Joint Inspection Report of the Committee

Submitted in Reference to

Hon'ble National Green Tribunal (NGT), Principal Bench,

order dated 03-02-2023 in the Matter of

Original Application No. 06/2023 (By V.C.)

Dinesh Bothra

Versus

Union of India & Others

Member of the committee

1. Shri Durga Prasad Meena, Sub- Divisional Officer, Nominee of District Collector, Tonk, District- Tonk (Raj.)
2. Dr. Anoop Chaturvedi, Scientist-"B", Regional Directorate, CPCB, Bhopal.
3. Shri Deepak Tanwar, EE & Regional Officer, RSPCB, Kishangarh (Nodal Officer).
4. Shri Manish Bansal, Executive Engineer, Construction Division-III, Bisalpur Project-Deoli, Nominee of Secretary, Irrigation, State of Rajasthan.

Joint Inspection Report of the Committee

In compliance of the Hon'ble National Green Tribunal (NGT) Central Zone Bench, Bhopal, order dated 03.02.2023, in the matter of Original Application No. 06/2023, Dinesh Bothra Versus Union of India & Others, the committee of following 04 members visited the site i.e. Bisalpur Dam, Tehsil- Deoli, District-Tonk on 28.02.2023 to record the factual situation and actions required to be taken:

1. Shri Durga Prasad Meena, Sub- Divisional Officer, Nominee of District Collector, Tonk, District- Tonk (Raj.)
2. Dr. Anoop Chaturvedi, Scientist-"B", Regional Directorate, CPCB, Bhopal.
3. Shri Deepak Tanwar, EE & Regional Officer, RSPCB, Kishangarh (Nodal Officer).
4. Shri Manish Bansal, Executive Engineer, Construction Division-III, Bisalpur Project-Deoli, Nominee of Secretary, Irrigation, State of Rajasthan.

As per the order of Hon'ble NGT, the committee verified the factual status on these following issues: -

1. Evaluation of the Scope of work defined on page number 73 of the Tender Document of M/s ERCPCL- Work principally as sand mining and worded as removal of silt/ sand/ gravel mixed overburden deposited in the submergence of Bisalpur Dam, District-Tonk, Rajasthan using mechanical dredgers.
2. Evaluation of the tender document of M/s ERCPCL, for removal of minor mineral from the Dam without preparing the DSR and classifying the same as work of desilting.
3. Comments on compliances of the guidelines of Sustainable Sand Mining Management Guidelines, 2016 & Enforcement & Monitoring Guidelines for Sand Mining, 2020.
4. Comments on non- compliance on the provisions of DSR.
5. Comments on substantial issue of environment.
6. Comments on Compliance of provisions of Rules, Regulations and Guidelines issued by MoEF &CC with respect to desilting of water reservoirs.

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Field Observations:-

1. Field visit of the site viz. Bisalpur Dam, was conducted by the aforementioned committee on dated 28.02.23, it was observed that no work of desilting has been initiated by M/s ERCPCL and any other agency till date.
2. No installation of machinery for desilting purpose has been done so far.
3. The scope of the work mentioned in the Bid document for Reclamation of storage capacity of Bisalpur Dam by Desilting was studied and it was found that the proposal is fully focused on the reclamation of storage capacity of the reservoir which has been decreased to 1029.94 MCum from its initial storage capacity when impounded in the year 2004 i.e. 1095.84MCum. (source- CWC Report dated Feb., 2022) [Annexure-1].
4. The Parliamentary Standing Committee on Water Resources vide letter dated 09.10.2015, directed all the Chief Secretaries of State Governments of India, that any desilting operation that is not undertaken with objective of winning a mineral, would not be a mining operation and would not therefore, require an issue of permit under the MMDR Act, 1957 [Annexure-2].

   Rajasthan State being Water Scarce State of India having Bisalpur Dam as a lifeline reservoir of drinking water for three Districts viz. Ajmer, Jaipur and Tonk and is in operations for the last 20 years, without any maintenance is losing its actual storage capacity leading to the loss of water due to overflow. Thus, a substantial loss of fresh water is occurring due to decreasing storage capacity of the reservoir.

   Due to the said loss of reservoir capacity, requirement of an additional reservoir in the downstream of Bisalpur Dam i.e. Isarda Dam has come in existence, which is under construction in the District Tonk, Rajasthan and the cost of which is more than 1000 crores. Further, to avoid any additional requirement of water reservoirs in downstream of the existing reservoirs and to mitigate the loss of fresh water due to overflows of run-offs, desilting of Bisalpur Dam would play a key role in conservation of natural resource, "Water".
5. MoEF & CC, GOI vide notification dated 15.01.2016 defines the requirement of preparation of District Survey Report (DSR) for sand mining or river bed mining and mining of other minor minerals [Annexure-3].

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However, the Parliamentary Standing Committee on Water Resources vide letter dated 09.10.2015, directed all the Chief Secretaries of State Governments of India, that any desilting operation that is not undertaken with objective of winning a mineral, would not be a mining operation and would not therefore, require an issue of permit under the MMDR Act, 1957.

Although, the existing DSR of Tonk District is valid up to 31.03.2023 and has not covered the submergence area of Bisalpur Dam as its scope of study. It is pertinent to mention that the submergence area of the reservoir has not been considered as mining lease area and therefore, has not been included in DSR of Tonk district [Annexure-4].

Since, the reclamation work of Bisalpur dam is not a mining activity, DSR may not be required.

6. Sustainable Sand Mining Management Guidelines, 2016 clearly states that Dredging and de-silting of dams, reservoirs, weirs, barrages, river and canals for the purpose of their maintenance, up keep and disaster management are exempted from being considered as Mining project/activity for the purpose of requirement of Environmental Clearance [Annexure-5].

   It has been mentioned in the Special Condition of the contract document that the contractor shall comply with all the prevailing Safety norms, Health and safety laws, Environmental laws, Labour laws, Fair Wages law and all other laws which are applicable for the execution of the work [Annexure-6].

7. The facts mentioned in point no.5 above, clearly reveals that the provisions of DSR are not applicable for the reclamation of storage capacity and desilting of water reservoir.

8. The project of dredging and desilting of dams, reservoirs, weirs, barrages, river and canals for the purpose of their maintenance, up keep and disaster management possess exemption from requirement of Environmental Clearance as Notified vide Gazette of India Dated 15.01.2016.

   The work of reclamation of storage capacity of reservoir shall utilize the machineries such as Dredgers, Hopper barges, Sand processing plant for desilting operations [Annexure-7]. The desilting operation shall not only increase the existing storage capacity of the reservoir but also preserve the overflowing of

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water through gates. The risk of flooding of the nearby areas may also be avoided thereof.

9. The project of dredging and desilting of dams, reservoirs, weirs, barrages, river and canals for the purpose of their maintenance, up keep and disaster management possess exemption from requirement of Environmental Clearance as Notified vide Gazette of India Dated 15.01.2016.

Conclusions:-

1. The work of reclamation of reservoir storage capacity is focused on conservation of water, meeting the drinking and irrigation purposes, which is utmost necessity for water scare state of Rajasthan. Since, no permit under MMDR, 1957 is required, so no query for DSR preparation should be considered.
2. All the conditions laid in special conditions of the bid documents regarding safeguarding the environment be strictly complied for by contractor under the supervision of ERCPCL.
3. The various provisions of Water (Prevention and Control of Pollution) Act, 1974 the Air (Prevention and Control of Pollution) Act, 1981 the Environment (Protection) Act, 1986 and its amendments shall be strictly complied by the bidder under the supervision of occupier of project i.e. ERCPCL. The half yearly compliances shall be submitted by ERCPCL to State PCB.

Recommendations:-

- Proper structural and Non-structural measures may be taken in upstream of reservoir so that future rate of siltation in the reservoir may be reduced.

Durga Prasad Meena,
Nominee of District
Collector, Tonk

Dr. Anoop Chaturvedi, Scientist "B"
Regional Directorate, CPCB,
Bhopal

Deepak Tanwar,
EE & Regional Officer,
RSPCB, Kishangarh,
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Manish Bansal,
Executive Engineer,
Construction Division III,
Bisalpur Project- Deoli, Tonk

EXECUTIVE SUMMARY

Water resources sector has got high priority in all our developmental plans and accordingly large number of dams has been constructed to produce electricity and water supply for domestic, irrigation & industrial purposes. Natural process like erosion in the catchments area and its deposition in various parts of reservoirs gradually reduce the capacity of reservoir. Dead as well as live storages are affected by it. Information about the reduction in capacity is necessary for all the planning and operational purpose and the same can be obtained through capacity surveys done at regular interval. The Hydrographic Survey Technique to calculate present capacity of reservoir is very useful due to its synoptic and repetitive coverage. The surveys based on Hydrographic & Topographic data are accurate, absolute as compared with other techniques. Central Water Commission has taken up the work of reassessing the capacity of existing reservoirs in the country and assessing amount of sedimentation occurred in these reservoirs post commissioning. The work related to 32 reservoirs, including Bisalpur reservoir, located in 5 states has been awarded to M/s Tojo Vikas International Private Limited (TVIPL) under the World Bank funded National Hydrology Project (NHP).

The main objectives of the surveys and studies are to estimate and study the sedimentation behaviour, conduct surveys (hydrographic & topographic), upgrade Area Elevation Capacity tables, assess life expectancy of reservoirs, recommend suitable measures for soil conservation, catchment area treatment, watershed details, develop contour map of reservoir beds, create database for developing regional sediment indices.

The Bisalpur reservoir has a catchment area of 27726 Sq.km. The area of the reservoir is 209.52 Sq.km. as per current survey of 2021. The estimated Original Gross Storage capacity of the reservoir at FRL 315.50 m was 1095.84 MCM at the time of first impoundment of reservoir in the year 2004. The Lives Storage Capacity of the reservoir at FRL 315.50 m elevation was assessed as 946.25 MCM at RS Survey in year 2009 and Gross Storage capacity 1029.94 MCM at current survey in year 2021.

While comparing Elevation Area Capacity curves of the year 2004 (pre impoundment), RS Survey in 2009 and the Hydrographic survey in 2021, it has been found the capacity of 2009 survey is less from current 2021 HS Survey. The possible reasons of reservoir in this reach might be following: -

- The result of remote sensing survey of 2009 may not be considered conclusive as the computations are based on limited no. of satellite images that too of a resolution of 23.5 m.
- In addition, there is a possibility that heavy sand mining might have taken place between MDDL and FRL.

The loss in reservoir capacity till 2021 was worked out 65.90 MCM in initial 17 years. The volume of sediment trapped during the past 17 years works out to 3.88 MCM/year or 1.40 Ha-m/100 Sq.km. /Year. Effective Annual Rate of Siltation during past 17 years works out to 0.14 mm/yr.

The reservoir is losing Gross Capacity at the rate of 0.35% per annum and the annual loss in Dead Storage Capacity and Live Storage Capacity works out to 2.17% and 0.25% respectively. The loss between 2004 and 2021 below MDDL (i.e., Dead Storage) works out to 32% of total loss. Thus, there is a significant loss of 68% in Live Storage.

As per the present studies, the Capacities below MDDL and Live Capacities expected to be available for next 100 years. It is clear from the above that there is no significant impact on the operation of the Irrigation Sluice from MDDL perspective.

Project authorities may adopt the revised elevation capacity table as obtained from 2021 survey for operation of the reservoir and for effective assessment of inflow and outflow discharges.

It is recommended to have a repeat hydrographic survey at an interval of 10 years, so that the results of two hydrographic surveys can be analysed for more reliable assessment of siltation rate in different zones of the Reservoir.

No.16/189/2014-M.VI
Government of India
Ministry of Mines

D No. 962855 /RS/WR/DIONB
Date. 23.10.15

New Delhi, Shastri Bhawan
Dated the 9th October, 2015

To

Chief Secretaries and Administrators of all State Governments/UT's

मुख्य सचिव कार्यालय
राजस्थान, जयपुर
प्राप्ति संख्या 962855/cs/
दिनांक 20/10/15

Subject: framing of rules under section 23C of the MMDR Act, 1957

Sir,

The Parliamentary Standing Committee on Water Resources in its meeting held on 29.4.2015 for examination of "Issues concerning flood management, compensation and status of ownership of submerged and eroded land in the country including compensation to farmers for loss of their crops destroyed by floods and right to disposal of the sand left in the fields of farmers" has, inter alia, deliberated on the issue of destruction of agricultural lands of farmers due to accumulation of silt during floods. In this regard, the Standing Committee has directed the State and Central Governments to work out a solution to provide maximum possible assistance to farmers in the post-flood scenario so as to enable the farmer to desilt the sand accumulated in their agricultural lands.

2. As per section 3(d) of the MMDR Act, 1957, "mining operations" means any operations undertaken for the purpose of winning any mineral. In the context of this definition, if desilting is undertaken per se with the objective of winning a mineral, it will be construed as a mining operation for which a mineral concession is required to be obtained from the State Government apart from other statutory permits / clearances like environment clearance etc. As a corollary any desilting operation that is not undertaken with the objective of winning a mineral it would not be a mining operation and would not, therefore, require the issue of a permit under the MMDR Act, 1957.

3. In order to give effect to the directions of the Standing Committee, farmers may be enabled to undertake desilting of the sand accumulated in their agricultural lands after recession of floods without the requirements of obtaining permits, clearances etc. considering the same as not falling within the ambit of "mining operations". Necessary instructions may be issued to give effect to the concerns of the Standing Committee in this regard.

