
PRE & POST MONSOON RIVER SAND REPLENISHMENT STUDY REPORT **For year 2021 (Brahmani River)**

(As Per Enforcement & Monitoring Guidelines for Sand 2020, MoEF)

(Use of **UAV/Drone & other image data
processing techniques adopted)**

of

Kenapali Sand Bed

(PLAN PERIOD – FIVE YEARS)

**Over 12.35 Acres/4.997 Hectares in Brahmani Nadi “KHA” village,
Under Lahunipara Tahasil of Sundargarh District, Odisha**

Applicant

Shree Rajashree Behera

W/o-Ranjit Kumar Das

At/Po- Panisalia, Dist- Jagatsinghpur

PREPARED BY

Zinu Sh. Sathua

RQP/OD/064/2016

Drone Acknowledgement No-D1D101974

Zeotek Mining Solutions

Plot No-A/3, Krishna Garden, Phase-II

Jagamara, Bhubaneswar-751030

Contact-9439553684

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Nov 2021


Zinu Sh. Sathua
RQP/OD/064/2016

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LIST OF ANNEXURE

DESCRIPTION	ANNEXURE NO.
Copy of letter from Tahasildar to applicant regarding Sand Replenishment Study Report.	I
Copy of Environment Clearance from SEIAA	II
Copy of RQP certificate	III

LIST OF PLATES

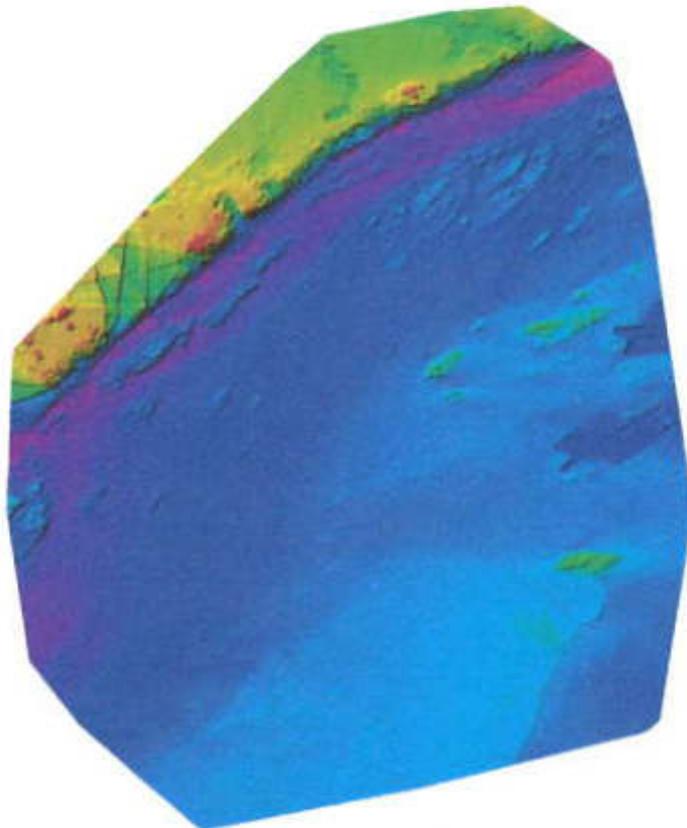
Plate No	Description	Scale (R F)
I	Key Plan	1 : 50,000
II	Lease plan	16" = 1 mile
III	Surface-Cum- Geological Plan As Per Approved Mining Plan	1 : 2,000
IV	Post-Monsoon Surface-Cum- Geological Plan	1 : 2,000
V	Post-Monsoon Real Time Geo referenced Aerial Photograph	1 : 1,000

Previews

Post - monsoon



Orthophoto



Digital Surface Model





0.0 INTRODUCTION

The sediment load of a river commonly is considered to be a pollutant that is aesthetically displeasing and environmentally degrading. Conversely, part of the sediment load (sand and gravel) may represent a natural resource for use by society. The potential usefulness of the sediment load is enhanced when it is composed of particle sizes found in deposits on the riverbed that would be replenished by newly transported sediment after mining. As such, river deposits become renewable resources, periodically replaced by sediment transport in the river. Regulatory environmental constraints, on-going mining of sand sources that are within economical travel distances of highways, increased public awareness of the value of such resources, and stringent engineering-quality standards for Sand are primary factors. Where available, renewable river deposits might provide local supplies of Sand.

