each successive year.

(a) District wise details of river or stream and other sand source;

Annexure-I

In Kalahandi District River beds and streams are the only source of Sand, hence the details of the main river and streams are given in the following table:

Drainage system with description of main river (Table No. 11.A.01)

Sl no.	Name of river	Area (sq. km drained)	% area drained in the District
01	Tel River	2850	60%
02	Hati River	735	100%
03	Udanti River	1800	100%
04	Sagada River	360	100%
05	Kamal River	350	100%
06	Ret River	810	100%
07	Uttei River	420	100%

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(b) District wise availability of sand or gravel or aggregate resources;

Annexure-II

In this case only **Sand** has been considered

Salient Features of Important Rivers and Streams: (Table No. 11.B.01)

S. No	Name of the River or Stream	Total Length in the District (in Km)	Place of origin	Altitude at Origin	Portion of the River or Stream Recommended for Mineral Concession	Length of area recommended for mineral concession (in Km)	Average width of area recommended for mineral concession (in meters)	Area recommended for mineral concession (in Sq. meter)	Mineable mineral potential (in m ³) (60% of total mineral potential)
01	Tel River	123.60	Krushu in Nawarangpur district	551m	Details provided in the Table No. 11.C.01 for each existing leases and for proposed leases details provided in the Resource table.				2053783
02	Hati River	86.80	Merakani in Nawarangpur District	530m					
03	Udanti River	32.00	Chhatishgarh	396m					
04	Sagada River	45.00	Poiguda in Kalahandi district	492m					
05	Kamal River	35.00	Pipalguda in Kalahandi district	334m					
06	Ret River	79.00	Patangpadar in Kalahandi district	570m					
07	Uttei River	45.00	Belghar in Kandhamal District	726m					

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(c) District wise details of existing mining leases of sand and aggregates;

Annexure-III

In this case only Sand has been considered.

(Table No. 11.C.01)

Name of Tahasil	Sl. No	Name of the Mineral	Name of the Lessee	Address of Lessee	Mining lease Grant Order No. & date	Area of Mining lease (ha)	Period of Mining lease (Initial		Date of commencement of Mining Operation	Status (Working/NonWorking/Temp. Working for dispatch etc.	Obtained Environmental Clearance (Yes/No)	Location of the Mining lease (Latitude & Longitude)
							7 From	8 To				
M. Rampur	01	Turchi Sand Bed	SachidanandaSahu	Turchi	--	5.261	2015-16	2019-20	16.06.2017	Working	Yes	20°15'05.99"N 83°27'08.30"E
Narla	02	Bhanpur Sand Bed	Arjun Pradhan	Mursingh	--	5.050	2016-17	2020-21	05.05.2018	Working	Yes	20°07'22.05"N 83°22'50.04"E
Narla	03	Sargiguda Sand Bed	Binodini Infrastructure Ltd	Bhubaneswar	-	0.404	-	-	-	Non-Working	No	
Narla	04	Bilat Sand Bed	Durga Prasad Mohanty	Rupra Road	-	0.445	-	-	-	Non-Working	No	
Narla	05	Lakhguda Sand Bed	Durga Prasad Mohanty	Rupra Road	-	1.133	-	-	-	Non-Working	No	
Karlamunda	06	Borpadar Sand Bed	MukeshAgrawal	Kesinga	176/Tauzi 29.01.16	5.260	2016-17	2020-21	--	Non- Working	No	20°17'26.38"N 83°27'46.47"E
Karlamunda	07	Deogaon Sand Bed	Aditya Prasad Sahu	Takarumal	199/Tauzi 02.02.16	6.630	2016-17	2020-21	--	Non- Working	No	20°19'23.58"N 83°26'41.06"E
Karlamunda	08	Kundeipali Sand Bed	MukeshAgrawal	Kesinga	103/Tauzi 22.01.16	6.000	2016-17	2020-21	--	Non- Working	No	20°25'30.00"N 83°27'10.00"E
Karlamunda	09	Teresinga Sand Bed	MukeshAgrawal	Kesinga	105/Tauzi 22.01.16	5.620	2016-17	2020-21	--	Non-Working	No	
Karlamunda	10	Pourkela Sand Bed	MukeshAgrawal	Kesinga	109/Tauzi 22.01.16	5.260	2016-17	2020-21	-	Non-Working	No	20°26'19.63"N 83°28'13.12"E
Karlamunda	11	Putigaon sand Bed	MukeshAgrawal	Kesinga	101/Tauzi 22.01.16	5.060	2016-17	2020-21	-	Non-Working	No	20°21'39.14"N 83°24'08.74"E
Karlamunda	12	Legada Sand Bed	MukeshAgrawal	Kesinga	174/Tauzi 29.01.16	6.750	2016-17	2020-21	-	Non-Working	No	
Kalahandi	13	Turkei Sand Bed	SabitrivediJaiswal	Bhawani patna	15.12.2016	5.000	2016-17	2020-21	05.05.2017	Working	Yes	20°08'33.10"N 83°05'20.30"E