Yours faithfully,

(Rokhum Lalremruata)
Director
Telefax No: 23388345
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P.T.O

EIA

रजिस्ट्री सं० डी० एल०-33004/99

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The Gazette of India

असाधारण

EXTRAORDINARY

भाग II—खण्ड 3—उप-खण्ड (ii)

PART II—Section 3—Sub-section (ii)

प्राधिकार से प्रकाशित

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पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय

अधिसूचना

नई दिल्ली, 15 जनवरी, 2016

का. आ. 141(अ).—एक प्ररूप अधिसूचना, पर्यावरण (संरक्षण) नियम, 1986 के नियम 5 के उपनियम (3) की अपेक्षानुसार अधिसूचना, सं. का.आ. 1533 (अ) तारीख 14 सितम्बर, 2006 में कतिपय और संशोधन करने के लिए सं. का.आ. 2588 (अ) तारीख 22 सितम्बर, 2014 द्वारा प्रकाशित की गई थी, उन सभी व्यक्तियों से जिनके उससे प्रभावित होने की संभावना है उक्त अधिसूचना के राजपत्र की प्रतियां जनता को उपलब्ध होने की तारीख से साठ दिन की अवधि के भीतर आक्षेप और सुझाव आमंत्रित किए गए थे;

और उक्त राजपत्र की प्रतियां जनता को 22 सितम्बर, 2015 को उपलब्ध करा दी गई थीं ;

और केन्द्रीय सरकार द्वारा पूर्वोक्त वर्णित प्रारूप अधिसूचना पर प्राप्त सुझावों या आक्षेपों पर सम्यक्त: विचार किया गया है ;

और दीपक कुमार आदि बनाम हरियाणा राज्य और अन्य आदि के मामले में माननीय उच्चतम न्यायालय के 2009 की विशेष अनुमति याचिका (सि) सं. 19628-19629 तारीख 27 फरवरी, 2012 में आई.ए.सं. 12-13, के आदेश के अनुसरण में खनन पट्टे के क्षेत्र पर विचार किए बिना लघु खनिजों के खनन के लिए पूर्व पर्यावरणीय अनापत्ति अब आज्ञापक हो गई है ;

और माननीय उच्चतम न्यायालय के पूर्वोक्त आदेश के अनुसरण में ऐसे मामले जिनके लिए पूर्व पर्यावरणीय अनापत्ति अभिप्राप्त करना अपेक्षित हो गया है, सारवान रूप से बढ़ गए है ;

और माननीय राष्ट्रीय हरित अधिकरण ने बालू खनन के मामले में 13 जनवरी, 2015 के अपने आदेश द्वारा समूह में लघु खननों के खनन पट्टे की पर्यावरणीय अनापत्ति के लिए नीति बनाने का निदेश दिया है ;

और राज्य सरकारों ने लघु खनिजों के खनन के लिए पर्यावरणीय अनापत्ति की प्रक्रिया को सुव्यवस्थित बनाने के लिए अभ्यावेदन दिए है ;

और पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय ने राज्य सरकारों के साथ परामर्श से भरणीय बालू खनन के लिए मार्गदर्शक सिद्धांत तैयार किए है जिसमें क्लस्टर के लिए पर्यावरणीय निकासी के उपबंधों, जिला

10 का.आ. 562(अ) तारीख 26 फ़रवरी 2014;

11. का.आ. 637(अ) तारीख 28 फ़रवरी 2014;

12. का.आ. 1599(अ) तारीख 25 जून 2014;

13. का.आ. 2601(अ) तारीख 7 अक्टूबर 2014;

14. का.आ. 2600(अ) तारीख 9 अक्टूबर 2014

15. का.आ. 3252(अ) तारीख 22 दिसम्बर 2014;

16. का.आ. 382(अ) तारीख 3 फरवरी, 2015;

17. का.आ. 811(अ) तारीख 23 मार्च, 2015;

18. का.आ. 996(अ) तारीख 10 अप्रैल 2015;

19. का.आ. 1142(अ) तारीख 17 अप्रैल 2015;

20. का.आ. 1141(अ) तारीख 29 अप्रैल 2015;

21. का.आ. 1834(अ) तारीख 6 जुलाई 2015;

MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

NOTIFICATION

New Delhi, the 15th January, 2016

S.O. 141(E).—Whereas in exercise of the powers conferred by sub-section (1) and clause (v) of sub-section (2) of section 3 of the Environment (Protection) Act, 1986 (29 of 1986), a draft notification for making certain amendments in the Environment Impact Assessment Notification, 2006, issued *vide* number S.O. 1533(E), dated the 14th September 2006, was published under sub-rule (3) of rule (5) of the Environment (Protection) Rules, 1986, vide number S.O. 2588(E), dated 22nd September, 2015, inviting objections and suggestions from all persons likely to be affected thereby, within a period of sixty days from the date of publication on which copies of Gazette containing the said notification were available to the public;

And whereas, copies of said notification were made available to the public on 22nd September 2015;

And whereas, all objections and suggestions received in response to the above mentioned draft notification have been duly considered by the Central Government;

And whereas, in pursuance to the order of Hon'ble Supreme Court dated the 27th February, 2012 in I.A. No.12-13 of 2011 in Special Leave Petition (C) No.19628-19629 of 2009, in the matter of Deepak Kumar etc. Vs. State of Haryana and Others etc., prior environmental clearance has now become mandatory for mining of minor minerals irrespective of the area of mining lease;

And whereas, as a result of the above said Order of Hon'ble Supreme Court, the number of cases which are now required to obtain prior environmental clearance has increased substantially;

And whereas, the Hon'ble National Green Tribunal, *vide* its order dated the 13th January, 2015 in the matter regarding sand mining has directed for making a policy on environmental clearance for mining leases in cluster for minor minerals;

And whereas, the State Governments have represented for streamlining the process of environmental clearance for mining of minor mineral;

And whereas, the Ministry of Environment, Forest and Climate Change in consultation with State Governments has prepared Guidelines on Sustainable Sand Mining detailing the provisions on environmental clearance for cluster, creation of District Environment Impact Assessment Authority and proper monitoring of sand mining using information technology and information technology enabled services to track the mined out material from source to destination;

Now, therefore, in exercise of the powers conferred by sub-section (1) and clause (v) of sub-section (2) of section 3 of the Environment (Protection) Act, 1986 read with clause (d) of sub-rule (3) of rule 5 of the Environment (Protection) Rules, 1986, the Central Government hereby makes the following amendments in the said notification, namely:-

In the said notification,-

(a) in paragraph 2, after the words "in the said Schedule", the following words shall be inserted, namely:-

"and at District level, the District Environment Impact Assessment Authority (DEIAA) for matters falling under Category 'B2' for mining of minor minerals in the said Schedule";

(b) after paragraph 3, the following paragraph shall be inserted, namely:-

"3 A. District Level Environment Impact Assessment Authority:-

(1) A District Level Environment Impact Assessment Authority hereinafter referred to as the DEIAA shall be constituted by the Central Government under sub-section (3) of section 3 of the Environment (Protection) Act, 1986 comprising of four members including a Chairperson and a Member-Secretary.

(2) The District Magistrate or District Collector shall be the Chairperson of the DEIAA.

(3) The Sub-Divisional Magistrate or Sub-Divisional Officer of the district head quarter of the concerned district of the State shall be the Member-Secretary of the DEIAA.

(4) The other two members of the DEIAA shall be the senior most Divisional Forest Officer and one expert. The expert shall be nominated by the Divisional Commissioner of the Division or Chief Conservator of Forest, as the case may be. The term and qualifications of the expert fulfilling the eligibility criteria are given in Appendix VII to this notification.

(5) The members of the DEIAA who are serving officers of the concerned State Government or the Union territory Administration shall be *ex-officio* members except the expert member.

(6) The District Level Expert Appraisal Committee hereinafter referred to as the DEAC shall comprise of eleven members, including a Chairman and a Member-Secretary.

(7) The senior most Executive Engineer, Irrigation Department in the district of respective State Governments or Union territory Administration shall be the Chairperson of the DEAC.

(8) The Assistant Director or Deputy Director of the Department of Mines and Geology or District Mines Officer or Geologist of the district shall be the Member-Secretary of the DEAC in that order.

(9) A representative of the State Pollution Control Board or Committee, senior most Sub-Divisional Officer (Forest) in the district, representative of Remote Sensing Department or Geology Department or State Ground Water Department, one occupational health expert or Medical Officer to be nominated by the District Magistrate or District Collector, Engineer from Zila Parishad, and three expert members to be nominated by the Divisional Commissioner or Chief Conservator of Forest, as the case may be, shall be the other members of the DEAC. The term and qualifications of the experts fulfilling the eligibility criteria are given in Appendix VII to this notification.

(10) The members of the DEAC who are serving officers of the concerned State Government or the Union territory Administration shall be *ex-officio* members except the expert members.

(11) The District Magistrate or District Collector shall notify an agency to act as Secretariat for the DEIAA and the DEAC and shall provide all financial and logistic support for their statutory functions.

(12) The DEIAA and DEAC shall exercise the powers and follow the procedure as specified in the said notification, as amended from time to time.

(13) The DEAC shall function on the principle of collective responsibility and the Chairman shall endeavor to reach a consensus in each case and if consensus cannot be reached, the view of the majority shall prevail. ";

(c) in paragraph 4, after sub-paragraph (iii), the following sub-paragraph shall be inserted, namely:-

"(iv) The 'B2' Category projects pertaining to mining of minor mineral of lease area less than or equal to five hectare shall require prior environmental clearance from DEIAA. The DEIAA shall base its decision on the recommendations of DEAC, as constituted for this notification." ;

(d) for paragraph 5, the following paragraph shall be substituted, namely:-

"5. Screening, Scoping and Appraisal Committees:-

The same Expert Appraisal Committees (EACs) at the Central Government, SEACs at the State or Union territory level and DEAC at the district level shall screen, scope and appraise projects or activity in category 'A', 'B1 and B2' and 'B2' projects for mining of minor minerals of lease area less than and equal to five hectare respectively. EAC, SEACs and DEACs shall meet at least once every month.

(a) The composition of the EAC shall be as given in Appendix VI. The SEAC at the State or the Union territory level shall be constituted by the Central Government in consultation with the concerned State Government or the Union

territory Administration with identical composition. DEAC at the district level shall be constituted by the Central Government as per the composition given in paragraph 3 A.

(b) The Central Government may with the prior concurrence of the concerned State Governments or the Union territory Administration constitute one SEAC for more than one State or Union territory for reasons of administrative convenience and cost.

(c) The EAC and SEAC shall be reconstituted after every three years.

(d) The authorised members of the EAC, SEACs and DEACs concerned, may inspect any site connected with the project or activity in respect of which the prior environmental clearance is sought for the purpose of screening or scoping or appraisal with prior notice of at least seven days to the project proponent who shall provide necessary facilities for the inspection.

(e) The EAC, SEACs and DEACs shall function on the principle of collective responsibility. The Chairperson shall endeavor to reach a consensus in each case and if consensus cannot be reached the view of the majority shall prevail.";

(e) for paragraph 6, the following paragraph shall be substituted, namely:-

"6. Application for Prior Environmental Clearance (EC):-

An application seeking prior environmental clearance in all cases shall be made by the project proponent in the prescribed Form 1 annexed herewith and Supplementary Form 1A, if applicable, as given in Appendix II after the identification of prospective site (s) for the project and/or activities to which the application relates; and in Form 1M for mining of minor minerals up to five hectare under Category 'B2' projects, as given in Appendix VIII, before commencing any construction activity, or preparation of land, or mining at the site by the project proponent. The project proponent shall furnish along with the application, a copy of the pre-feasibility project report, in addition to Form 1, Form 1A, and Form 1M; and in case of construction projects or activities (item 8 of the Schedule), a copy of the conceptual plan shall be provided instead of pre-feasibility report.";

(f) in paragraph 7,-

(i) in sub-paragraph (i), under the heading "I. Stage (1)- Screening:", the existing sub-paragraph shall be lettered as sub-paragraph "(A)" and after sub-paragraph as so lettered, the following sub-paragraph shall be inserted, namely:-

"(B) The cases as specified in Appendix IX shall be exempted from prior environmental clearance." ;

(ii) after sub-paragraph 7 (ii), the following sub-paragraph shall be inserted, namely:-

"7 (iii) Preparation of District Survey Report for Sand Mining or River Bed Mining and Mining of other Minor Minerals:

(a) The prescribed procedure for preparation of District Survey Report for sand mining or river bed mining and mining of other minor minerals is given in Appendix X.

(b) The prescribed procedure for environmental clearance for mining of minor minerals including cluster situation is given in Appendix XI.";

(g) in paragraph 8,-

(i) for the letters and word "EAC or SEAC", the words and letters "EAC or SEAC or DEAC" shall be substituted;

(ii) for the words "Expert Appraisal Committee or State Level Expert Appraisal Committee" wherever they occur, the words "Expert Appraisal Committee or State Level Expert Appraisal Committee or District Level Expert Appraisal Committee" shall be substituted;

(h) in paragraph 9, in sub-paragraph (i),-

for the words "Expert Appraisal Committee or State Level Expert Appraisal Committee", the words "Expert Appraisal Committee or State Level Expert Appraisal Committee or District Level Expert Appraisal Committee" shall be substituted;

(i) in paragraph 10, after sub-paragraph (iii), the following sub-paragraph shall be inserted, namely:-

"(iv) The prescribed procedure for sand mining or river bed mining and monitoring is given in Appendix XII.";

(j) in paragraph 11, -

for the words "Expert Appraisal Committee or State Level Expert Appraisal Committee", the words "Expert Appraisal Committee or State Level Expert Appraisal Committee or District Level Expert Appraisal Committee" shall be substituted;

(k) in the Schedule,-

(i) for item 1 (a) and the entries relating thereto, the following item and entries shall be substituted, namely:-

(1)	(2)	(3)	(4)	(5)
"1(a)	(i) Mining of minerals	≥50 ha of mining lease area in respect of non-coal mine lease >150 ha of mining lease area in respect of coal mine lease Asbestos mining	<50 ha of mining lease area in respect of non-coal mine lease ≤150 ha of mining lease area in respect of coal mine lease	General Conditions shall apply except: (i) for project or activity of mining of minor minerals of Category 'B2' (up to 25 ha of mining lease area); (ii) River bed mining projects on account of inter-state boundary.

		irrespective of mining area		**Note:** (1) Mineral prospecting is exempted. ''; (2) The prescribed procedure for environmental clearance for mining of minor minerals including cluster situation is given in Appendix XI."; (3) The mining leases which have obtained environmental clearance under Environment Impact Assessment Notification, 1994 and Environment Impact Assessment Notification, 2006 shall not require fresh environmental clearance during renewal provided the project has valid and subsisting environmental clearance.
	(ii) Slurry pipelines (coal lignite and other ores) passing through national parks or sanctuaries or coral reefs, ecologically sensitive areas.	All projects.		

(I) after Appendix VI, the following appendices shall be inserted, namely:-

"APPENDIX VII

(See paragraph 3 A)

Qualifications and terms for the Experts in DEIAA and DEAC

1. **Qualification:** The person should have at least (i) 5 years of formal University training in the concerned discipline leading to a MA or M Sc Degree or (ii) in case of Engineering/ Technology/ Architectural discipline, 4 years formal training course together with prescribed practical training in the field leading to a B. Tech/ B.E./ B. Arch. Degree, or (iii) Other professional degree (e.g. MBA etc.) involving a total of 5 years of formal University training and prescribed practical training, or (iv) Prescribed apprenticeship/ article ship and pass examinations conducted by the concerned professional associations (e.g. Chartered Accountancy) or (v) a University degree, followed by two years of formal training in a University or Service Academy (e.g. MBA/MPA etc.). In selecting the individual professionals, experience gained by them in their respective fields will be taken note of.
2. **Expert:** A professional fulfilling the above eligibility criteria with at least 10 years of relevant experience in the field or with an advanced degree (e.g. Ph. D) in a concerned field with at least 5 years of relevant experience.
3. **Age:** Below 70 years. However, in the event of non-availability of paucity of experts in a given field, the maximum age of a member may be allowed up to 75 years.
4. **Fields:** Experts in Mining, Geology, Hydrology, Remote Sensing, Environment Quality, Environment Impact Assessment Process, Risk Assessment, Life Sciences, Marine Sciences, Forestry and Wildlife, Environmental Economics, Bio-diversity, and River Ecology.

5. **Tenure:** The maximum tenure of expert members shall be for two terms of three years each.