This report quantifies the annual replenishment of Sand bed material in the **Brahmani River** after periods of sediment transport at high flows.

Kenapali Sand Bed over an area **11.76 Ac /4.767Ha** under reference is located in **Brahmaninadi** of village Brahmani Nadi "KHA" under Lahunipara Tahasil in Sundargarh district of Odisha. The Quarry lease has been granted by the Tahsildar, Lahunipara, to the successful bidder, **Shree Rajashree Behera, W/o- Ranjit Kumar Das, At- Panisalia, Dist- Jagatsinghpur**, of minor mineral **Kenapali Sand Bed** for **five years** as per OMMCR-2016. Existing Mining Plan has been approved and EC from SEIAA has been obtained for **MGQ 16375Cu.m** per annum. SEIAA has granted Environment Clearance with few stipulated conditions, which the applicant shall to comply time to time, hence as per the condition no 9.3 the competent authority has directed the applicant to carry out the pre & post monsoon sand replenishment study report and to get it submitted at SEIAA before **15TH November 2021** as stated by SEIAA.



Sand Replenishment Study 2021

The area under reference featured in the Survey of India Toposheet No. F45G16 and located between the latitude of 21°50'32.04"N to 21°50'41.18"N and longitude of 84°56'46.00"E to 84°56'54.49"E. The area is located at a distance of 150 Km from District headquarter of Sundargarh, and is at a distance of about 290 Km from the state capital Bhubaneswar.

The lease area has been surveyed Twice i.e. during Pre Monsoon & Post Monsoon by **UAV/Drone technique** as per the **Enforcement & Monitoring Guidelines for Sand 2020, MoEF**. After the field survey the multiple way point images got from the field are being processed in image processing software to generate point clouds to know the volume of deposit within the lease area, as per the approved Mining Plan co-ordinates.



**PRE MONSOON & POST MONSOON SAND REPLENISHMENT STUDY REPORT OF
RIVER SAND FROM BRAHMANI RIVER OF BRAHMANINADI 'KHA' VILLAGE
UNDER TUMKELA PANCHAYAT IN LAHUNIPADA TAHASIL OF SUNDARGARH
DISTRICT**

(Category: B2 as per EIA notification)

1. Name & Address of the lessee : Shree Rajashree Behera
W/o- Ranjit Kumar Das
At - Panisalia
Dist- Jagatsinghpur
2. Particulars of the area (Acreage, Boundary description & Land schedule):

• **Area coverage:**

The lease area comprises of 11.76 Acres/4.767 Hectares.

• **Boundary Description:**

Boundary co-ordinates as per the approved Mining Plan.

Table- 01 (Co-ordinates of lease boundary)

GPS Co-ordinates		
Pillar No.	Latitude	Longitude
P1	21° 50' 32.04"N	84° 56' 46.42"E
P2	21° 50' 37.79"N	84° 56' 46.00"E
P3	21° 50' 41.18"N	84° 56' 52.99"E
P4	21° 50' 32.30"N	84° 56' 54.49"E

- **Land Schedule:** As given by the competent authority:

Table- 02 (Land Schedule)

Village	Khata No	Plot No.	Area (In Acre)	Kisam
Brahmaninadi 'KHA'	01	41/P	12.35	Nadi

Adjoining village Kenapali.



Sand Replenishment Study 2021

3. Status of the Lessee: (Private Individual/ Private Company/ Public Sector/ Undertaking/ Joint Sector Undertaking/ Others) : Private individual
4. Period of concession : Five years
5. Mineral intended to be won : River sand
6. Name, address, registration no of RQP : Correspondence address
- Preparing the Report with validity
Of recognition : Zinu Shree Sathua
Zeotek Mining Solutions
Plot No-A/3, Krishna garden

Phase-II, Jagamara,

Bhubaneswar, Odisha-751030

Phone: +91-9439553684

E-Mail- zeotekmining@gmail.com

Registration No: RQP/OD/064/2016

Date of Grant : 03.08.2016

Valid Up to : 02.08.2026

7. Order no & date of competent authority : Letter No. 2231 & Dt-05.11.2021
- Instruction to carry out survey (Copy of the Tahasildar letter enclosed as **Annexure-I**)