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Kalahandi	14	Turkel Sand Bed	Tahasildar Kalahandi	Bhwanipatna	-	5.000	-	-	-	Working	Yes	
Kalahandi	15	Ajarai Sand Bed	SanjeevBhoi	Artal	27.03.2015	8.134	2018-19	2023-24	17.01.2019	Working	Yes	20° 08' 45.21"N 83°01' 48.32"E
Kalahandi	16	Bargaon Sand Bed	RajeshSahu	Gobra	16.03.2015	7.498	2016-17	2021-22	13.02.2017	Working	Yes	20° 08' 54.16"N 83°02' 02.93"E
Kalahandi	17	GobraSand Bed	Rajesh Sahu	Gobra	16.03.2015	6.576	2016-17	2021-22	13.02.2017	Working	Yes	
Kalahandi	18	SeinpurSand Bed	Rajesh Thakur	Bhawani patna	16.03.2015	9.817	2015-16	2020-21	31.12.2015	Working	Yes	20° 08' 27.20"N 83°05' 16.90"E
Kalahandi	19	JojanaNuapada sand Bed	Purna Ch. Sahu	Bhawani patna	23.03.2015	1.732	-	-	-	Non-Working	No	
Kesinga	20	Kesinga Sand Bed	Bishnu Prasad Bansal	Kesinga	-	6.070	2016-17	2020-21	12.04.16	Working	Yes	20°11' 42.50"N 83°12' 34.90" E
Kesinga	21	Chhenagaon Sand Bed	Smt. SaranjeetKour	Bh. Patna	-	5.261	2018-19	2022-23	30.01.18	Working	Yes	20°08' 42.22"N 83°07' 17.81"E
Kesinga	22	Belkhandi Sand Bed	MukeshAgrawal	Kesinga	-	5.058	2017-18	2021-22	04.12.17	Working	Yes	20°21' 18.69"N 83°24' 12.37"E
Kesinga	23	Kantesir Sand Bed	Shiv Ku. Bansal	Kesinga	-	5.520	2017-18	2021-22	20.11.17	Non-Working	Yes	20°13' 29.80"N 83°14' 17.20"E
Kesinga	24	Digsira Sand Bed	Shiv Ku. Bansal	Kesinga	-	5.261	2016-17	2020-21	12.04.16	Non-Working	Yes	20°20' 15.50"N 83°23' 01.30"E
Kesinga	25	Jolko sand Bed	TejuramAgrawal	Kesinga	2112-26.08.16	4.990	2016-17	2020-21	-	Non-Working	No	20°09' 59.14"N 83°11' 13.18"E
Kesinga	26	Patharla Sand Bed	MukeshAgrawal	Kesinga	530-02.03.19	5.050	2018-19	2022-23	-	Non-Working	No	20°10' 10.17"N 83°10' 17.03"E
Kesinga	27	Gokuleswar Sand Bed	BishnuMajhi	Gokuleswar	529-02.03.19	4.040	2018-19	2022-23	-	Non-Working	No	20°02' 34.40"N 83°12' 40.13"E
Kesinga	28	Kanabira Sand Bed	BishnuMajhi	Gokuleswar	529-02.03.19	0.800	2018-19	2022-23	-	Non-Working	No	20°04' 06.14"N 83°13' 14.26"E
Dharmagarh	29	Brahmana Chhendia sand Bed	Jyotirmaya Singh	Dharmagarh	-	5.000	2015-16	2019-20	-	Working	Yes	19°54' 50.00"N 82°47' 55.00"E
Dharmagarh	30	Kankeri Sand Bed	Jyotirmaya Singh	Dharmagarh	-	5.010	2015-16	2019-20	-	Working	Yes	19°54' 01.00"N 82°44' 48.00"E
Dharmagarh	31	Taranja Sand Bed-	GajindraPradhan	Dharmagarh	-	5.058	2015-16	2019-20	-	Working	Yes	19° 54' 33.80"N 82°49' 17.14"E