6. The Expert Members may not be removed prior to expiry of the tenure without cause and proper enquiry.

APPENDIX VIII
(See paragraph 6)
FORM 1 M
APPLICATION FOR MINING OF MINOR MINERALS UNDER CATEGORY 'B2' FOR LESS THAN AND EQUAL TO FIVE HECTARE

(II) Basic Information

(viii) Name of the Mining Lease site:
(ix) Location / site (GPS Co-ordinates):
(x) Size of the Mining Lease (Hectare):
(xi) Capacity of Mining Lease (TPA):
(xii) Period of Mining Lease:
(xiii) Expected cost of the Project:
(xiv) Contact Information:

Environmental Sensitivity

Sl. No.	Areas	Distance in kilometer / Details
1.	Distance of project site from nearest rail or road bridge over the concerned River, Rivulet, Nallah etc.	
2.	Distance from infrastructural facilities Railway line National Highway State Highway Major District Road Any Other Road Electric transmission line pole or tower Canal or check dam or reservoirs or lake or ponds In-take for drinking water pump house Intake for Irrigation canal pumps	
3.	Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value	
4.	Areas which are important or sensitive for ecological reasons - Wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains, forests	
5.	Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration	
6.	Inland, coastal, marine or underground waters	
7.	State, National boundaries	
8.	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas	
9.	Defence installations	
10.	Densely populated or built-up area, distance from nearest human habitation	
11.	Areas occupied by sensitive man-made land uses (hospitals, schools, places of worship, community facilities)	
12.	Areas containing important, high quality or scarce resources (ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)	
13.	Areas already subjected to pollution or environmental damage. (those where existing legal environmental standards are exceeded)	
14.	Areas susceptible to natural hazard which could cause the project to present environmental problems (earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions)	

15.	Is proposed mining site located over or near fissure / fracture for ground water recharge	
16.	Whether the proposal involves approval or clearance under the following Regulations or Acts, namely:- (a) The Forest (Conservation) Act, 1980; (b) The Wildlife (Protection) Act, 1972; (c) The Coastal Regulation Zone Notification, 2011. If yes, details of the same and their status to be given.	
17.	Forest land involved (hectares)	
18.	Whether there is any litigation pending against the project and/or land in which the project is propose to be set up? (a) Name of the Court (b) Case No. (c) Orders or directions of the Court, if any, and its relevance with the proposed project.	

(Signature of Project Proponent
Along with name and address)

APPENDIX – IX

[See paragraph 7(i) (B)]

EXEMPTION OF CERTAIN CASES FROM REQUIREMENT OF ENVIRONMENTAL CLEARANCE

The following cases shall not require prior environmental clearance, namely:-

1. Extraction of ordinary clay or sand, manually, by the Kumhars (Potter) to prepare earthen pots, lamp, toys, etc. as per their customs.
2. Extraction of ordinary clay or sand, manually, by earthen tile makers who prepare earthen tiles.
3. Removal of sand deposits on agricultural field after flood by farmers.
4. Customary extraction of sand and ordinary earth from sources situated in Gram Panchayat for personal use or community work in village.
5. Community works like de-silting of village ponds or tanks, construction of village roads, ponds, bunds undertaken in Mahatama Gandhi National Rural Employment and Guarantee Schemes, other Government sponsored schemes, and community efforts.
6. Dredging and de-silting of dams, reservoirs, weirs, barrages, river, and canals for the purpose of their maintenance, upkeep and disaster management.
7. Traditional occupational work of sand by Vanjara and Oads in Gujarat *vide* notification number GU/90(16)/ MCR-2189(68)/5-CHH, dated the 14th February, 1990 of the Government of Gujarat.
8. Digging of well for irrigation or drinking water.
9. Digging of foundation for buildings not requiring prior environmental clearance.
10. Excavation of ordinary earth or clay for plugging of any breach caused in canal, nala, drain, water body, etc., to deal with any disaster or flood like situation upon orders of District Collector or District Magistrate.
11. Activities declared by State Government under legislations or rules as non-mining activity with concurrence of the Ministry of Environment, Forest and Climate Change, Government of India.

APPENDIX - X

[See paragraph 7 (iii) (a)]

PROCEDURE FOR PREPARATION OF DISTRICT SURVEY REPORT

The main objective of the preparation of District Survey Report (as per the Sustainable Sand Mining Guideline) is to ensure the following:

Identification of areas of aggradations or deposition where mining can be allowed; and identification of areas of erosion and proximity to infrastructural structures and installations where mining should be prohibited and calculation of annual rate of replenishment and allowing time for replenishment after mining in that area.

The report shall have the following structure:

1. Introduction
2. Overview of Mining Activity in the District
3. The List of Mining Leases in the District with location, area and period of validity
4. Details of Royalty or Revenue received in last three years
5. Detail of Production of Sand or Bajari or minor mineral in last three years
6. Process of Deposition of Sediments in the rivers of the District
7. General Profile of the District
8. Land Utilization Pattern in the district: Forest, Agriculture, Horticulture, Mining etc.

9. Physiography of the District
10. Rainfall: month-wise
11. Geology and Mineral Wealth

In addition to the above, the report shall contain the following:

(a) District wise detail of river or stream and other sand source.
(b) District wise availability of sand or gravel or aggregate resources.
(c) District wise detail of existing mining leases of sand and aggregates.

A survey shall be carried out by the DEIAA with the assistance of Geology Department or Irrigation Department or Forest Department or Public Works Department or Ground Water Boards or Remote Sensing Department or Mining Department etc. in the district.

Drainage system with description of main rivers

S. No.	Name of the River	Area drained (Sq. Km)	% Area drained in the District

Salient Features of Important Rivers and Streams:

S. No.	Name of the River or Stream	Total Length in the District (in Km)	Place of origin	Altitude at Origin

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 metric tonne) (60% of total mineral potential)

Mineral Potential

Boulder (MT)	Bajari (MT)	Sand (MT)	Total Mineable Mineral Potential (MT)

Annual Deposition

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 metric tonne) (60% of total mineral potential)
Total for the District						

A Sub-Divisional Committee comprising of Sub-Divisional Magistrate, Officers from Irrigation department, State Pollution Control Board or Committee, Forest department, Geology or mining officer shall visit each site for which environmental clearance has been applied for and make recommendation on suitability of site for mining or prohibition thereof.

Methodology adopted for calculation of Mineral Potential:

The mineral potential is calculated based on field investigation and geology of the catchment area of the river or streams. As per the site conditions and location, depth of minable mineral is defined. The area for removal of the mineral in a river or stream can be decided depending on geo-morphology and other factors, it can be 50 % to 60 % of the area of a particular river or stream. For example in some hill States mineral constituents like boulders, river born Bajri, sand up

to a depth of one meter are considered as resource mineral. Other constituents like clay and silt are excluded as waste while calculating the mineral potential of particular river or stream.

The District Survey Report shall be prepared for each minor mineral in the district separately and its draft shall be placed in the public domain by keeping its copy in Collectorate and posting it on district's website for twenty one days. The comments received shall be considered and if found fit, shall be incorporated in the final Report to be finalised within six months by the DEIAA.

The District Survey Report shall form the basis for application for environmental clearance, preparation of reports and appraisal of projects. The Report shall be updated once every five years.

APPENDIX - XI

[See paragraph 7 (iii) (b)]

PROCEDURE FOR ENVIRONMENTAL CLEARANCE FOR MINING OF MINOR MINERALS INCLUDING CLUSTER

The following policy shall be followed for environmental clearance of mining of minor minerals including cluster situation:-

(1). The data provided by the States (Sustainable Sand Mining Guidelines) shows that most of the mining leases for minor minerals are of lease area less than 5 hectare. It is also reported that in hill States getting a stretch in river with area more than 5 hectare is very uncommon. So the size of lease for minor minerals including river sand mining will be determined by the States as per their circumstances.

(2). The mining of minor minerals is mostly in clusters. The Environment Impact Assessment or Environment Management Plan are required to be prepared for the entire cluster in order to capture all the possible externalities. These reports shall capture carrying capacity of the cluster, transportation and related issues, replenishment and recharge issues, geo-hydrological study of the cluster area. The Environment Impact Assessment or Environment Management Plan shall be prepared by the State or State nominated Agency or group of project proponents in the Cluster or the project proponent in the cluster.

(3). There shall be one public consultation for entire cluster after which the final Environment Impact Assessment or Environment Management Plan report for the cluster shall be prepared.

(4). Environmental clearance shall be applied for and issued to the individual project proponent. The individual lease holders in cluster can use the same Environment Impact Assessment or Environment Management Plan for application for environmental clearance. The cluster Environment Impact Assessment or Environment Management Plan shall be updated as per need keeping in view any significant change.

(5). The details of cluster Environment Impact Assessment or Environment Management Plan shall be reflected in each environmental clearance in that cluster and DEAC, SEAC, and EAC shall ensure that the mitigative measures emanating from the Environment Impact Assessment or Environment Management Plan study are fully reflected as environmental clearance conditions in the environmental clearance's of individual project proponents in that cluster.

(6). A cluster shall be formed when the distance between the peripheries of one lease is less than 500 meters from the periphery of other lease in a homogeneous mineral area.

(7). Form 1M, Pre-Feasibility Report and mine plan for Category 'B2' projects for mining of minor minerals shall be prepared by the Registered Qualified Person or Accredited Consultants of Quality Council of India, National Accreditation Board for Education and Training. The Environment Impact Assessment or Environment Management Plan for Category 'A' and Category 'B1' projects shall be prepared by the accredited consultants of Quality Council of India, National Accreditation Board for Education and Training.

(8). The SEIAAs shall have supervisory jurisdiction over the DEIAAs and decisions of DEIAA shall be reviewed by the SEIAA without prejudice to any provisions under any existing law.

Schematic Presentation of Requirements on Environmental Clearance of Minor Minerals including cluster situation

Area of Lease (Hectare)	Category of Project	Require-ment of EIA / EMP	Require-ment of Public Hearing	Require-ment of EC	Who can prepare EIA/ EMP	Who will apply for EC	Authority to appraise/ grant EC	Authority to monitor EC compliance
EC Proposal of Sand Mining and other Minor Mineral Mining on the basis of individual mine lease								
0 – 5ha	**'B2'**	Form –1M, PFR and Approved Mine Plan	No	Yes	Project Proponent	Project Proponent	DEAC/ DEIAA	DEIAA SEIAA SPCB CPCB MoEFCC Agency

> 5 ha and < 25 ha	**'B2'**	Form –I, PFR and Approved Mine Plan and EMP	No	Yes	Project Proponent	Project Proponent	SEAC / SEIAA	nominated by MoEFCC
≥ 25ha and < 50ha	**'B1'**	Yes	Yes	Yes	Project Proponent	Project Proponent	SEAC/ SEIAA	
≥ 50 ha	**'A'**	Yes	Yes	Yes	Project Proponent	Project Proponent	EAC/ MoEFCC	
EC Proposal of Sand Mining and other Minor Mineral Mining in cluster situation								
Cluster area of mine leases up to 5 ha	**'B2'**	Form –1M, PFR and Approved Mine Plan	No	Yes	State, State Agency, Group of Project Proponents, Project Proponent	Project Proponent	DEAC/ DEIAA/	DEIAA SEIAA SPCB CPCB MoEFCC Agency nominated by MoEFCC
Cluster area of Mine leases > 5 ha and < 25 ha with no individual lease > 5 ha	**'B2'**	Form –I, PFR and Approved Mine Plan and one EMP for all leases in the Cluster	No	Yes	State, State Agency, Group of Project Proponents, Project Proponent	Project Proponent	DEAC/ DEIAA/	
Cluster of mine leases of area ≥ 25 hectares with individual lease size < 50ha	**'B1'**	Yes	Yes	Yes	State, State Agency, Group of Project Proponents, Project Proponent	Project Proponent	SEAC/ SEIAA	
Cluster of any size with any of the individual lease ≥ 50ha	**'A'**	Yes	Yes	Yes	State, State Agency, Group of Project Proponents, Project Proponent	Project Proponent	EAC/ MoEFCC	

APPENDIX - XII

[See paragraph 10 (iv)]

PROCEDURE FOR MONITORING OF SAND MINING OR RIVER BED MINING

1. The security feature of Transport Permit shall be as under:

   (a) Printed on Indian Banks' Association (IBA) approved Magnetic Ink Character Recognition (MICR) Code paper.

   (b) Unique Barcode.

   (c) Unique Quick Response (QR) code.

   (d) Fugitive Ink Background.

   (e) Invisible Ink Mark.

   (f) Void Pantograph.

   (g) Watermark.

2. Requirement at Mine Lease Site:

   (a) Small Size Plot (Up to 5 hectare): Android Based Smart Phone.

(b) Large Size Plots (More than 5 hectare): CCTV camera, Personal Computer (PC), Internet Connection, Power Back up.

(c) Access control of mine lease site.

(d) Arrangement for weight or approximation of weight of mined out mineral on basis of volume of the trailer of vehicle used.

3. Scanning of Transport Permit or Receipt and Uploading on Server:

(a) Website: Scanning of receipt on mining site can be done through barcode scanner and computer using the software;

(b) Android Application: Scanning on mining site can be done using Android Application using smart phone. It will require internet availability on SIM card;

(c) SMS: Transport Permit or Receipt shall be uploaded on server even by sending SMS through mobile. Once Transport Permit or Receipt get uploaded, an unique invoice code gets generated with its validity period.

4. Proposed working of the system:

The State Mining Department should print the Transport Permit or Receipt with security features enumerated at Paragraph 1 above and issue them to the mine lease holder through the District Collector. Once these Transport Permits or Receipts are issued, they would be uploaded on the server against that mine lease area. Each receipt should be preferably with pre-fixed quantity, so the total quantity gets determined for the receipts issued.

When the Transport Permit or Receipt barcode gets scanned and invoice is generated, that particular barcode gets used and its validity time is recorded on the server. So all the details of transporting of mined out material can be captured on the server and the Transport Permit or Receipt cannot be reused.

5. Checking On Route:

The staff deployed for the purpose of checking of vehicles carrying mined mineral should be in a position to check the validity of Transport Permit or Receipt by scanning them using website, Android Application and SMS.

6. Breakdown of Vehicle:

In case the Vehicle breakdown, the validity of Transport Permit or Receipt shall be extended by sending SMS by driver in specific format to report breakdown of vehicle. The server will register this information and register the breakdown. The State can also establish a call centre, which can register breakdowns of such vehicles and extend the validity period. The subsequent restart of the vehicle also should be similarly reported to the server or call centre.

7. Tracking of Vehicles:

The route of vehicle from source to destination can be tracked through the system using check points, RFID Tags, and GPS tracking.

8. Alerts or Report Generation and Action Review:

The system will enable the authorities to develop periodic report on different parameters like daily lifting report, vehicle log or history, lifting against allocation, and total lifting. The system can be used to generate auto mails or SMS. This will enable the District Collector or District Magistrate to get all the relevant details and shall enable the authority to block the scanning facility of any site found to be indulged in irregularity. Whenever any authority intercepts any vehicle transporting illegal sand, it shall get registered on the server and shall be mandatory for the officer to fill in the report on action taken. Every intercepted vehicle shall be tracked.

The monitoring of mined out mineral, environmental clearance conditions and enforcement of Environment Management Plan will be ensured by the DEIAA, SEIAA and the State Pollution Control Board or Committee. The monitoring arrangements envisaged above shall be put in place not later than three months. The monitoring of enforcement of environmental clearance conditions shall be done by the Central Pollution Control Board, Ministry of Environment, Forest and Climate Change and the agency nominated by the Ministry for the purpose.".