8. REPLENISHMENT STUDY.

a. Generic Structure of Replenishment Study:

Initially replenishment study requires four surveys. The first survey needs to be carried out in the month of April for recording the level of mining lease before the monsoon (Reserves considered as per approved Mining plan). The second survey is at the time of closing of mines for monsoon season. This survey will provide the quantity of the material excavated before the offset of monsoon (**Drone/UAV** survey has been taken place for assessment of Reserve). The third survey needs to be carried out after the monsoon to know the quantum of material deposited/replenished in the mining lease(**Drone/UAV** survey has been taken place for assessment of Reserve). The fourth survey at the end of March to know the quantity of material excavated during the financial year. For the subsequent years, there will be a requirement of only three surveys. The results of year-wise surveys help the state government to establish the replenishment rate of the river. Based on the replenishment rate future auction may be planned.

The replenishment period may vary on nature of the channel and season of deposition arising due to variation in the flow. Such period and season may vary on the geographical and precipitation characteristic of the region and requires to be defined by the local agencies preferable with the help of the Central Water Commission and Indian Meteorological Department. The excavation will, therefore, be limited to estimated replenishment estimated with consideration of other regulatory provisions



Sand Replenishment Study 2021

b. Methodology for Replenishment Study:

Out of various methods suggested by the Enforcement & Monitoring Guidelines for Sand 2020 by MoEF, **UAV/Drone** survey method has been adopted for volumetric sand reserve assessment for the study.

Use of UAV/Drone and other image data processing techniques

With the development in image data processing tools and its accuracy acceptability, **Drone/UAV** fitted with the advance camera are used for survey purposes. Such technology has promising potential in the survey of sand mining zones due to its fast and reliable output deliveries. The survey is conducted using a set of instruments and compatible software to utilized the properly referenced data for depicting the topography of the study area. Instrument calibration and software compatibility and its validation with the ground data are an essential requirement for using this technique.

Geological & Mineable Reserve as per Approved Mining Plan

First reserve assessment has been considered from the approved Mining Plan.

Geological Reserve in Cu.M	Mineable Reserve in Cu.M
49970	43519

Geological & Mineable Reserve as per the Post-Monsoon UAV/Drone survey.

Post Monsoon survey by **UAV/Drone technique** as per the **Enforcement & Monitoring Guidelines for Sand 2020, MoEF**, on Dt:08.11.2021 (a real time georeferenced Orthoimage has been attached as plate no-VI for reference). After the field survey the multiple way point images got from the field are being processed in image processing software to generate point clouds to know the volume of deposit within the lease area, referring the approved Mining Plan co-ordinates.

Geological Reserve in Cu.M	Mineable Reserve in Cu.M
71733	63045



Sand Replenishment Study 2021

Comparison of Pre-Monsoon & Post-Monsoon Sand replacement rate within the Lease area:

In recent years, rapid development has led to an increased demand for river sand as a source of construction material. This has resulted in a mushrooming of river sand mining activities which have given rise to various problems that require urgent action by the authorities. These include river bank erosion, river bed degradation, river buffer zone encroachment and deterioration of river water quality. Very often, over-mining occurs which jeopardises the health of the river and the environment in general.

Assessment of reserve of above all periodical surveys are being done up to a depth up to **perennial water surface level**.

Reserve reference	Geological Reserve in Cu.M	Mineable Reserve in Cu.M
Approved Mining plan 2021	49970	43519
Post-Monsoon Drone Survey 2021	71733	63045

Geologically in nature it is never possible to predict the rate of sand replenishment for future but certainly from a long term systematic replenishment study we can establish an average rate of replenishment for a particular stage of river for a particular stretch given for lease.