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Dharmagarh	32	Chhilipa Sand Bed								-	Working	Yes	19° 53' 15.10" N 82° 43' 44.30" E
Koksara	33	Mudra River Sand Bed	Kishor Chandra Naik	Sarasma I		5.260	2015-16	2019-20		-	Working	Yes	19° 42' 22.50" N 82° 44' 15.30" E
Kalampur	34	Khangarguda River Sand Bed	Santosh Kumar Naik	Gautam nagar, Koraput	8188-23.11.15	5.050	2015-16	2019-20		-	Non-Working	No	19° 35' 45.60" N 82° 52' 20.20" E
Kalampur	35	Deypur River Sand Bed	Santosh Kumar Naik	Gautam nagar, Koraput	2184-23.11.15	5.260	2015-16	2019-20		-	Non-Working	No	19° 39' 53.40" N 82° 53' 08.10" E
Kalampur	36	Patrabasa River Sand Bed	Santosh Kumar Naik	Gautam nagar, Koraput	8186-23.11.15	5.260	2015-16	2019-20		-	Non-Working	No	19° 35' 07.49" N 82° 51' 46.50" E
Golamunda	37	Udeshrung Sand Bed	Bruhaspati Sahu	At/Po-Mahaling Kalahandi	-	5.000	2016-17	2020-21		-	Working	Yes	20° 06' 25.44" N 82° 49' 40.50" E
Golamunda	38	Chilgaon Sand Bed	Basanta Bhoi	FundaKalahandi Odisha	-	5.000	2016-17	2020-21		-	Working	Yes	19° 55' 45.40" N 82° 55' 21.20" E
Golamunda	39	Pandkul Sand Bed	Susantakumar Bhoi	FundaKalahandi	-	5.000	2016-17	2020-21		-	Working	Yes	19° 55' 28.20" N 82° 51' 16.60" E
Golamunda	40	Kumbhari Sand Bed	Susantakumar Bhoi	FundaKalahandi	-	5.000	2016-17	2020-21		-	Working	Yes	19° 55' 46.06" N 82° 52' 33.70" E
Golamunda	41	Sinapali Sand Bed	Pabitra Mohan Sahu	Sinapalikalahandi	-	5.000	2016-17	2020-21		-	Working	Yes	20° 07' 24.64" N 82° 54' 00.61" E

NB: in the above table omitted Columns are,

Column 9&10 Period of Mining lease (1st/2nd...renewal)-NA

Column 13 Captive/ NonCaptive- All NonCaptive

Column 16 Method of Mining (Opencast/Underground)- All Open cast





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Mineral Potential (Table No. 11.A.02)

Boulder (MT)	Bajari (MT)	Sand (m ³) Geological Reserve	Total Mineable Mineral Potential (m ³)
NA	NA	3791946	2053783
Annual Deposition		3791946	2053783

(Table No. 11.A.03)