[No. Z-11013/98/2014-IA-II (M)]

MANOJ KUMAR SINGH, Jt. Secy.

Note: The principal rules were published in the Gazette of India, Extraordinary, Part II, Section 3, Sub-section (ii) *vide* number S.O. 1533 (E), dated the 14th September, 2006 and subsequently amended *vide* the following numbers :-

1. S.O. 1737 (E) dated the 11th October, 2007;
2. S.O. 3067 (E) dated the 1st December, 2009;
3. S.O. 695 (E) dated the 4th April, 2011;
4. S.O. 2896 (E) dated the 13th December, 2012;
5. S.O. 674 (E) dated the 13th March, 2013;
6. S.O. 2204 (E) dated the 19th July 2013;
7. S.O. 2555 (E) dated the 21st August, 2013;
8. S.O. 2559 (E) dated the 22nd August, 2013;
9. S.O. 2731 (E) dated the 9th September, 2013;
10. S.O. 562 (E) dated the 26th February, 2014;
11. S.O. 637 (E) dated the 28th February, 2014;
12. S.O. 1599 (E) dated the 25th June, 2014;
13. S.O. 2601 (E) dated the 7th October, 2014;
14. S.O. 2600 (E) dated the 9th October, 2014
15. S.O. 3252 (E) dated the 22nd December, 2014;
16. S.O. 382 (E) dated the 3rd. February, 2015;
17. S.O. 811 (E) dated the 23rd March, 2015;
18. S.O. 996 (E) dated the 10th April, 2015;
19. S.O. 1142 (E) dated the 17th April, 2015;
20. S.O. 1141 (E) dated the 29th April, 2015;
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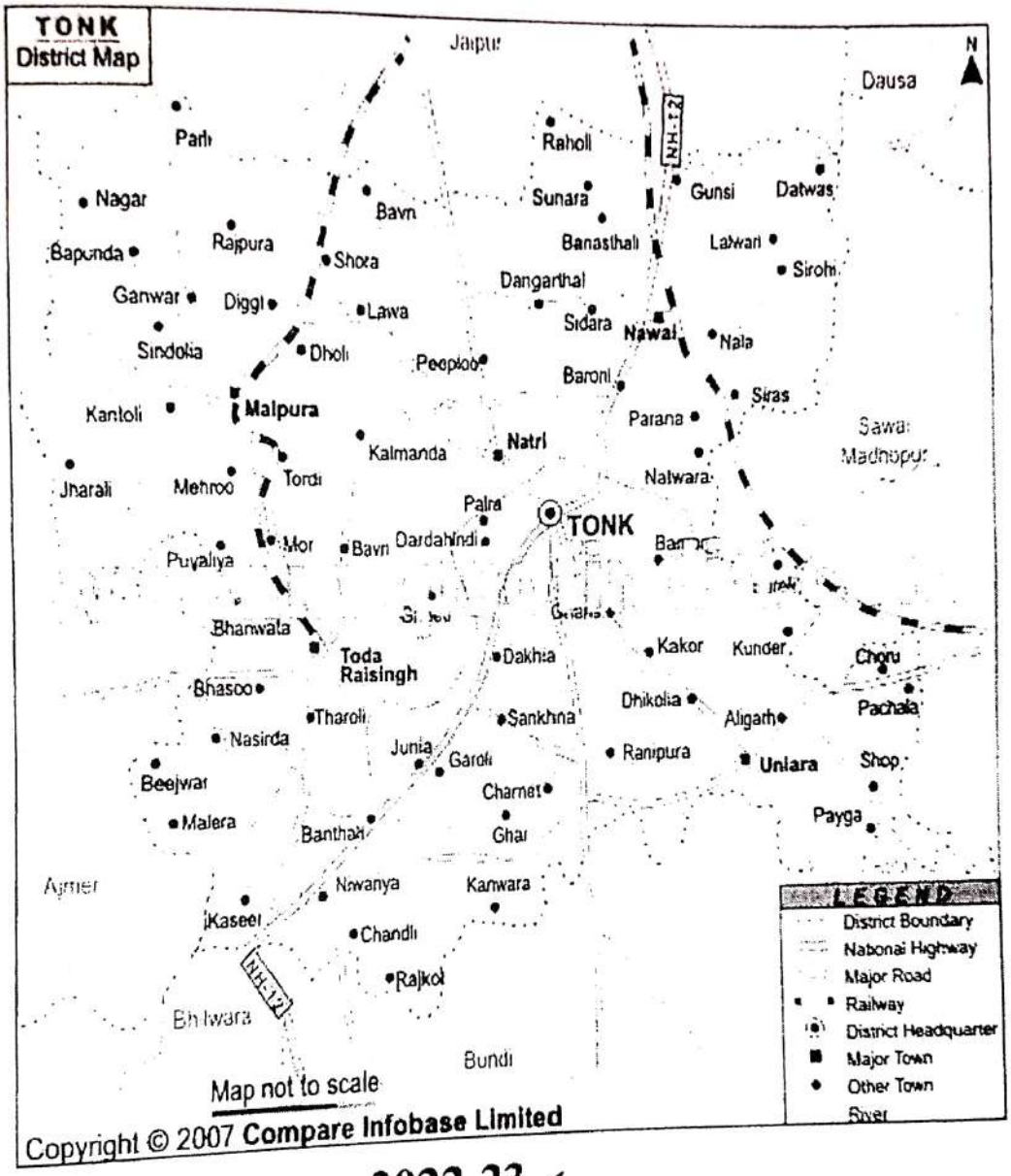
DISTRICT SURVEY REPORT OF TONK DISTRICT (RAJASTHAN)



2022-23

As Per Gazette Notification (Extraordinary) No. So 2827 Wednesday, July-25 2018 Of Ministry Of Environment, Forest And Climate Change, Govt. Of India(MOEF&CC) Guidelines 2016 & 2020

DEPARTMENT OF MINES AND GEOLOGY

RAJASTHAN

वरिष्ठ भू वैज्ञानिक
खान एवं भू विज्ञान विभाग

सहायक खनि अभियन्ता
भू-विज्ञान विभाग
[राज.]

DISTRICT SURVEY REPORT, TONK

(Under Ministry of Environment, Forest & Climate Change, New Delhi, Notification Date 25-07-2018)

PREFACE

Ministry of Environment, Forest and Climate Change (MOEFCC) had time to time made provisions for obtaining environmental clearance, such as, wide Environmental Impact Notification, SO 1533 (E), dated 14th September 2006, made mandatory to obtain environmental clearance for different kinds of development projects as listed in Schedule-1.

Further, Hon'ble Supreme Court wide order dated the 27th February, 2012 in I.A. No.12- 13 of 2011 in Special Leave Petition (C) No.19628-19629 of 2009, in the matter of Deepak Kumar etc. Vs. State of Haryana and Others etc., ordered that "*leases of minor minerals including their renewal for an area of less than five hectares be granted by the States/Union Territories only after getting environmental clearance from MoEF.*"; And Hon'ble National Green Tribunal, order dated the 13th January, 2015 in the matter regarding sand mining has directed for making a policy on environmental clearance for mining leases in cluster for minor Minerals,

The MoEF&CC in compliance of above Hon'ble Supreme Court's and NGT'S order has prepared "Sustainable sand Mining Guidelines, 2016" in consultation with State governments, detailing the provisions on environmental clearance (EC) for cluster, creation of District Environment Impact Assessment Authority, preparation of District survey report and proper monitoring of minor mineral. There by issued Notification dated 15.01.2016 for making certain amendments in the EIA Notification, 2006, and made mandatory to obtain EC for all minor minerals. Provisions have been made for the preparation of **District survey report (DSR)** of River bed mining and other minor minerals.

Every effort has been made to cover all matter/issues mentioned in the notification for district survey report for Tonk district. The main objective of the preparation of DSR (as per the Sustainable Sand Mining Guideline) is to ensure the following -

1. Identification of areas of aggradations or deposition where mining can be allowed;
2. Identification of areas of erosion and proximity to infrastructural structures and installations where mining should be prohibited and calculation of annual rate of replenishment and allowing time for replenishment after mining in that area.
3. Identification of mineral wealth in the district.

The DEIAA and DEAC will scrutinize and recommend for EC of mining of minor minerals on the basis of DSR. This will a model and guiding doccument which is a compendium of available mineral resources, geographical set up, environmental and ecological set up of the district and replenishment of minerals and is based on data of various departments, published reports, journals and websites.

The minerals found in the district are Lime stone, Granite, Soapstone, Dolomite, schist, Quartz, Feldspar, Silica sand, bajri etc.

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सहायक खान अभियन्ता
खान एवं भू-विज्ञान विभाग

District Survey Report (DSR) of Tonk District

Need of DSR:-As per Gazette notification of 15th January 2016 of MOEF & CC a survey shall be carried out by the District Environment Impact Assessment Authority (DEIAA) with assistance of irrigation department, Forest department, Mining department, Ground Water Boards, Remote Sensing Department and Revenue department in the district at regular interval to for preparation of District Survey Report as per the sustainable Sand mining guidelines, 2016& 2020 to ensure identification of areas of aggradations or deposition where mining can be allowed; and identification of areas of erosion and proximity to infrastructural structures and installations where mining should be prohibited and calculation of annual rate of replenishment and allowing time for replenishment after mining in that area.

As per notification it is essential to prepare a survey document mapping the status of sand sources and other minerals in a district. This survey should be conducted and report be prepared for each district. Though it is an acceptable fact that rivers cut across districts and States and every river is an ecosystem in itself. But, keeping in view the fact that the district is the most established unit of administration at which this kind of survey, planning and monitoring can be ensured effectively. So, every district will prepare this document taking the river stretch in that district as an ecological unit and inventorying other sources of sand in the district.

The natural resources must be utilized in environment friendly manner in scientific and systematic way and with the objective of sustainable development the policy on the subject should have provisions for protection of environment & ecology. These factors can be accounted for in a most efficient manner at district level. The sustainable mining plan needs to be dynamic.

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सहायक खनि अभियन्ता
खान एवं भू-विज्ञान विभाग
टोंक [राज.]

वरिष्ठ भू वैज्ञानिक
खान एवं भू विज्ञान विभाग
अजमेर

DISTRICT SURVEY REPORT, TONK

(Under Ministry of Environment, Forest & Climate Change, New Delhi, Notification Date 25-07-2018)

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सहायक खनि अभियन्ता
खान एवं भू-विज्ञान विभाग

वैज्ञानिक
खान एवं भू-विज्ञान विभाग

CHAPTER -1
INTRODUCTION

1.1 INTRODUCTION:

Tonk is a town in the Indian state of Rajasthan. The town is situated 95 km by road south from Jaipur, near the right bank of the Banas River. It is the administrative headquarter of Tonk District. Tonk was also the capital of the eponymous princely state of British India from 1817 to 1947.During the regime of Nawabs, the natives were invited to an Islamic function of Milad-un-nabi without regard to caste, color or creed. It was organized by the ruling Nawabs for a period of seven days in the month of Rabi al-awwal.The founding ruler of Tonk was Nawab Muhammad Amir Khan (1769-1834). Tonk was known as Samwad Lakshya in the Mahabharat period. In The Mauryan regime, it was under the Mouryas and then it was merged into Malvas. Most of the period was under Harsh Vardhan. According to Hevan Sang, visitor to China, it was under Bairath State. In the regime of the Rajputs, this state was under Chavras, Solankis, Kachvahs, Sisodiyas and Chouhans. Later, it was under the regime of King Holkar and Sindhia.

In 1806, Amir Khan conquered it, taking it from Balvant Rao Holkar. The British government captured it in turn. Under the treaty of 1817, the British government returned it to Amir Khan. Tonk was founded in 1818 by an Afghan military leader who was granted land by the ruler of Indore.

Over a millennia, this quiet little township became a town in the hands of numerous rulers. Modern Tonk was infact, founded by Nawab Ameer Khan as a result of a treaty with the British in 1818. Nawab Saddat Ali Khan, his descendent, went to renovate and initiate massive development in Tonk.

In Rajasthani Language, a high pointed hill towards sky is known as 'Took". As this town developed at the foothill of Rasia Ki Pahari (high hill) previously known as "Tookda", best in times became Tonk. Beside this some believe, name of Tonk derived from Sanskrit word Tokra (pointed hill).

1.2 LOCATION AND EXTENT:

The District Tonk is situated on National Highway No. 12 at distance of 100 kms from Jaipur. It is located between longitudes 75°07' to 76°19' and latitude 25°41' to 26°34'. It is bounded in the north by Jaipur district, in the east by Swai Madhopur district and in the west by the Ajmer district. The total geographical area of Tonk district is 7.16 lacs hectares, but for land utilization purpose the area is reported to be 7.19 lacs hectares in 2002-03 as per land record papers. Tonk district occupies 20th position among the existing 33 districts of the state; so far its area is concerned. The total area of the District is 7194 sq kms.

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Figure 1.0: Location Map

1.3BRIEF HISTORY OF THE DISTRICT:-

1. Sunehri Kothi: It was constructed in 1824 by Nawab Ameer Khan and later renovated by Nawab Ibrahim Ali Khan; this small and simple structure is a poem of embellishment within. Inlay work in mirrors, colored glass, gilded stucco, mosaic and lapis lazuli, pointed and polished floors reflected in the fabulous stained glass windows, leave the visitor quite bedazzled with all this super craft manships.

2. Arabic & Persian Research Institute : Connoisseurs of art and culture, the Nawabs of Tonk have contributed a rare and valuable collection of Persian and Arabic

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books and manuscripts of great antiquity, to the cultural heritage of Rajasthan. This institute was originally called "The Saidiya Kutub Khan".

3. Jama Masjid : Located in the heart of the bustling city is the "Jama Masjid" , a place of active worship stub. The Masque is embellished with some beautiful Indo-Persian motifs.

4. Rasia Ki Chhatri : Common morating the ancient legend of rasia and Annapurna, this delightful Chhatri (cenataps) stands a top a hill overlooking the main road. Situated across from it, on another hill, is the Annapurna temple.

5. Kakod Fort : Headout to Sway Madhopur and make a stopover at Kakod fort which is 22 km. away. It was once the official residence of the Rao Raja of Uniara.

6. Uniara : The Uniara Places commands an excellent view of assorted palaces, temples and stone carvings from its vantage positions. Uniara was a Jagir of East while Jaipur state and its Thakur were given the title of Rao Raja.

7. Hathi Bhata : En route to Sway Madhopur, just 10 km. away from Kakod, is Hathi Bhata, a huge life sage stone elephant. Inscribed also on this rock is the stroky of Raja Nal and Damyani. Other Places of Interest :-Diggi Shri Kalyan(73 km.) & Bisalpur Dam.

1.4ADMINISTRATIVE SET UP:-

Tonk district is located in north–eastern part of the state bordering jaipur in the north, Sawai Madhpur in the east, Bundi & Bhilwara in the South & Ajmer District in the west. Tonk is a Erstwhile Nawabi state before partition of India. Some worth visiting places in and around Tonk are Sunehari kothi, Hathi Bhatta, Jama Masjid & Bisalpur Dam, traditional Kunda called Baodi in Toda Raisingh town.