Replenishment may vary naturally for Geological Reserve & Mineable Reserve, hence Rate of replenishment for Geological Reserve & Mineable Reserve has been assessed separately;



Sand Replenishment Study 2021

Rate of replenishment for Geological Reserve:-

Reserve as per Post-Monsoon Drone Survey 2021÷Reserve as per Approved Mining plan 2021= 143.5%)

$$71733\text{Cu.m} \div 49970\text{Cu.m} = 143.5\%$$

Rate of replenishment for Mineable Reserve:-

Reserve as per Post-Monsoon Drone Survey 2021÷Reserve as per Approved Mining plan 2021= 144.8%)

$$63045\text{Cu.m} \div 43519\text{Cu.m} = 144.8\%$$



9. Summary / Conclusion:

Summarised effects of sand and gravel mining as listed below:

- a) Extraction of bed material in excess of replenishment by transport from upstream causes the bed to lower (degrade) upstream and downstream of the site of removal.
- b) Bed degradation can undermine bridge supports, pipe lines or other structures.
- c) Degradation may change the morphology of the river bed, which constitutes one aspect of the aquatic habitat.
- d) Degradation can deplete the entire depth of gravelly bed material, exposing other substrates that may underlie the gravel, which could in turn affect the quality of aquatic habitat.
- e) If a floodplain aquifer drains to the stream, groundwater levels can be lowered as a result of bed degradation.
- f) Lowering of the water table can destroy riparian vegetation.
- g) Flooding is reduced as bed elevations and flood heights decrease, reducing hazard for human occupancy of floodplains and the possibility of damage to engineering works.
- h) The supply of overbank sediments to floodplains is reduced as flood heights decrease.
- i) Rapid bed degradation may induce bank collapse and erosion by increasing the heights of banks.
- j) In rivers in which sediments are accumulating on the bed (aggrading) in undisturbed condition, gravel extraction can slow or stop aggradation, thereby maintaining the channel's capacity to convey flood waters.
- k) The reduction in size or height of bars can cause adjacent banks to erode more rapidly or to stabilise, depending on the amount of sand and gravel removed, the distribution of removal, and on the geometry of the particular bend.
- l) Removal of gravel from bars may cause downstream bars to erode if they subsequently receive less bed material than is carried downstream from them by fluvial transport.



ତହସିଲଦାରଙ୍କ କାର୍ଯ୍ୟାଳୟ, ଲହୁଣୀପଡ଼ା

ଫୋନ୍: ୦୬୭୨୫-୨୩୨୧୦୪, ଇ-ମେଲ୍: (1) tah.lahuniod@nic.in (2) tah.lahuniod@gmail.com

ପତ୍ର ସଂଖ୍ୟା: ୨୨୩୧

ତା- ୦୫. 11. 2021

To

1. Shri K ushna Apat,
S/o- Gobardhan Apat,
Managing Director, Kapileswar Mining & Minerals Pvt. Ltd.
At-Po:Guali, Dist:Keonjhar.

2. Shree Rajashree Behera,
W/o-Ranjit Kumar Das,
At:Panisalia, Po/Ps- Jagatsinghpur,
Dist: Jagatsinghpur.

Sub: Submission of Pre-Monsoon and Post-Monsoon data for the leased-out sources i.e. Luthurba Sandbed & Kenapali Sandbed.

Sir,

With reference to the subject cited above I am to inform you that, as per the terms and conditions laid in the Environment Clearance issued by SEIAA, (as explained in the point No. 9.1) "the project proponent has to be carried out a study of the annual replenishment rate of sand by collecting Pre-monsoon & Post-monsoon data of the lease area by engaging an appropriate consultant. The finding of the study shall be submitted to SEIAA to assess the rate of replenishment of mined out sand in the lease area, Pending carrying out of the study & submission of the report, the clearance is being granted in an adhoc manner and is liable to be revoked after one year i.e. after 15th November, 2021 if satisfactory replenishment study report is not submitted.

Hence, you are directed to submit the above report immediately for taking further necessary action at this end. *within 10th Nov 2021.*

This is for your kind information and necessary action.

Yours faithfully,

Tahasildar, Lahunipara.

Memo No. 2232 Date. 05/11/2021

Copy forwarded to the Zinu Shree Sathua, Recognised Qualified Person, ZEOTEK MINING SOLUTIONS, (RQP/OD/064/2016), A/PoPs-Bonaigarh, Dist-Sundargarh for information.

Tahasildar, Lahunipara.