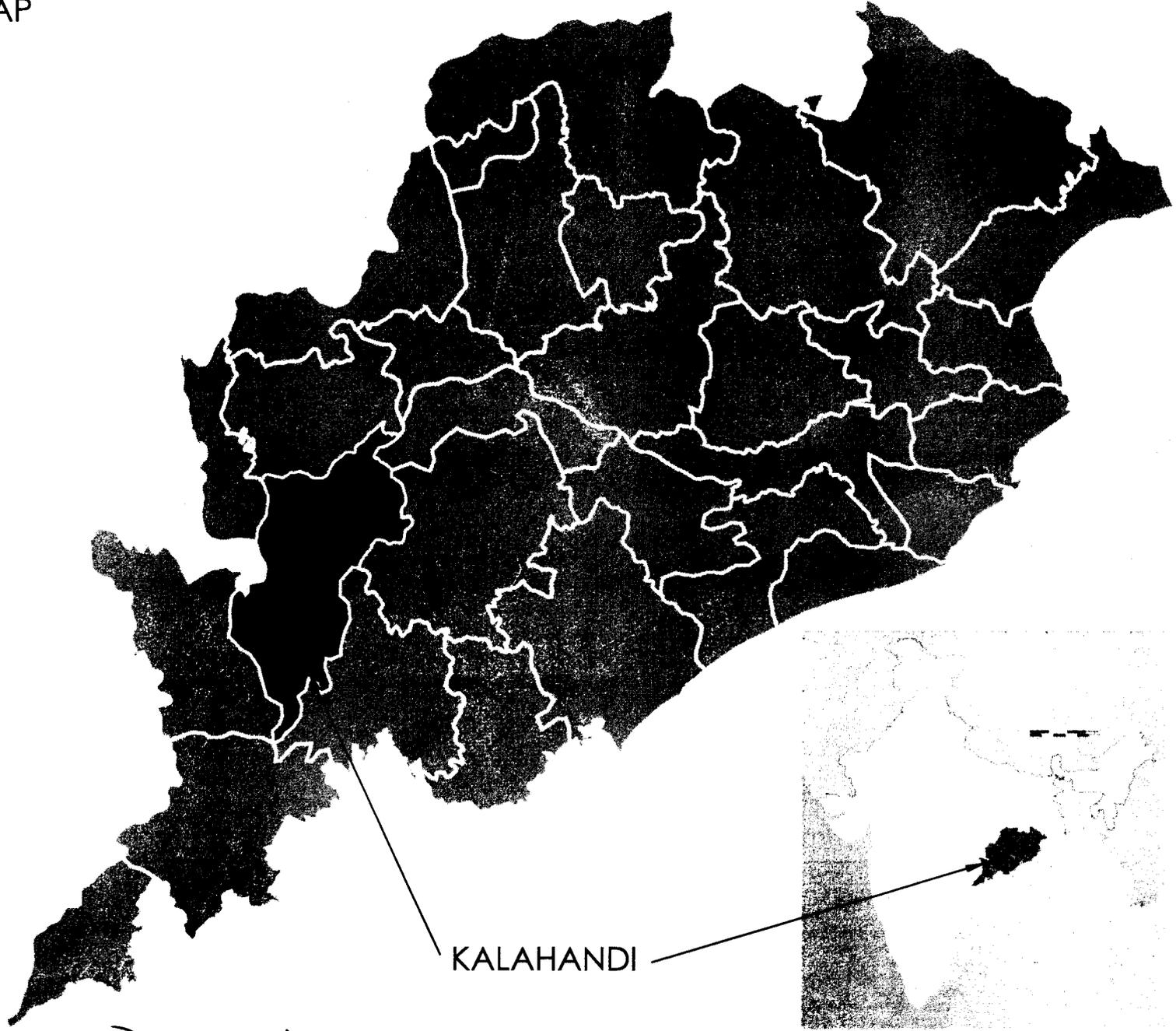
S. No.	River or Stream	Portion of the river or stream recommended for mineral concession	Length of area recommended for mineral concession (in kilometer)	Average width of area recommended for mineral concession (in meters)	Area recommended for mineral concession (in square meter)	Mineable mineral potential (in m ³) (60% of total mineral potential)
1	Tel River	Details provided in the Table No. 11.C.01 for each existing leases and for proposed leases details provided in the Resource table.				2053783
2	Hati River					
3	Udanti River					
4	Sagada River					
5	Kamsi River					
6	Ret River					
7	Uttei River					
Total for the District						2053783

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W

Additional District Magistrate
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KALAHANDI