S. No.	Name of Sub Division	Name of Tehsil
1.	Tonk	Tonk
2.	Deoli	Deoli
3.	Newai	Newai
4.	Uniyara	Uniyara, Nagar Fort
5.	Malapura	Malapura
6.	Todaraisingh	Todaraisingh, Dooni
7.	Piploo	Piploo

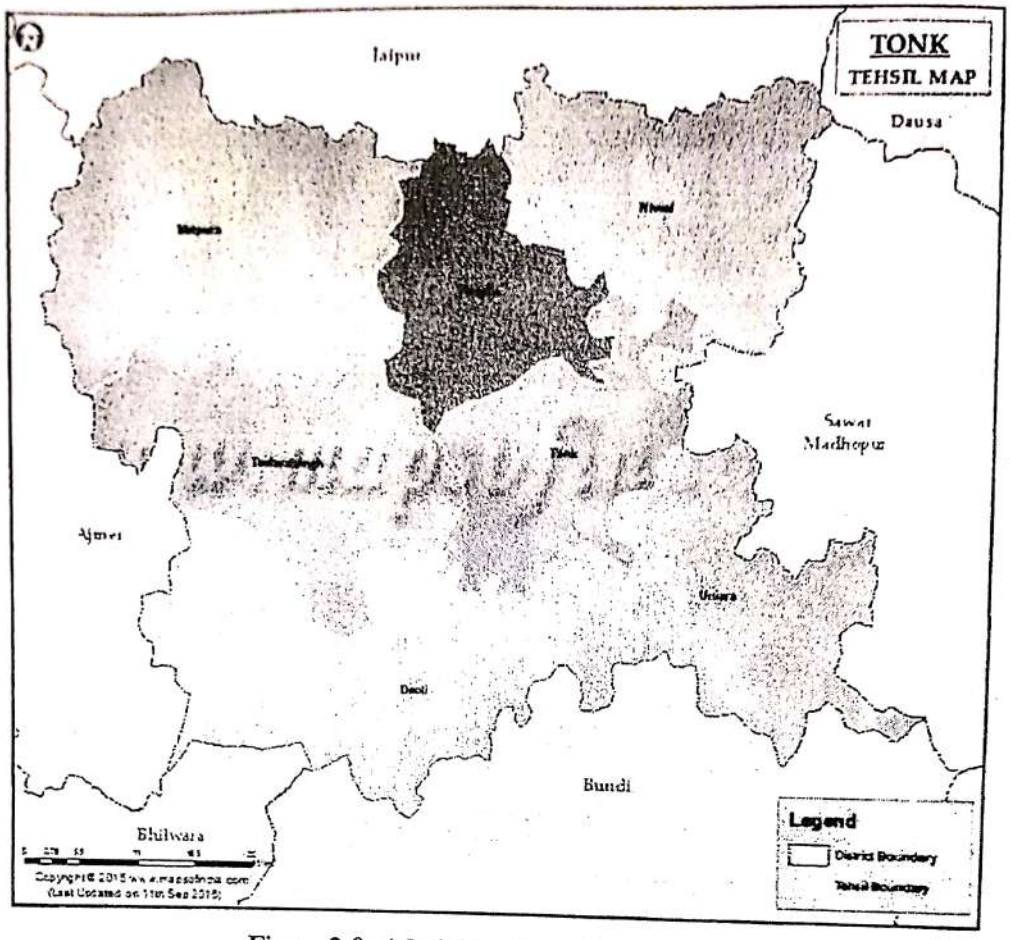

Figure 2.0: Administrative set up

1.5CLIMATE AND RAINFALL:

The climate is generally dry except in the short South-west monsoon season, which starts from about the third Week of June and continues till the middle of September, From mid September to November is the post Monsoon Season; between December and February is winter. In March, summer commences and extends till June.

About the middle of November both day and night temperatures begin to drop steadily till January which is generally the coldest part of the year. The mean daily maximum temperature in that month is of the order of 22^0 C (71.6^0F) while the mean daily min. temperature is of the order 8^0C (46.4^0F). During cold waves in the make of cold western disturbance the minimum temperature may sometimes come down to a degree or two below the freezing point of water, especially in January & February. And occasionally frosts may occur. From March the temperature rises rapidly. May is usually the hottest month when the daily max. temperature is of the order of 40^0C (104 ^{0}F) and the mean daily min. temperature is about 26^0C(78.8^0F). On individual days the day temperature may be as high as 46^0C(114.8^0F). With the advance of the South-west monsoon after the middle of June, the temperature falls but the relief from the heat is not marked because of

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the added discomfort from the increase in humidity, brought in by the monsoon air, the nights become progressively cooler. After October , there is an appreciable fall in both day and night temperature. Dry air prevails over the district except during the South-west monsoon. In summer months, particularly in the afternoons, humidity is relatively very low.

During the South – west monsoon skies are moderately to heavily cloud generally and over-cast on some days; in the rest of the year they are clear or lightly clouded. But in winter, because of the passing western disturbance, skies again tend to become cloudy. The average annual rainfall in the Jhalawar district is 125 mm.

Winds are generally light to moderate with slight strengthening in summer and in early monsoon. Westerly to Southwesterly winds prevail in the monsoon season. In the post monsoon and winter months winds are light, mostly from directions between west and north with frequent calm intervals. In summer, winds blow from directions South-west and North-west.

1.6TRANSPORT AND COMMUNICATION:-

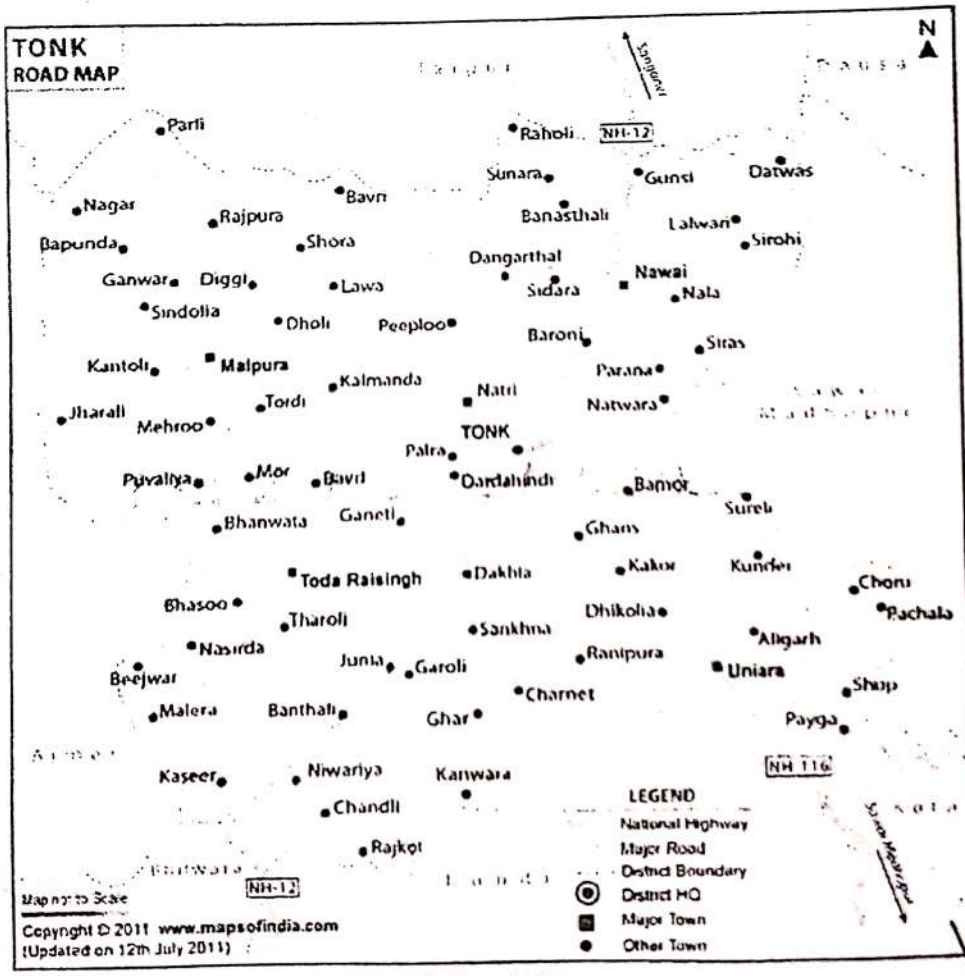

Figure 3.0: Road Map

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Highway (NH,SH,MDH & Others)	Length (in Kms)
(a) National Highway	198.70
(b) State Highway	832.46
(c) Main District Highway	514.13
(d) Other district Roads	812.63
(e) Rural road	4812.31
Total Length in kms Passing in Tonk District.	7170.23

** As on 2017-18, PWD, Rajasthan*

Jaipur International Airport is situated at 98 km from Tonk. The second nearest airport to Tonk is Kishangarh Airport which lies at a distance of 168 km from Tonk. There are a number of airlines that operate their flights from both airports.

Tonk lies on the Bhopal-Jaipur-Ahmadabad-Mumbai Railway line and so many trains have stoppage at Niwai (Tonk). Trains connecting all the major cities of India pass through the station.

Tonk, being a very small town, isn't well connected to the rest of the country. The nearest major railway station is Banasthali-Niwai, about 35 km away from tonk.

1.7FLORA & FAUNA OF THE DISTRICT:

In the district Tonk, the main crop season is Rabi & Kharif. The principal crops of Rabi season are wheat, barley, gram, rap and mustard, linseed. Small millets, taramira, coriander & zeera etc and of Kharif season are maize , bajra, jawar, rice, cotton, tur, sugarcane, groundnut, seas mum, cirad, moong, month etc.

The climate of district Tonk is quite favorable of producing vegetables and fruits specially guava, papaya, lemon, onion, pomegranate, tomatoes and chilies.

The main species of trees are Dhonk, Kahir, Chills, Khejra, Shisham, Siris, Tendu, Babul, Neem, Burgud, Pipal and Ber mainly. At present the fauna is considerably reduced and only deer, hare, grey patridges and small sand grouse are generally found.

In the Tonk district, however, the fauna is considerably reduced. Only deer, hare grey partridges and small sand grouse are commonly founds. Nilgai also found in some parts. During winter months the numerous tanks are usually full of wild fowls. The pools provided good fishing.

1.8SOCIO ECOMOMIC PROFILE OF THE DISTRICT:

The district of Tonk is mainly agriculture based, and animal husbandry constitutes the main occupation of the people. Tonk district is quite backward in terms of industries. The state Government office of District Industries is working hard to promote the small, medium-scale and handicrafts industries in the district. The RIICO and Khadi gramodyog

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offices are also working side-by-side in order to try and provide land to industries. Six RIICO industrial areas are working in Tonk, Newai, Malpura and Deoli Tehsil, and about 600 acres of land have been acquired for industrial purposes. The slate stone industry is fully developed in Deoli in the district. Based on Slate stone some other industries like quartz grinding, PCC Poles and RCC Pipes are also in operation. Among the other industries developing in the district are readymade garments, engineering works, tire retarding, woolen carpets, tomato ketchup, animal breeding and washing shop industries. Items exported from the district include slate stone and state tiles, cotton durrih, galicha, namda, readymade garments and ball bearings.

1.9 GROUND & SURFACE WATER SCENARIO OF DISTRICT:

Geology The district is underlain by the rocks of Bhilwara Super Group comprising mainly of mica schist, gneisses, phyllites and quartzites having small intrusive granite. These hard rocks are overlain by the alluvium of Recent to Sub-Recent age consisting mainly of clay, sand and silt. Geological map of the district is presented in map.

Hydrogeology Ground water occurs mostly under phreatic conditions. In alluvial areas, ground water generally occurs under water table conditions where as in hard rock and crystalline rocks, it is under slight pressure. The weathered zone below the water table acts as a good storage zone. The movement of ground water is controlled by the porosity in the weathered zone and joints, fissures, fractures, bedding planes and other structurally weak zones in hard rock and grain size distribution in alluvium. The 5 movement is further controlled by the extent, size, openness, continuity and interconnection of fractures. Quaternary alluvium, phyllites, schists, and granitic gneisses are the major hydro geological formations in the district.

Aquifer System Alluvium and blown sand aquifers: Ground water in alluvial areas, the main ones being Negaria and Tonk valley fills, occurs under unconfined conditions. In alluvium, ground water occupies the open space between particles of sand, gravel and claykankar. In an area of about 75 sq. km., enclosed between Tordi-Chandsen ridge, ground water occurs mostly in aeolian sand. Locally, such as on the northern periphery of Tordi Sagar and southern periphery of Bhairon Sagar, it occurs in gravel 6 beds. In three borings, sunk on the western half of the valley fill, bed rock was encountered within 30 m for small drawdowns. The yield of tube wells in Negaria valley fill varies from 650 to 1518 lpm for a draw down from 0.60 to 2.15m while yield of tube wells in Tonk valley fill, located near Tonk was recorded to be 900 lpm for a drawdown of 0.90m.

The water table intercepts the land surface near the right bank of Banas river along the contact of alluvium with bed rock as evidenced by large number of springs seen for about 1.8 km between Negaria and Chhan, at Dudas 200 m NW of village in the Negaria and for about 2 km between Mendwas and Aminpura in the Tonk valley. The discharge of

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most of these springs is very low. However, large pools are formed all along such seepage zones.

Hard Rock Aquifer: Hard rock aquifer forms about 80% of the net area of the district suitable for ground water recharge. The major water bearing hard rock formations in the area are mica-schist, phyllites, banded gneissic complex and quartzites. Out of these, mica-schist occupies the largest area. Ground water occurs under water table condition in joints and foliation planes. It being susceptible to weathering, top portion is invariably covered with thin clay. Water bearing capacity of this formation is poor. The yield of open wells, having 3 to 4 m diameter, varies from 3 to 50 m3 /day.

Recuperation is markedly slow. Total recuperation takes place between 12-72 hours. At places, veins of pegmatites have intruded the schist. Ground water circulates through the contact between the intrusive and the country rock. The recuperation of water in wells tapping such formations is relatively faster. Depth to water in schist ranges from 4 to 19 m bgl. Specific capacity varies between 0.0751- 0.2762 m3 /min/m. Ground water in phyllite occurs under water table condition in joints, fissures and fractures. This aquifer is also quite susceptible to weathering with thickness of weathered zone varying from 2 to 10 m. The depth to water ranges from less than a meter to as high as 23 m.

Phyllite being compact in nature has poor water yielding capacity. The wells of 3-4 m diameter yield between 6 to 150 m3 /day. The rate of recuperation is faster in comparison to mica-schist. The specific capacity works out to be 0.034m3 /min/m. Ground water in gneisses occurs under water table conditions in joints and fractures. Depth to water ranges from 6 to 24m. Yield of the wells in gneissic complex is highly variable. It ranges from 1.5 m3 /day to 150 m3 /day. Specific capacity is computed for high yielding well is 0.05 m3 /min/m. Quartzite generally occurs intercalated with phyllites. These are brown, hard and jointed. Thickness of fractured zone varies from 2-15 m. Depth to water ranges from 3-24 m bgl. Yield of wells varies from 30-120 m3 /day. 5.2.2

Aquifer Parameters Coefficient of permeability of wells in Nagaria valley fill ranges between 318 and 692 m/day, transmissivity varies from 1976 to 4585 m2 /day and storage coefficient ranges between 0.083 and 0.20. The coefficient of transmissivity, permeability and storage coefficient of well in Tonk valley fills were computed to be 5488 m2 /day, 518 m/day and 0.146 respectively.