STATE LEVEL ENVIRONMENT IMPACT ASSESSMENT AUTHORITY,
ODISHA, BHUBANESWAR

LAHURU, ODISHA

Ref No: SEIAA/2019/2020 dated 15.07.2020

File No: SEIAA-2019-2020

15/7/20

The Tahasildar, Lahurpada,
Taluk-Lahurpada,
Dist-Sundergarh

Sub: Proposal for mining of sand from Karapada Sand pit over an area of 10.00 acres at 455714 at village, Saramprakhing, revenue Karapada village, Taluk-Lahurpada, District-Sundergarh of Tehsil-Lahurpada, Environmental Clearance No.

Ref: Proposal No. SEIAA-2019/2020 dated 15.07.2020

1. This is with reference to the application dated 15.07.2020 for grant of environmental clearance submitted in the office model for the proposed sand mining operations.

2. The application has been classified in the office model following it is a case of minor mineral extraction involving area of less than five (5) ha category project, and there is no provision of consent for filing EC application for such cases in the online mode. Since SEIAA in the PARNESH portal request applicant to submit Form-1 along with application on the basis of the said case when EC application is to be sent to SEIAA. The applicant has submitted the application in Form-1 in the Form-1, which provisions for minor mineral projects were being submitted upto the year 2010 under SEIAA. The Form-1 does not contain some of the essential information needed to determine a sensitivity, but most of the required information has been submitted by the applicant in the Checklist and also in the PFR. The State Govt vide their letter No. 21/2017/SE dated 25.11.2019 have requested the MPPSCC to make requisite provision in the PARNESH portal to facilitate filing of environmental clearance applications for minor mineral projects before SEIAA in the online mode, but so far the necessary provision has not been given in the said portal.

3. The application in Form-1 is supported by other necessary documents, namely the PFR, GSH, MMP, Approved Mining Plan and Checklist.

Signature

Created by user on Wednesday, 15 July 2020 10:00 AM. For more information, please contact the authority, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

4. The Tahasildar, Lathimpada who is the lease granting authority in this case is responsible for monitoring strict compliance by the project proponent with the following conditions of grant of allotment clearance:

5. The proposed activities in a nut shell are as follows:-

- a. (This is a proposal for mining of sand from Kanapali Sand Bed lying in the Brahmani River bed located at village- BrahmanisadrKha' adjoining Kanapali Village, Tahasil-Lathimpada, District Sundergarh, over lease area of 12.35 acres or 4.997Ha.
- b. The mine area is a part of the Survey of India Toposheet No. 745010 bounded by Latitudes $21^{\circ}50'32.04''N$ to $21^{\circ}50'41.16''N$ and Longitudes $84^{\circ}04'46.00''E$ to $84^{\circ}05'04.48''E$.
- c. The mining area is an identified sand source in the DSR. The Kanapali Sand Bed sand source will be leased out under the Odisha Rules, 2016 by Tahasildar Lathimpada for a lease period of 15 years.
- d. The mining plan of the mining project prepared on behalf of successful bidder (lessee) has been approved by Deputy Director of Mines Oris Deputy Director of Mines Kora Circle, Kora on 21.07.2020.
- e. As per the approved mining plan submitted, it is observed that the mineable reserve in the lease area is 43519 cum of sand, when extracted upto a depth of 1.0 m. No study of the annual rate of replenishment of sand has been done for the sand source which is a pre requisite as per the guidelines of sustainable sand mining management issued by the MoEF & CC, Govt. of India, and as per orders dated 12.12.2016 of the Hon'ble NGT.
- f. The project proponent has also not furnished the width of the river, nor the alignment of the extraction path for sand transportation. As reported by the tahasildar, a river bridge is at a distance of 4.8Km away from the mining lease area.
- g. The cluster certificate has been furnished by the Tahasildar certifying that there is no other mine located within 500 meters from the periphery of the proposed mine lease area. As reported by the Tahasildar, the sand source is not a part of any cluster.
- h. As per the approved mining plan, it is observed that sand from the quarry will be extracted manually upto a depth of 1.0 meter with annual extraction of sand not exceeding 16375 cum (maximum production capacity) during the valid lease period.