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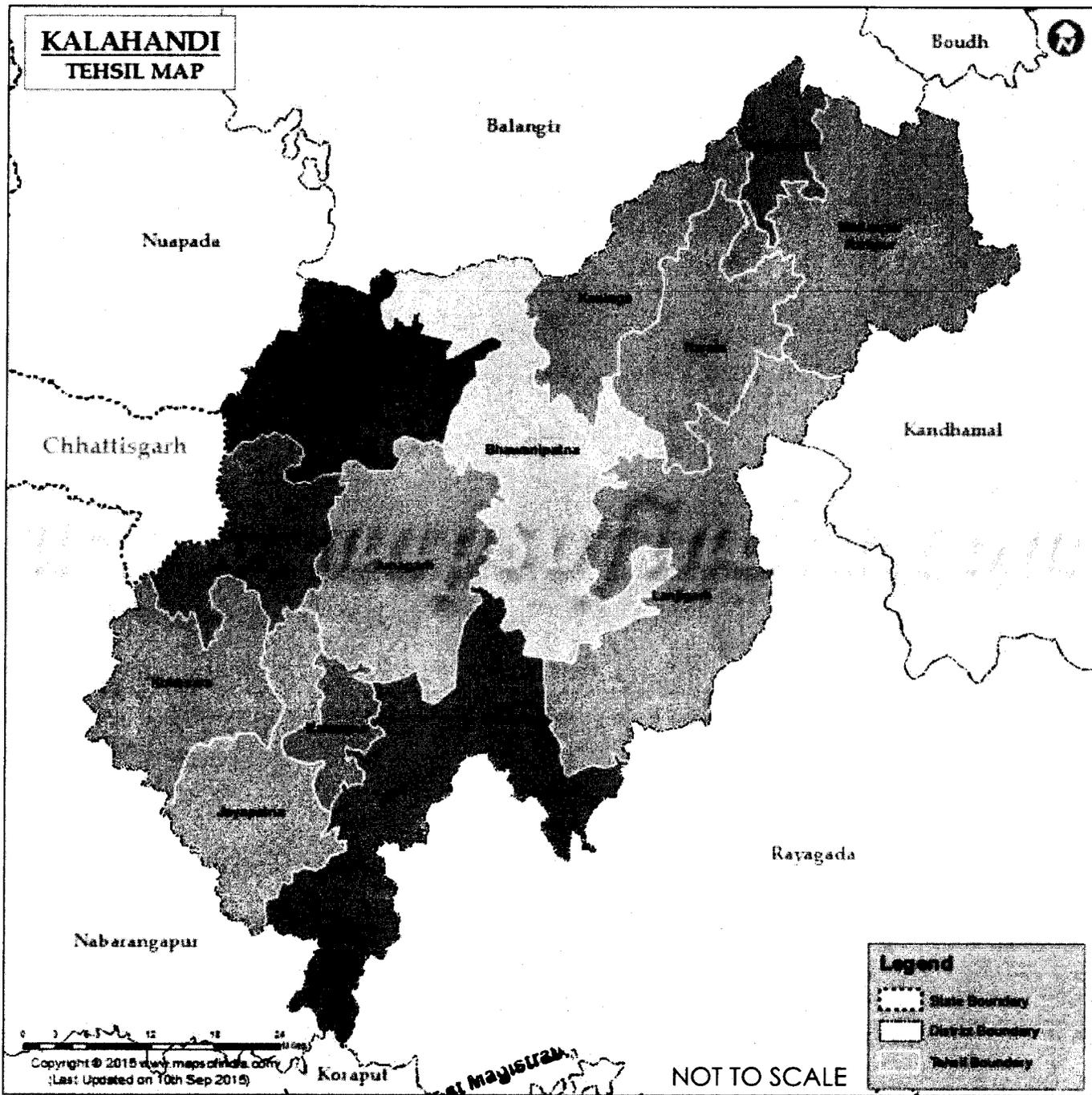
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NOT TO SCALE

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**KALAHANDI
TEHSIL MAP**



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(Last Updated on 10th Sep 2015)