The results of hydro geological tests conducted in the valley fills indicated that the aquifer material near the Banas River (Tonk wells) and in the central part of the Negaria valley fill is more permeable than further away. The high values of transitivity also indicate that aquifer material is capable of transmitting large quantities of water. The values of storage coefficient correspond to unconfined conditions. Central Ground Water Board under Ground water exploration programme during 1993-94 drilled 6 slim holes in the district.

The exploratory borehole data indicate that total depth drilled varies from 22 to 40 m having discharge up to 100 lpm. Alluvium is underlain by crystalline bed rock of Bhilwara Super Group. During the year 2001-02 under accelerated exploratory programme,13 exploratory/production wells were drilled by CGWB in the consolidated formation. 7 The exploratory drilling data reveals that total depth drilled varies from 76 to 162 m bgl having discharge from 50 to 450 lpm with draw down from 20 to 52 m. During AAP 2008-09 six tube wells were drilled up to 112 meters and a discharge of 125 to 2000 lpm has been recorded in Peeplu ki dhani. 5.2.3 Well Design the large diameter dug wells are the most popular ground water abstraction structures in Tonk district. The dug wells range in depth from a few meters to around 30 meters having 3 to 4 m diameter and are circular in shape with masonry linings in alluvial areas. Banas River tract is highly productive and is suitable for construction of high capacity tube wells with discharge of over 1000 to 1500 lpm for small draw down of generally less than 10 m within depth of 45 metres.

Rest of the fresh water hard rock area is suitable only for medium to low capacity tube wells down to the depth of 150m. 6.0 Water Level Scenario Central Ground Water Board periodically monitors the National Hydrograph Network Stations (NHNS) stations in the Tonk district, four times a year i.e. in January, May (Pre monsoon), August and November (Post monsoon). 6.1 Depth to Water Level during Pre monsoon (May, 2011) Depth to water level during May, 2011 varied from 2.75 mbgl to 33.43 m bgl recorded at Todaraisingh and Niwai respectively

Deeper water levels between 20m and 40 m bgl in isolated patches exist in central and eastern parts of district in the blocks of Niwai, Unihara and Tonk. Shallow water level less than 5 m bgl have been recorded in the eastern part of the district mostly in the blocks of Malpura and Todaraisingh. 6.2 Depth to Water Level during Postmonsoon (November, 2011) Depth to water level during November, 2011 varied from 1.17 mbgl at Jaisinghpura to 26.25 m bgl at Niwai. The depth to water level map for November, 2011 shows that water levels between 20m and 40 mbgl were observed in isolated patches in Niwai block. Shallow water level less than 5 m bgl has been recorded in parts of Malpura, Tonk, Todaraisingh and Deoli. Major part of the district has water levels between 5 and 20 mbgl.(May 2011). About surface scenario the district is drained by Banas River and its tributaries. The Banas River enters into Tonk district at Negaria in Deoli tehsil from where it takes a serpentine course dividing the district in roughly two parts; two-thirds of the area falling on its north and one-third on its south until it leaves the district at Sureli near Barawara station. It runs for roughly 135 km in the district. It is more than half a km in width and sometimes runs in 9 m deep channel. It is more or less perennial. It develops a dendritic pattern and forms a deep gorge at Rajmahal. Its left bank is stable and rocky while the right bank is covered by alluvium.

The Mashi and Sohadra are the major tributaries of Banas in the district. Both are ephemeral in nature. Sohadra is considered as an important river of the district as it feeds the Tordi Sagar dam which is one of the biggest irrigation dam in Rajasthan.

It joins Mashi River near village Dundia in Tonkdistrict; thereafter it meets Banas river near Galod village.

1.10SEISMICITY:

As per seismic zoning map of India IS 1893 (Part-I): 2002, Figure 5, the major part of Rajasthan lies in Zone – II and Western parts of the districts of Barmer and Sirohi as well as northern sections of Alwar district lie in Zone IV, where the maximum intensity could reach VIII (MSK). The remaining areas of Barmer and Sirohi districts, as well as the districts of Bikaner, Jaiselmer and Sirohi lie in Zone III. The north-eastern districts of Jhunjhunu, Sikar, Bharatpur and the rest of Alwar also lie in Zone III. The rest of the state, including the capital, Jaipur, lie in Zone II, where the maximum intensity expected would be around MSK VI, as is evident from the Seismic Zone Map of Rajasthan shows that some portion of district Barmer, Jalore, Alwar and Bharatpur lie under Zone – IV.

Figure 4.0: Map showing Seismic Zones of India and Rajasthan

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CHAPTER -2

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OVERVIEW OF MINING ACTIVITY IN THE DISTRICT

2.0 OVER VIEW OF MINING ACTIVITY IN THE DISTRICT:

Regarding the mineral potential, the district is the producer of silica sand, mica, and Phyllite-schist, Garnet, Granite, Masonary-stones, Quartz, Feldspar and Bajri (sand).

MINERAL RESOURCES:

Tonk district is empowered with many minerals and its important occurrences of garnet, silica sand, mica, and Phyllite-schist, Granite, Masonary-stones, Quartz, Feldspar and Bajri (sand). Mining areas encompass area under surface mining operations. The recognizable impacts of these activities on the landscape are unmistakable giant pit mines covering vast areas. The presence of water bodies does not necessarily imply inactive or unused extractive areas; ponds or lakes are often an integral part of an extractive operation. It includes surface rocks and stone quarries, sand and gravel pits, brick kilns, etc. These are areas of stockpile of storage dump of industrial raw material or slag/effluents or waste material or quarried/mixed debris from earth's surface. Total Mining areas cover about 3.04 sq km area in Tonk district which is 0.05 % of the entire area of the district.

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DISTRICT SURVEY REPORT, TONK

(Under Ministry of Environment, Forest & Climate Change, New Delhi, Notification Date 25-07-2018)

THE LIST OF MINING LEASES IN THE DISTRICT WITH LOCATION, AREA AND PERIOD OF VALIDTY

3.0 THE LIST OF MINING LEASES IN THE DISTRICT WITH LOCATION, AREA AND PERIOD OF VALIDTY

कार्यालय सहायक खनि अभियन्ता टोंक

बजरी के एल.ओ.आई. क्षेत्र का विवरण

क्र. स.	एल.ओ.आई. / टी डब्यूपी धारक का नाम	एल.ओ.आई. / टी डबलयू पी का क्षेत्र का विवरण	क्षेत्रफल हेक्टर में	डी डब्यू पी जारी होने की तिथी	डी डब्यू पी के तहत कार्य प्रारम करने की तिथी	खनन कार्य की वर्तमान स्थिति	विशेष विवरण
1	2	3	4	5	6	7	8
1	श्री अमन सेठी	जिला टोंक की तहसील पीपलू बनास नदी	846.32	19.12.2013	22.12.2013	दिनांक 16.11.17 से बंद	एल. ओ.आई.
2	शेखावत ऐसोसियेट्स	जिला टोंक की तहसील पीपलू मासी नदी	889.925	19.12.2013	31.12.2013	खनन कार्य वर्तमान में चालू है	खनन पट्टा
3	एस आर ऐसोसियेट्स	जिला टोंक की तहसील देवली	1598.31	19.12.2013	22.12.2013	खनन कार्य वर्तमान में चालू है	खनन पट्टा .
4	श्री मंगल सिंह सौलकी	जिला टोंक की तहसील निवाई	104.49931	20.12.2013	31.12.2013	खनन कार्य वर्तमान में चालू है	खनन पट्टा
5	श्री राहुल पंवार	जिला टोंक की तहसील मालपुरा	316.575	19.12.2013	29.12.2013	खनन कार्य वर्तमान में चालू है	खनन पट्टा
6	श्री प्रदीप कुमार सेठी	जिला टोंक की तहसील टोंक	2389.36	19.12.2013	22.12.2013	खनन कार्य वर्तमान में चालू है	खनन पट्टा
7	चाडक ऐसोसियेट्स	जिला टोंक की तहसील उनियारा	177.64	19.12.2013	29.12.2013	दिनांक 31.10.14 से बंद	एल. ओ.आई.
8	चाडक ऐसोसियेट्स	जिला टोंक की तहसील टोडारायसिंह	1260.96	19.12.2013	27.12.2013	दिनांक 31.10.14 से बंद	एल. ओ.आई.

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CHAPTER -4

DETAILS OF ROYALTY OR REVENUE RECIVED IN LAST THREE YEARS

4.0DETAILS OF ROYALTY OR REVENUE RECEIVED IN LAST THREE YEARS

कार्यालय सहायक खनि अभियन्ता टोंक

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बजरी के एल.ओ.आई. क्षेत्रो से गत तीन वर्षो में प्राप्त राजस्व का विवरण						(लाखो में)
क्र. स.	एल.ओ.आई. / टी डब्यूपी धारक का नाम	एल.ओ.आई. / टी डबलयू पी का क्षेत्र का विवरण	क्षेत्रफल हेक्टर में	वर्ष 2019–20	वर्ष 2020–21	वर्ष 2021–22
1	2	3	4	5	6	7
1	श्री अमन सेठी	जिला टोंक की तहसील पीपलू बनास नदी	846.32	0	0	0
2	शेखावत ऐसोसियेट्स	जिला टोंक की तहसील पीपलू मासी नदी	889.925	0	0	0
3	एस आर ऐसोसियेट्स	जिला टोंक की तहसील देवली	1598.31	0	0	57759276.0
4	चाडक ऐसोसियेट्स	जिला टोंक की तहसील टोडारायसिंह	1260.96	0	0	0
5	श्री मंगल सिंह सौलकी	जिला टोंक की तहसील निवाई	104.49	0	0	0
6	श्री राहुल पंवार	जिला टोंक की तहसील मालपुरा	316.575	0	0	0
7	श्री प्रदीप कुमार सेठी	जिला टोंक की तहसील टोंक	2389.36	0	0	0
8	चाडक ऐसोसियेट्स	जिला टोंक की तहसील उनियारा	177.64	0	0	0

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CHAPTER -5
DETAILS OF PRODUCTION OF SAND OR BAJRI OR MINOR MINERALS IN LAST THREE YEARS

5.0 DETAILS OF PRODUCTION OF SAND OR BAJARI OR MINOR MINERALS IN LAST THREE YEARS

कार्यालय सहायक खनि अभियन्ता टोंक

बजरी के एल.ओ.आई. क्षेत्रो में गत तीन वर्षो में उत्पादन का विवरण

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(टन में)

क्र. स.	एल.ओ.आई. / टी डब्यूपी धारक का नाम	एल.ओ.आई. / टी डबलयू पी का क्षेत्र का विवरण	क्षेत्रफल हेक्टर में	वर्ष 2019–20 में खनिज बजरी का उत्पादन	वर्ष 2020–21 में खनिज बजरी का उत्पादन	वर्ष 2021–22 में खनिज बजरी का उत्पादन
1	2	3	4	5	6	7
1	श्री अमन सेठी	जिला टोंक की तहसील पीपलू बनास नदी	846.32	0	0	0
2	शेखावत ऐसोसियेट्स	जिला टोंक की तहसील पीपलू मासी नदी	889.925	0	0	0
3	एस आर ऐसोसियेट्स	जिला टोंक की तहसील देवली	1598.31	0	0	1155185.52
4	चाडक ऐसोसियेट्स	जिला टोंक की तहसील टोडारायसिंह	1260.96	0	0	0
5	श्री मंगल सिंह सौलकी	जिला टोंक की तहसील निवाई	104.49931	0	0	0
6	श्री राहुल पंवार	जिला टोंक की तहसील मालपुरा	316.575	0	0	0
7	श्री प्रदीप कुमार सेठी	जिला टोंक की तहसील टोंक	2389.36	0	0	0
8	चाडक ऐसोसियेट्स	जिला टोंक की तहसील उनियारा	177.64	0	0	0

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CHAPTER -6
PROCESS OF DEPOSITION OF SEDIMENTS IN THE RIVERS OF THE DISTRICT

6.0PROCESS OF DEPOSITION OF SEDIMENTS IN THE RIVERS OF THE DISTRICT

Fine (Suspended) Sediments transported in rivers originate mainly from the top soil of the catchment and from bank of the channels. 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 banks, eroding the bank, but is slowest on the inside of the banks, allowing deposition of sand and gravel. When a river "bursts its banks" after heavy rain, flood water spreads out

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across the floodplain and, because this water hardly moves, finer silt and clay are deposited – often making good farmland!.The loose boundary (consisting of movable material) of an alluvial channel deforms under the action of lowing water and the deformed bed with its changing roughness (bed forms) interacts with the flow. The resulting movement of the bed material (sediment) in the direction of flow is called sediment transport and a critical bed shear stress must be exceeded to start the particle movement. Such a critical shear stress is referred as incipient (threshold) motion condition, below which the particles will be at rest and the flow is similar to that on a rigid boundary. Some sediment particles roll or slide along the bed intermittently and some others saltate (hopping or bouncing along the bed). The material transported in one or both of these modes is called 'bed load'. Finer particles (with low fall velocities) are entrained in suspension by the fluid turbulence and transported along the channel in suspension. This mode of transport is called 'suspended load'. Sometimes finer particles from upland catchment (sizes which are not present in the bed material), called 'wash load', are also transported in suspension. The combined bed material and wash load is called 'total load'. The Tonk district has a well developed drainage system. Banas (more or less perennial), Dai, Khari ,Masi,Bandi, Sohadra & Galwa rivers (ephemeral)and flow only in response to precipitation. These rivers originating in mountainous regions are monsoon fed rivers and flow more rigorously in rainy season. The running water erode, transport and deposit sediments. The deposition of sediments in a river bed is more pronounced during rainy season, although the quantum of deposition varies from stream to stream, depending upon numbers of factors such as rainfall, catchment, Lithology, discharge, river profile and geomorphology of the river course.

There is a large amount of uncertainty in the process of calculating annual rates of bed load transport. How much coarse material is moved, how long it remains in motion as also how far it moves depends on the size, shape & packing of the material and the characteristics of the river flow.

It has been reported that in past, when sand/Bajri mining was permissible in Tonk district,during monsoon season the pits formed by the excavation of sand/Bajri in rivers gets completely filled up by sediments and as such the excavated area gets replenished with new harvest of mineral sand. The rivers of the district /state are ephemeral in nature and not replenished annually as compared to perennial rivers and therefore, the concept of annual replenishment is not much applicable due to erratic and uncertainty of rainfall in the district/state

6.1DISTRIC WISE DETAILS OF RIVER OR STREAM AND OTHER SAND SOURCE

The district is drained by Banas River and its tributaries. The Banas River enters into Tonk district at Negaria in Deoli Tehsil from where it takes a serpentine course dividing the district in roughly two parts; two-thirds of the area falling on its north and one-third on its south until it leaves the district at Sureli near Barawara station. It runs for roughly 135 km in the district. It is more than half a km in width and sometimes runs in 9 m deep channel. It is more or less

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perennial. It develops a dendritic pattern and forms a deep gorge at Rajmahal. Its left bank is stable and rocky while the right bank is covered by alluvium.