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Jitendra

6. The proposal conforms to the item no. 1(A) in the schedule of EIA Notification 2009 as amended time to time, and the river mineral extraction project falls under Category B2 as the mining lease area is less than 5 ha.

7. The proposal is duly assessed by the SEAC in its meeting held on 20.10.2020 and 05.11.2020. The SEAC has submitted the appraisal report and recommended for grant of EC vide their letter no. 6250SEAC/MSD-02 dated 10.11.2020.

8. The Environmental Clearance is accordingly granted in the proposed activity of sand mining / quarrying which shall take effect from the date of registration of duly executed lease deed in the regard by the Tahsildar and shall be contemporaneous with the expiry of lease period.

9. Stipulated Conditions

9.1 The project proponent has to carry out by engaging appropriate consultant a study of the annual replenishment rate of sand by collecting pre-monsoon & post monsoon data from the field to know the quantum of volume of sand deposited/depleted & extracted in the mining lease area. The detailed comparison of both pre-monsoon and post-monsoon elevation data shall be included in the study report. The replenishment rate of sand may be calculated by using the volumetric survey method or any other methods as laid down in Enforcement & Monitoring Guidelines for Sand Mining, 2020 issued by the MoEF & CC, Govt. of India. The finding of the study shall be submitted to SEIAA to assess the rate of replenishment of mined out sand in the lease area. Pending carrying out of the study & submission of the report, this clearance is being granted in an adhoc manner and is liable to be revoked after one year i.e. after 15th November, 2021 if satisfactory replenishment study report is not submitted.

9.2 In the first year i.e. before the rainy season of 2021 the extraction of sand shall not exceed 16375cum calculated by multiplying the working area in sqm by 1.0 meter depth of excavation.

9.3 There shall be a no mining zone to protect the embankment on both sides, road or rail bridge in the vicinity, if any, dam, weir, water intake structure of irrigation or drinking water project, or any cross drainage structure. 10% of the width of river shall be left intact along the embankments on both sides as no mining zone. Further no mining shall be allowed within 200 m of any of the above existing structures, and in case of River bridge, this no mining zone shall extend upto 100 meters from the bridge. The lease area shall be accordingly curtailed to leave out the actual sand mining area within the leasehold. Exact map of the lease area and the no mining zone shall be drawn to show, showing the GPS coordinates of all corner points, and the location of the bridge, embankment, irrigation canal & other structures, and such map has to be submitted to SEIAA by the project proponent through the Tahsildar within three months of the date of issue of the

- 9.3 The quantum of sand allowed to be extracted will be worked out on the basis of the actual working area.
- 9.4 The lease area and the actual working area shall be demarcated on the ground by existing durable (maximum 2000) pillars by the project proponent.
- 9.5 The project proponent shall take prior statutory and regulatory clearance as required from the concerned authorities in respect of the project, before carrying out any operation.
- 9.6 Mining is not permissible within the water channel or stream flow area. No stream shall be diverted for the purpose of mining and no natural water course shall be obstructed. The mining or any ancillary activity shall not in any way disturb the flow pattern of the river water during the non monsoon period. There shall be no sand mining in the river during the rainy season or when there is flow of water in the river. The operation of excavation is permitted shall be restricted shall be strictly as per the method laid down in the sanctioned mining plan. No excavation machine shall be allowed to be used by the project proponent for the extraction of sand from the listed area.
- 9.7 Any change in the plan, quantity to be produced, or method of mining shall require prior approval of DDA.
- 9.8 Sand mining operations shall not affect the existing sources for irrigation / drinking water / industrial purpose.
- 9.9 The natural wind courses, if any, near or surrounding the lease area shall not be disturbed.
- 9.10 No encroachment of the schedule shall in any way be allowed on any road passing through village/habitational/forest land, unless prior written permission of Transportation of minerals through existing rural roads can be allowed only by the concerned State Govt Department/District Panchayat and only after required strengthening, such that the carrying capacity of road is increased to handle the sand truck traffic. The project proponent shall bear the cost towards the widening and strengthening of existing public roads in case the same is proposed to be used for the project. No movement on any road is allowed on existing village road network without appropriately increasing the carrying capacity of such roads. Project proponent shall ensure that the road may not be damaged due to transportation of the mineral and transport of minerals will be as per IRC Guidelines with respect to carrying with traffic congestion and traffic safety. Plying of sand extraction trucks may be allowed on roads / path ways passing closer to schools, temples, hospitals and such other public places only with prior written permission of competent authority.
- 9.11 Vehicles used for transportation of sand from the site should be in good condition and should have pollution check certificate and should conform to appropriate air and noise emission standards and should be operated only during non-peak hours.
- 9.12 The vehicles shall not be overloaded and shall be covered with Tarpaulin. The Tarpaulin may subject an appropriate road maintenance levy from the lessee as part of the lease conditions on the basis of quantum of sand transported, and utilize the proceeds of the levy for proper maintenance of the extraction paths and roads to prevent their degradation on account of plying of sand trucks.