Legend

- State Boundary
- District Boundary
- Tehsil Boundary

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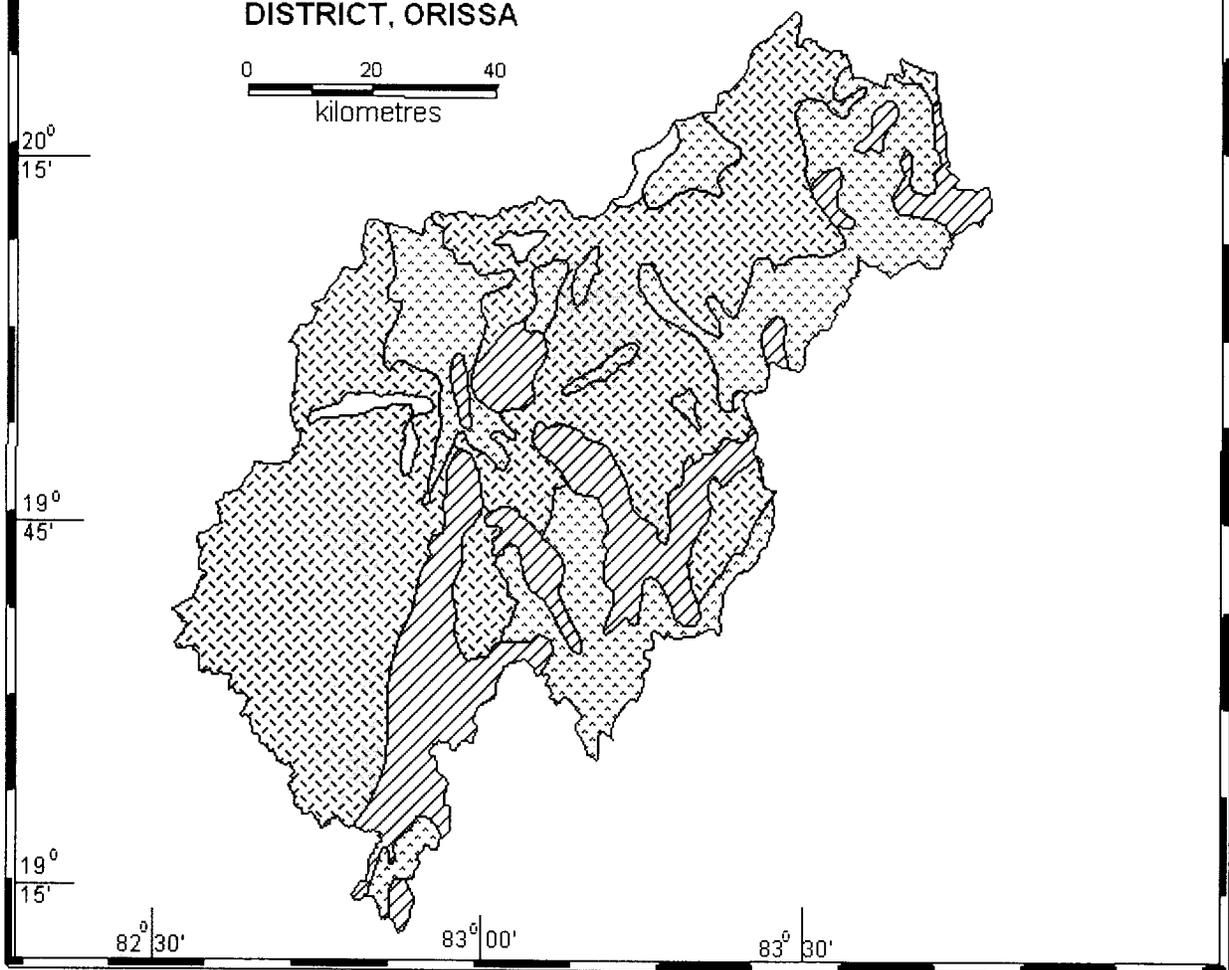
**Additional District Magistrate,
Kalahandi**

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HYDROGEOLOGICAL MAP OF KALAHANDI DISTRICT, ORISSA

Plate :- 5



LEGEND

	<u>AGE GROUP</u>	<u>LITHOLOGY</u>	<u>HYDROGEOLOGICAL CONDITIONS</u>	<u>GROUND WATER POTENTIAL</u>
UNCONSOLIDATED FORMATIONS	QUATERNARY	RECENT ALLUVIUM, LATERITES & LATERITIC GRAVELS	<div style="border: 1px solid black; width: 20px; height: 10px; display: inline-block;"></div> THIN DISCONTINUOUS PATCHES FORMING SHALLOW AQUIFERS	LIMITED TO MODERATE YIELD PROSPECTS BELOW 20m ³ /Hr.
	CONSOLIDATED FORMATIONS	ARCHEAN	GRANITE & ITS VARIANTS	<div style="background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px); width: 20px; height: 10px; display: inline-block;"></div> FISSURED FORMATION GROUND WATER RESTRICTED TO RESIDUUM AND FRACTURE ZONE HAVING SECONDARY POROSITY
CHARNOCKITES			<div style="background: repeating-linear-gradient(-45deg, transparent, transparent 2px, black 2px, black 4px); width: 20px; height: 10px; display: inline-block;"></div>	
KHONDALITES			<div style="background: radial-gradient(circle, black 1px, transparent 1px); background-size: 4px 4px; width: 20px; height: 10px; display: inline-block;"></div>	