The Mashi and Sohadra are the major tributaries of Banas in the district. Both are ephemeral in nature. Sohadra is considered as animportant river of the district as it feeds the Tordi Sagar tank which is one of thebiggest irrigation tank in Rajasthan.

It joins Mashi River near village Dundia in Tonkdistrict; thereafter it meets Banas river near Galod village. There are also 2 otherminor streams in the district namely Khari & Dai, both are intermittent in nature

District wise Details of River:

S. No.	Name of River	Length (In kms)	Entrance Point in District
1.	Banas	111.0	Enters in tonk District near village Bhoraya.
2.	Dai or Dain River	2.635	Tributary of Banas River enters in North Western side of tonk district
3.	Khari River	9.38	Tributary of Banas River enters in south west side of tonk district
4.	Mashi River	35.56	This river enters in Jaipur from nearly village Jodhpura.
5.	Sodara Nadi	10.90	This river enters in mansi river village dandia & Banas river near village Gehlod .
6.	Galwa Nadi	7.00	Tributary of Banas River enters in Chouth Ka Barwada south East side of tonk district
7.	Bandi	11.50	This river enters in near Village Chatarpur of Tonk District.

Drainage System with Description of Main Rivers:

S. No.	Name of River	Area Drained (Sq. Km.)	% Area Drained
1	Banas	113.20	21.68
2	Dai or Dain River	2.635	2.74
3	Khari River	2.91	5.82
4	Mashi River	17.78	20.67
5	Sodara Nadi	2.18	12.65
6	Galwa	0.28	5.14
7	Bandi	4.00	0.78

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DISTRICT SURVEY REPORT, TONK

(Under Ministry of Environment, Forest & Climate Change, New Delhi, Notification Date 25-07-2018)

Salient Features of Important Rivers and Streams:

S. No.	Name of River	Total Length in the district (in Km)	Place of Origin	Altitude at Origin
1	Banas	111.0	Enters in tonk District near village Bhoraya.	313
2	Dai or Dain River	2.635	Tributary of Banas River enters in North Western side of tonk district	317
3	Khari River	9.38	Tributary of Banas River enters in south west side of tonk district	318
4	Mashi River	35.56	This river enters in Jaipur from nearly village Jodhpura.	285
5	Sodara Nadi	10.90	This river enters in mansi river village dandia & Banas river near village Gehlod .	349
6	Galwa Nadi	7.00	Tributary of Banas River enters in Chouth Ka Barwada south East side of tonk district	284
7	Bandi	11.50	This river enters in near Village Chatarpur of Tonk District.	290

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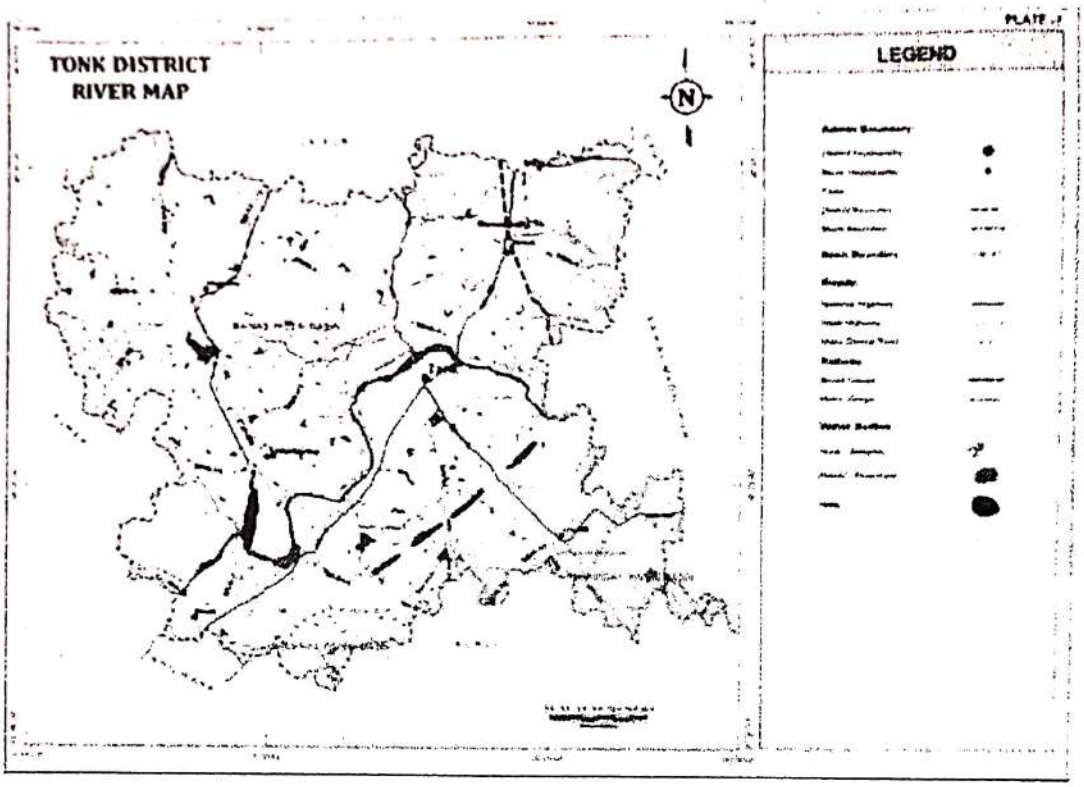

Figure 5.0: Map showing River of the District

6.2 DISTRICT WISE AVAILABILITY OF SAND AND GRAVELS OR AGGREGATE RESOURCES:

For the calculation of total reserves of sand available in the river bed, length, average width and depth of the river bed for which the exploitation is to be carried out /allowed under rule / prevailing instructions of the Govt. was taken into consideration. The volume thus obtained is multiplied with the bulk density which has been assumed as 2.25. Reserves up to particular datum line i.e. 1.5 meter below the surface have been calculated.

- Total reserves of Minor Minerals (Ton) = Length x Width x Height i.e. Depth x Density.
- Total Sand Reserved = Area X Depth X 2.25 (Bulk density of sand/gravel. Boulder)

Portion of the River or Stream Recommended for Mineral Concession	Length of area recommended for mineral concession (In Kms)	Average width of area recommended for mineral concession (In m)	Area recommended for mineral concession (in sq. m)	Mineable mineral potential (in metric tonne) (60% of total mineral potential)
Banas	105.6	250	8,91,00,000.0	5,34,60,000.0
Masi	51.94	120	2,10,35,7,00.0	1,26,21,420.0

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Sohdra	25.60	20	17,28,000.0	10,36,800.0

Resources calculated of Bajri in Rivers (Banas, Mashi, Sodara and Galwa)and its nallahs section assuming the 1.5 m. Depth.

6.3ANNUAL DEPOSITION OF SAND/SEDIMENTS (REPLENISHMENT) IN CATCHMENT AREA IN TONK DISTRICT:

There are large no. of rivers and streams in the district but in most of them the supply of water diminishes rapidly of fails entirely soon after end of the rains. The landscape being undulating and abnormally sloping, the nallahs, revaluates and rivers rising from the hillocks and hills send out torrential currents during the rains which generally run to waste cutting deep ravines and gorges in the basin traces. The carrying capacity of the river decreases as a result of which all the load carrying by the river is deposited. This stream has developed a high flood plain near the confluence of river as during flood season the velocity of this stream is checked by the water of river and most of send sediments load is deposited near the confluence point.

The annual replenishment in the river depends upon the amount of precipitation, velocity of the river, catchment area etc. Annual replenishment is depending upon the period of rainy season and rainfall and surface run off at different places of the flow of river.

6.4 DATA COLLECTION ANALYSIS AND ESTIMATION OF REPLINESHMENT:

Initially river stretch demarcated through latitude & longitude by Department of Mines & Geology (Rajasthan).Where river Sand/Bajri mining can be permitted based on available reserves.The pre monsoon CSV file uploaded on website. Original ground level established at each cross-section and reserve also calculated for pre-monsoon season. Databases structured tabulated form clearly mentioning the nomenclature of the section line, latitude & longitude of both the extents of section line, chainage and respective levels of all the points taken on that section line. Reserves estimated with the help of specific gravity verified by the Department of Mines & Geology, Rajasthan, between every two consecutive section. A plan clearly mentioning the width of the river, lease boundaries, left under safety zones as prescribed under Sustainable Sand Mining Management Guideline 2016, and Rajasthan Miner Mineral concession Rule 2017, and. Enforcement & Monitoring Guidelines for Sand Mining 2020.

The same process repeated for post monsoon while surveying by DGPS, collection of samples for determination of Sp. Gravity preparation of plan & section at every 200m level determination of original ground level, Reserve estimation based on the data collection and quantification of sand transported during the monsoon season. Based on the quantification of material deposited in the river bed, working plan has been prepared/ proposed for farther excavation.

The Replenishment study carried out by other agencies in the Tonk district is given below:

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S. No.	Name of Lease Holder	Lease Area (In Ha.)	Tehsil/ District	Replenishment study Aren (In Ha.)	Name of River	Geological Reserves	Mineable Reserves
						Tonnage of Mineral (Replenished)	Tonnage of Mineral (Replenished)
1.	Shri Aman Sethi	846.32	Piploo/Tonk	846.32	Banas	4455000*	3564000*
2.	Sekhawat Associates	889.93	Piploo/Tonk	889.925	Mashi	1012500*	810000*
3.	S.R. Associates	1598.31	Deoli/Tonk	1598.31	Banas	59833994.02**	19944664.67**
4.	Chandak Associates	1260.96	Todaraisingh/ Tonk	1260.96	Banas	438750*	351000*
5.	Shri. Mangal Singh Solanki	104.49	Newai/Tonk	104.49	Mashi	270000*	2160000*
6.	Shri. Rahul Panwar	316.58	Malapura/Tonk	316.575	Sohdra	945000*	756000*
7.	Shri. Pradeep Kumar Sethi	2389.36	Tonk/Tonk	2389.36	Banas	5433750*	4347000*
8.	Chandak Associates	177.64	Uniyara/Tonk	177.64	Banas	2362500*	1890000*

Source:- Replenishment study based on Topographical Survey record provided by LOI Holder.
*Note: *Based on CMPDI data , ** Based on 2021 Studies*

6.5 MINERAL POTENTIAL OF MINERAL BAZRI:

The resources of the rivers are to be calculated on the basis of the replenishment study in Pre-monsoon and Post-monsoon of the district.

Rivers/Streams	Boulder (In MT)	Sand/Bajri (In MT)	Total Mineable Mineral Potential (In MT)
Banas	Non-estimated	30,096,664.67	30,096,664.67
Masi	Non-estimated	29,7,0000	29,7,0000
Sohdra	Non-estimated	75,6,000	75,6,000

Note: The potential of mineral Bajri will be ascertained every pre-monsoon & post-monsoon based on actual replenishment.

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6.6 METHODOLOGY ADOPTED FOR CALCULATION OF MINERAL:

The rivers in the district are monsoon fed rivers. These rivers flow only in rainy season and carry some load of sediments which are produced due to erosion of the country rocks in the catchment. The running water transports the sediments in river beds occasionally and deposited the same at suitable locci. The quantum of deposition of sediments varies from stream to stream, depending upon numbers of factors such as rainfall in catchment area, Lithology of catchment, discharge velocity, river profile and geomorphology of the river course. Sand replenishment in monsoon fed river is governed with a dynamic process which depends mainly on monsoon rains and other factors mentioned above, therefore area specific long term study need to be carried out for reaching average figures of quantity of sand/Bajri replenishment in the rivers of the district.

Exact figures of replenishment will be calculated by project proponent at the time of preparing mining plan and getting EC. However, it has been reported that in past when sand/Bajri mining was permissible in the district (since year 2013 sand mining has been prohibited by the Government), during monsoon season the pits formed by the excavation of sand/Bajri in rivers occasionally gets filled up by sediments and as such the excavated area sometimes gets replenished with new harvest of mineral (sand). Tentative mineral potential of sand in important rivers of the district is estimated with the help of Survey of India Toposheet and through local information and is tabulated above. The mineral resources have been calculated upto 1.50 meter depth.

6.7 GENERAL RECOMMENDATION / CONCLUSIONS:

During the preparation of the present report prominent rivers/ streams has been studied, as the rest of the streams/rivers either have very insignificant annual replenishment/ approachability problem or are very narrow at most of the places and as such are not fit for grant of mineral concession for mining of river sand, however it is also important to mention here that because of the regular demand of sand, stone and bajri for the developmental activities in the respective areas, such streams are prone to illegal mining, It is suggested that the auctions of quarries be done regularly to meet out the local demand subject to the approval from competent authority as per RMMCR 2017. These mineral concessions shall also reduce demand load and will be helpful to minimize illegal extraction of minerals, failure of which may result in to illegal mining at odd hours and shall be haphazard and more detrimental to the local ecology. Irrespective of it following geo-scientific considerations is also suggested to be taken into account during the river bed mining in a particular area:

1. Promotion of manufactured sand (M-Sand), artificial sand and alternative technologies in construction materials and processes are required for reducing the dependence and demand on naturally occurring sand and gravel. Development of slag sand, sand from stone chips and there certification under BIS is an important step in this direction.
2. Stream should not be diverted to form inactive channel.

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3. Mining below subterranean water level shall not be allowed as a safeguard against environmental contamination and over exploitation of resources.
4. Large rivers and streams whose periodic sediment replenishment capacities are larger, may be preferred than smaller rivers, however there no such rivers in the district.
5. Segments of braided river system should be used preferably falling within the lateral migration area of the river regime that enhances the feasibility of sediment replenishment.
6. Mining at the concave side of the river channel shall not be allowed to prevent bank erosion. Similarly meandering segment of a river shall be selected for mining in such a way as to avoid natural eroding banks and to promote mining on naturally building (aggrading) meander components.
7. Continued riverbed material mining in a given segment of the river will induce seasonal scouring and intensify the erosion activity within the channel. This will have an adverse effect not only within the mining area but also both in upstream and downstream of the river course. Hazardous effects of such scouring and enhanced erosion due to riverbed mining should be evaluated periodically and avoided for sustainable mining activities.
8. The EC should stipulate conditions for adequate steps to check soil erosion and control debris flow etc. by constructing engineering structures.
9. Mining shall not be undertaken in a mining lease located in 200-500 meter of bridge, 200 meter upstream and downstream of water supply / irrigation scheme, 100 meters from the edge of National Highway and railway line, 50 meters from a reservoir, canal or building, 25 meter from the edge of State Highway and 10 meters from the edge of other roads except on special exemption by the Sub-Divisional level Joint Inspection Committee.