Signature

- 8.13 The project proponent shall take all precautionary measures against causing damage to flora and fauna of the locality. The PP shall plan and budget to for establishment a minimum of 100 number of saplings of native tree species along the approach roads, river banks and in community areas in consultation with the Gram Panchayat.
- 8.14 Water spray should be used on the road/track yards to control dust emission during Transportation of sand.
- 8.15 The Project Proponent shall undertake phased restoration, maintenance and rehabilitation of land affected by mining and complete the work before abandonment of mine.
- 8.16 Environmental Management Plan (EMP) shall be implemented by PP in strict compliance with the environmental conditions stipulated above. The year wise funds earmarked for environmental protection measures shall be kept in separate account and shall be spent according to the plan proposed. Year wise progress of implementation of EMP shall be reported to the SEIAA, Odisha and OSPCB along with the compliance report.
- 8.17 The proponent shall take necessary measures to ensure that there is no adverse impact of the mining operations on the human habitation if any, existing nearby.
- 8.18 It shall be mandatory for the project management to submit quarterly compliance reports on the status of implementation of the above stipulated environmental safeguards to the SEIAA, Odisha / SPCB, Odisha Regional Office at the MoEF, CC, Bhubaneswar in hard and soft copies on 15th of January, April, July, October of each calendar year falling which EC is liable to be renewed.
- 8.19 At the end of mine closure, the proponent shall immediately remove all the shed cut up in the quarry and all the equipment in the area before closure of the quarry.
- 8.20 The conditions stipulated in the environmental clearance will be closely monitored on the ground by the lease granting authority, i.e. the Tahsil Officer, who shall ensure that the project complies with all the stipulated conditions.
- 8.21 The concerned Regional Office of the MoEF & O/SPCB, Odisha shall periodically monitor compliance of the stipulated conditions as applicable for the project. The project authorities should extend full cooperation to the MoEF & O/SPCB officials by furnishing the requisite data / information / monitoring reports.
- 8.22 A copy of the clearance letter shall be sent by the proponent to concerned Gram Panchayat / Panchayat Samiti / Zila Parishad / Municipal Corporation / Urban Local Body as the case may be.
- 8.23 Project proponent shall obtain Consent to Operate from the OSPCB and effectively implement all the conditions stipulated therein. The mining activity shall not commence prior to obtaining Consent to Establish / Consent to Operate from the State Pollution Control Board.
- 8.24 The SEIAA, Odisha may revoke or suspend this EC, if implementation of any of the above conditions is not satisfactory. The SEIAA, Odisha reserves the right to alter / modify the above conditions or stipulate any further condition in the interest of environment protection.
- 8.25 The Project Proponent (lease holder) shall inform the SEIAA of any change in ownership of the mining lease. In case, there is any change in ownership or

Subant



GOVERNMENT OF ODISHA
DEPARTMENT OF STEEL AND MINES
DIRECTORATE OF MINES

CERTIFICATE OF RECOGNITION AS QUALIFIED PERSON
(Under sub-rule (2) of rule 20 of Odisha Minor Mineral Concession Rules, 2004)

Sri Zinudhree Sathua, S/o Sri Dibyasankar Sathua, At/P.O:
Bonaigarh, Dist: Sundargarh - 770038, whose photograph
and signature are affixed herein, having given satisfactory
evidence of his qualification and experience, is hereby
recognised under sub-rule (2) of rule 20 of Odisha Minor
Mineral Concession Rules, 2004 as a qualified person to
prepare Mining Plans for Minor Minerals within the State of
Odisha, India.