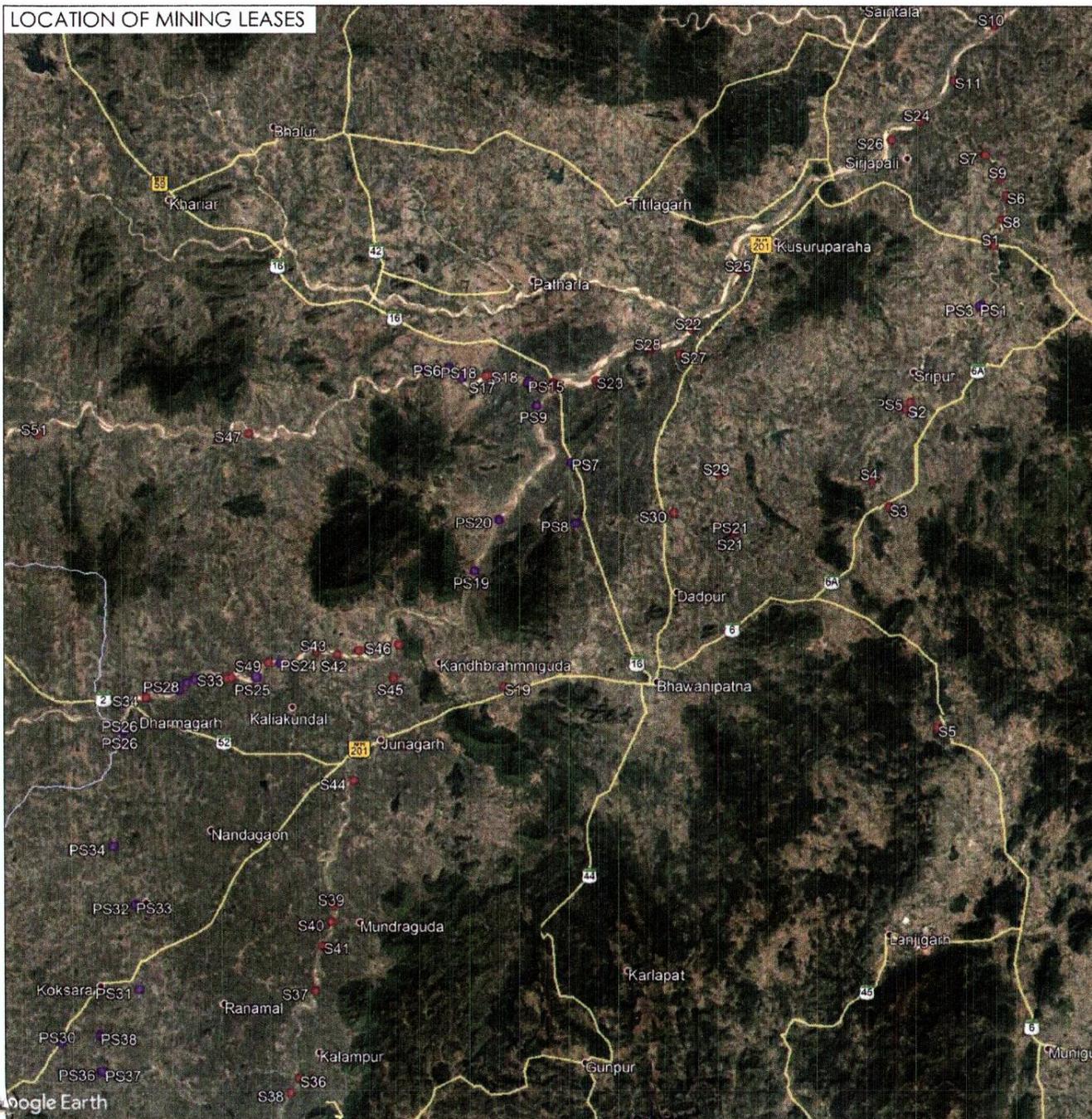
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ADDITIONAL DISTRICT COLLECTOR
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LOCATION OF MINING LEASES



20Km

PLATE-V

MAP SHOWING THE LEASES, ROADS, RIVERS ETC.

Index No.	Name of Tahasil	Name of Existing Source	Index No.	Name of Tahasil	Name of Proposed source
S1	M. Rampur	Turuchi Sand Bed	PS1	M. Rampur	Ghadapakhari Sand Bed
S2	Naria	Bhanpur Sand Bed	PS2	M. Rampur	Dam Karakhunta Sand Bed
S3	Naria	Sarguda Sand Bed	PS3	M. Rampur	Duta Sand Bed
S4	Naria	Bilat Sand Bed	PS4	M. Rampur	Ainigalli Sand Bed
S5	Naria	Lakhguda Sand Bed	PS5	Naria	Bhanpur-Bagpur Sand Bed
S6	Koramunda	Borpara Sand Bed	PS6	Kalahandi	Barda Sand Bed
S7	Koramunda	Daogaon Sand Bed	PS7	Kalahandi	Kali-pada Sand Bed
S8	Koramunda	Kemapala Sand Bed	PS8	Kalahandi	Pratlapada Sand Bed
S9	Koramunda	Khalapali Sand Bed	PS9	Kalahandi	Chahagaon Sand Bed
S10	Koramunda	Kundalipali Sand Bed	PS10	Kalahandi	Saguda Sand Bed
S11	Koramunda	Terasiga Sand Bed	PS11	Kalahandi	Kusumbar Sand Bed
S12	Koramunda	Poutkela Sand Bed	PS12	Kalahandi	Ganabara Sand Bed
S13	Koramunda	Pulligaon sand Bed	PS13	Kalahandi	Barda- 2 Sand Bed
S14	Koramunda	Legda Sand Bed	PS14	Kalahandi	Sapsal Sand Bed
S16	Kalahandi	Turkel Sand Bed	PS15	Kalahandi	Paikpada Sand Bed
S17	Kalahandi	Ajaral Sand Bed	PS16	Kalahandi	Pratlapada- 2 Sand Bed
S18	Kalahandi	Bargaon Sand Bed	PS17	Kalahandi	Barda Sand Bed
S19	Kalahandi	Gobra Sand Bed	PS18	Kalahandi	Antal Sand Bed
S20	Kalahandi	Sempur Sand Bed	PS19	Kalahandi	Blekuni Sand Bed
S21	Kalahandi	Jojana Nuada sand Bed	PS20	Kalahandi	Thema Sand Bed
S22	Kesinga	Feringa Sand Bed	PS21	Kalahandi	Jojana Nuada- 1 Sand Bed
S23	Kesinga	Chahagaon Sand Bed	PS22	Dharmagah	Chichila Sand Bed
S24	Kesinga	Beikhandi Sand Bed	PS23	Dharmagah	Chhilpa Sand Bed
S25	Kesinga	Kantesh Sand Bed	PS24	Dharmagah	Tambachhoda Sand Bed
S26	Kesinga	Digra Sand Bed	PS25	Dharmagah	Taligalari Sand Bed
S27	Kesinga	Joka sand Bed	PS26	Dharmagah	Sanchilikhari Sand Bed
S28	Kesinga	Pathala Sand Bed	PS27	Dharmagah	Kanchagaon Sand Bed
S29	Kesinga	Gakulewar Sand Bed	PS28	Dharmagah	Luhagaon Sand Bed
S30	Kesinga	Kanaka Sand Bed	PS29	Koksara	Kaucala Sand Bed
S31	Dharmagah	Brahmana sand Bed	PS30	Koksara	Kaucala Sand Bed
S32	Dharmagah	Kankeli Sand Bed	PS31	Koksara	Chilguda Sand Bed
S33	Dharmagah	Taranja Sand Bed	PS32	Koksara	Dahagaon sand Bed
S34	Dharmagah	Chhilpa Sand Bed	PS33	Koksara	Dahagaon sand Bed
S35	koksara	Mudra River Sand Bed	PS34	Koksara	Khurilla Sand Bed
S36	kalampur	Khangarguda River Sand Bed	PS35	Koksara	Ainly Sand Bed
S37	kalampur	Deypur River Sand Bed	PS36	Koksara	Ainly Sand Bed
S38	kalampur	Patrabasa River Sand Bed	PS37	Koksara	Ainly Sand Bed
S39	Junagarh	Habasur Sand Bed	PS38	Koksara	Sunamal Sand Bed
S40	Junagarh	Karchala Sand Bed			
S41	Junagarh	Dasigaon Sand Bed			
S42	Junagarh	Atigaon Sand Bed			
S43	Junagarh	Kanduguda Sand Bed			
S44	Junagarh	Budhipadar Sand Bed			
S45	Junagarh	Chingudisar Sand Bed			
S46	Junagarh	Pangoon Sand Bed			
S47	Golamunda	Udeshung Sand Bed			
S48	Golamunda	Chiligaon Sand Bed			
S49	Golamunda	Pandkul Sand Bed			
S50	Golamunda	Kumbhar Sand Bed			
S51	Golamunda	Sinapali sand Bed			

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Additional District map
Kalahandi.

Collector, Kalahandi