Zinudhree Sathua
31/08/16

His Registration No. is

RQP/OD/064 /2016

This Recognition is valid for a period of 10 years ending on 02.08.2026.
This certificate will be liable to be withdrawn/ cancelled in the event of furnishing
wrong information/ documents in the Mining Plans to be submitted by him.

Place: Bhubaneswar

Date: 03.08.2016

[Signature]
31/08/16
DIRECTOR OF MINES, ODISHA
BHUBANESWAR

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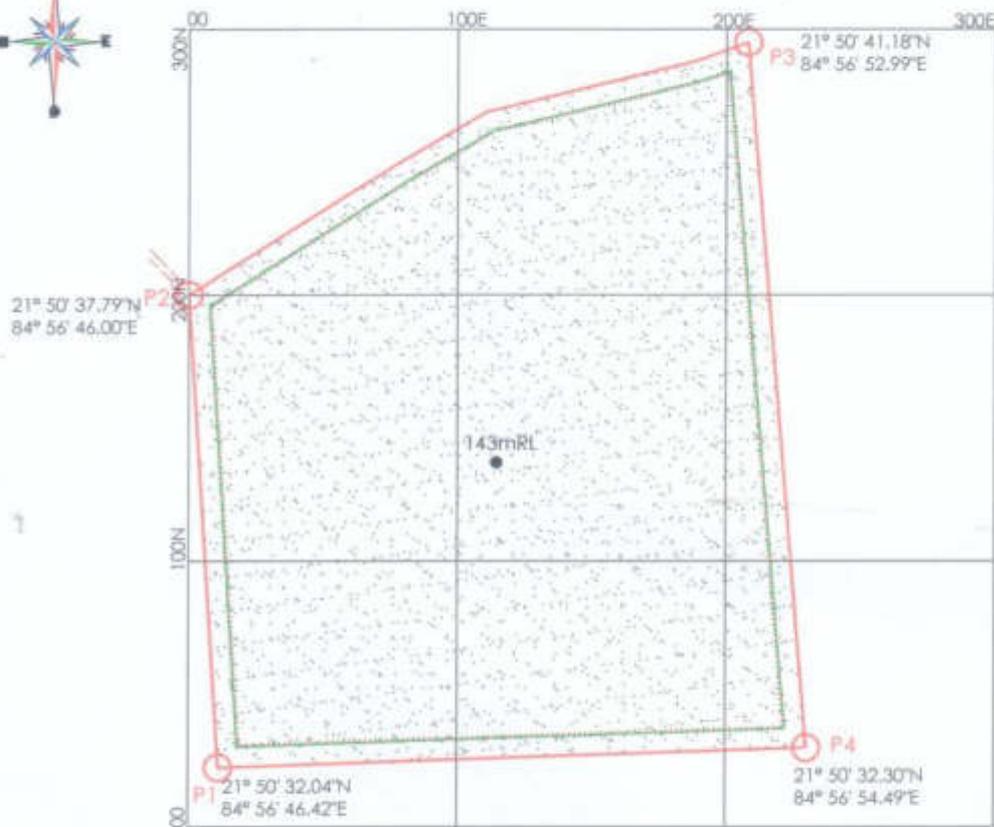
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Handwritten text in Kannada, possibly a date or reference.



Handwritten notes in Kannada at the bottom right, possibly providing details about the map or the project.



LEGEND

- QUARRY LEASE BOUNDARY
- SAFETY ZONE
- ACCESS ROAD
- 143mRL SPOT RL

GEOLOGICAL FEATURES

- ULTIMATE PIT LIMIT
- SAND



Plate No-III

KENAPALI SAND BED	
Over an area of 12.35Ac/4.997Ha. in Village Brahmaninadi "KHA" under Tahasil Lahuni para of Sondargarh District, Odisha	
Applicant - Shree Rajashree Behera	
SURFACE-GEOLOGICAL PLAN	
Scale - 1:2,000	Date of survey-15.05.2020
Certified that this plan is up to date & correct to the best of my knowledge.	
 Zinu Sathua RQP/00/064/2016	