Project proponent will fulfill conditions of Sustainable Sand Mining Management Guidelines 2016 as:

a. The Project Proponent shall report monitoring data on replenishment, traffic management, and levels of production, River Bank erosion and maintenance of Road etc. The annual replenishment report shall be certified by an authorized agency
b. Mining should be done only in area / stretch identified in the District Level Survey Report suitable for mining and so certified by the Sub Divisional Level Committee after site visit.
c. Restoration of flora affected by mining should be done immediately. Lessee will preferably plant twice the number trees destroyed by mining of indibenous species. Each EC holder should plant and maintain for lease period at least 5 trees per hectare in area near lease or area demarcated by administration.
d. Project Proponent shall implement the Disaster Management Plan if the mine lease area is located in Seismic Zone-IV. Project Proponent shall appoint a Committee to have a check over any disaster to warn workers well before for the safety of the workers. Emergency helpline number will be displayed at all levels.

e. Project Proponent shall appoint an Occupational Health Specialist for Regular and Periodical medical examination of the workers engaged in the Project and records maintained; also, Occupational health checkups for workers having some ailments like BP, diabetes, habitual smokers, etc. shall be undertaken once in six months and necessary remedial/preventive measures taken accordingly. Recommendations of National Institute for Labour for ensuring good occupational environment for mine workers would also be adopted.

f. Use of alternate material such as M-sand in place of natural River sand shall be encouraged in order to reduce stress on natural eco-system.

6.8 DISTRICT WISE DETAILS OF EXISTING MINING LEASES OF SAND AND AGGREGATE:

Presently there is Three sand/Bajri mining lease and Five LOI is existed in the district.

List of Mining Lease in Bajri:

S. No.	Lessee Name	Address	Lease No.	Mineral Name	Near Village	Tehsil	District	Lease Period
1.	Shekhawat Associates	Plot no 575-A, Krishi nagar,Pratap Nagar, jaipur	13/2012	Bajri	Revenue villages of Tehsil Piploo	Piploo	Tonk	15.09.2022 to 28.10.2023
2.	S.R. Associates	Piplaj House, 5G, 9, R. C. Vyas Colony, Bhilwara (Rajasthan).	10/2012	Bajri	Revenue villages of Tehsil Deoli	Deoli	Tonk	15.01.2022 to 19.02.2023
3.	Shri. Mangal Singh Solanki	13, kamla Nehru nagar ke peeche, ajmer road, jaipur	12/2012	Bajri	Revenue villages of Tehsil Newai	Newai	Tonk	27.09.2022 to 09.11.2023
4.	Shri. Rahul Panwar	121, Sector 15, Sonipat, Haryana	18/2012	Bajri	Revenue villages of Tehsil Malapura	Malapura	Tonk	04.11.2022 to 15.12.2023
5.	Shri. Pradeep Kumar Sethi	A-189, New Friedns Colony, Delhi	09/2012	Bajri	Revenue villages of Tehsil Tonk	Tonk	Tonk	20.10.2022 to 24.11.2023

List of LOI in Bajri:

S. No.	Lessee Name	Address	Lease No.	Mineral Name	Near Village	Tehsil	District	LOI Date
1.	Shri Aman	S-541, Greater	16/2012	Bajri	Revenue	Piploo	Tonk	05.0.2013

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टोंक (राज.)

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	Sethi	Kailash II, New Delhi			villages of Tehsil Piploo			
2.	Chandak Associates	B-37-38, Ayodhya marg, Hanuman Nagar, Jaipur	08/2012	Bajri	Revenue villages of Tehsil Tonk	Tonk	Tonk	17.01.2013
3.	Chandak Associates	B-37-38, Ayodhya marg, Hanuman Nagar, Jaipur	07/2012	Bajri	Revenue villages of Tehsil Uniyara	Uniyara	Tonk	17.01.2013

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CHAPTER -7
GENERAL PROFILE OF THE DISTRICT

7.0DISTRICT AT A GLANCE:

Tonk district is located in north–eastern part of the state bordering jaipur in the north, Sawai Madhopur in the east, Bundi & Bhilwara in the South & Ajmer District in the west. Tonk is a Erstwhile Nawabi state before partition of India. Some worth visiting places in and around Tonk are Sunehari kothi, Hathi Bhatta, Jama Masjid & Bisalpur Dam, traditional Kunda called Baodi in Toda Raisingh town.

Brief Statistical Description of Tonk District:

S. No.	Items	Statistics
1.	Area	7194.00 Sq. Kms.
2.	Population	1421326
3.	Population Density	198 per sq.km
4.	Literacy	73.84%
5.	No. of Tehsil	7
6.	No. of Sub Divisions	7
7.	No. of Municipalities	8
8.	No. of Towns	6
	No. of Panchayat Samities	6
9.	No. of Villages	1235
10.	No. of Gram Panchayat	236

7.1DEMOGRAPHIC PROFILE:

An official Census 2011 detail of Tonk, a district of Rajasthan has been released by Directorate of Census Operations in Rajasthan. Enumeration of key persons was also done by census officials in Tonk District of Rajasthan. As per the Senses 2011 Rural & Urban population of the district is 11,03,603&3,17,723 respectively. Total population is 1421329. The total male and female population of the district is 728136 and 693190 respectively. Sex ratio of the district is 952. The population density of the district is 200 per sq km whereas; in the state it is only 206. The scheduled caste and scheduled tribe population in the district is 54068 (3.80 %) and 17694 (1.24%) respectively.

The literacy percentage of the district is 62.46 per cent. The male and female literacy of the district is 78.27 and 46.01 per cent, respectively.

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DISTRICT SURVEY REPORT, TONK

(Under Ministry of Environment, Forest & Climate Change, New Delhi, Notification Date 25-07-2018)

Demographic Details of the District:

S. No.	Items	Statistics
1.	Total Population	1421329
2.	Male Population	728136
3.	Female Population	693190
4.	Sex Ratio	952
5.	Urban Population	317723 (22.35%)
6.	Rural Population	1103603 (77.65%)
7.	Population Density	200 per sq.km
8.	Literacy Rate	73.84%

S. No.	Tehsil	Population		Total Population
		Male	Female	
1.	Tonk	147398	139410	286808
2.	Deoli	110648	103760	214408
3.	Newai	123624	122163	245787
4.	Uniyara	87223	81677	168900
5.	Malapura	123625	117284	240909
6.	Todaraisingh	74878	71992	146870
7.	Piploo	60740	56904	117644
8.	Nagar Fort	2906	2741	5647
9.	Dooni	5755	5540	11295

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CHAPTER -8
LAND UTILIZATION PATTERN IN THE DSITRICT: FOREST, AGRICULTURE, HORTICULTURE, MINING ETC.

8.0LAND UTILIZATION PATTERN IN THE DITRICT: FOREST, AGRICULTURE, HORTIVULTURE, MINING ETC.

AGRICULTURAL RESOURCES:

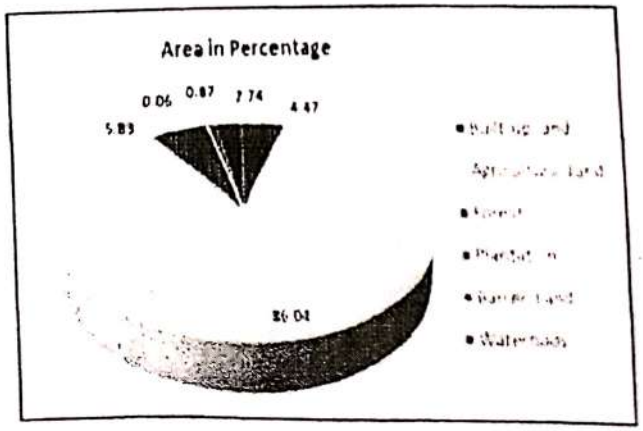
Agricultural is the main occupation of the people of Tonk and provides live hood to maximumnumber of people in the district. To access the potential industries for Tonk district it would be of worthto explore the land use pattern, irrigation facilities, occupation pattern, livestock population, dairy and cattledevelopment etc. which will provide a broad spectrum of resources inventories and resource base on whichthe foundation of the individuals growth is generally laid down.

LANDUSE PATTERN:

The total geographical area of Tonk district was recorded at 7,18,000 hectare. The classificationof land-use pattern found in the district during the year 2021-22 has remained as given under-

Brief information about land use classification is given below :

S. No.	Land Use	Area (Sq. Km)	Area (%)
1	Built-up land	323.05	4.47
2	Agricultural Land	6224.01	86.04
3	Forest	421.88	5.83
4	Plantation	4.18	0.06
5	Barren Land	62.91	0.87
6	Water-bodies	198.16	2.74
Total		**7234.19**	**100.00**



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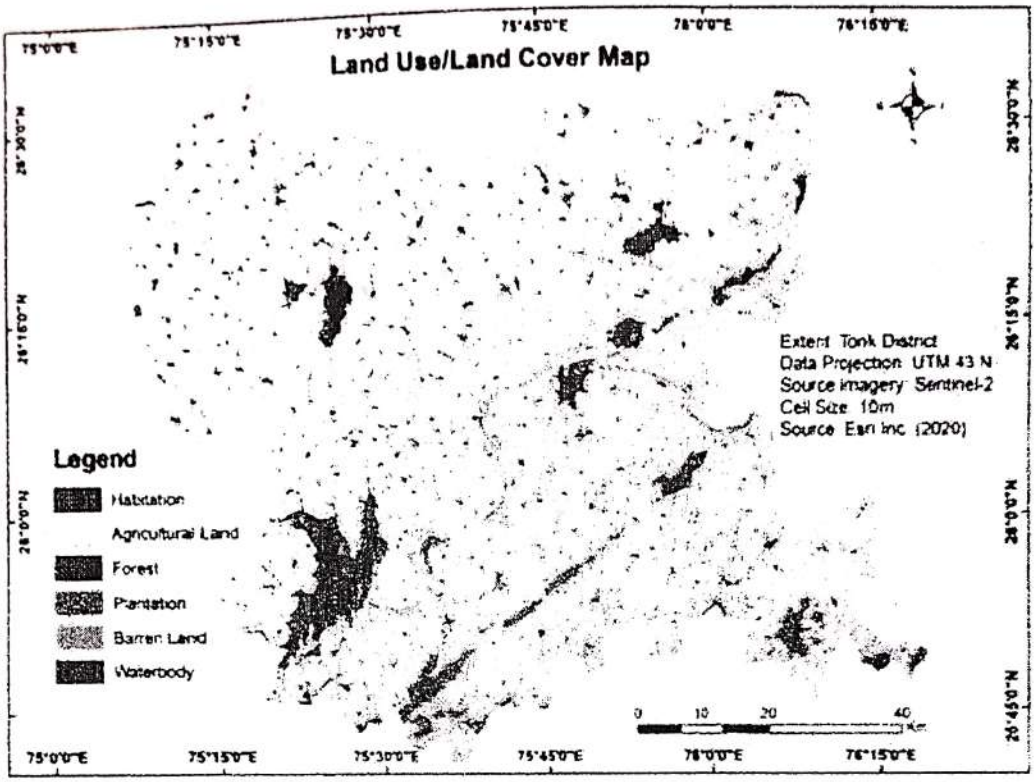

Figure 6.0: Land Use/ Land Cover Map of Tonk District

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CHAPTER -9
PHYSIOGRAPHY OF THE DSITRCT

9.0PHYSIOGRAPHY OF THE DISTRICT:-

Tonk district has the shape of kite or rhombus with its eastern and western sides bending somewhat inward and the south-eastern portion protruding between Sawai Madhopur and Bundi districts. The district is flat at a general elevation of about 214.32 meters above sea level with rocky but scrubby hills. The soils are fertile but somewhat sandy and the subsoil water too is limited. The distinguishing feature of Tonk district is the Aravali system, which starts from Bhilwara district and running along the boundaries of Bhilwara and Bundi districts, enters Tonk district in the south near Rajkot and countinues in a north eastern direction until it leaves the district near Banetha, A second chain lies in Tehsil Todaraisingh between the head quarter of the Tehsil Rajmahal where the Banas river flow through this hill. Another important hill is near Malapura and a small hillock near the border of Tehsil Sarwar of district Ajmer.

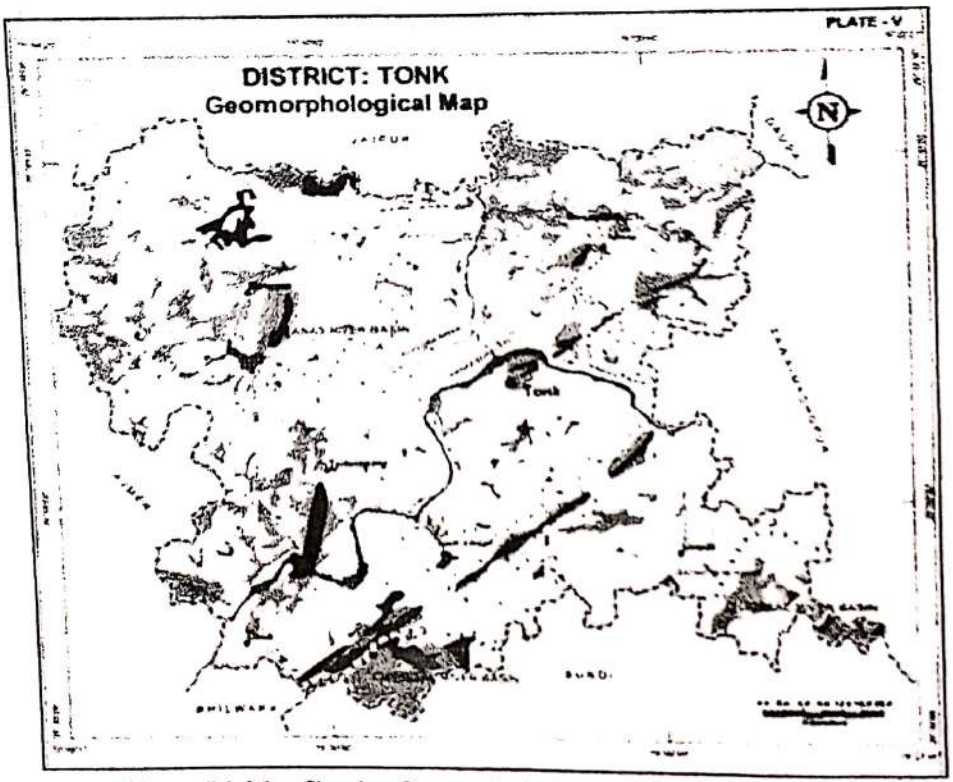

Figure 7.0: Map Showing Geomorphological Setup of Tonk District

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CHAPTER -10
RAINFALL- MONTHWISE

10.0RAINFALL:-

In India, the year has been divided into four seasons:

- Winter Season: December to February
- Summer Season: March to May
- Monsoon Season: June to September
- Post Monsoon Season: October to November

The Tonk district mainly receives Monsoonal rainfall between the months of late June to early September. Monthly rainfall data procured from Irrigation Dept. is shown below:

Month-wise Rainfall (in mm) of Tonk District for the Year 2021

S. No.	Rainfall Station	Rainfall mm(2021)				
		June	July	Aug	Sep	Oct
1	Tonk	9.0	62.0	208.0	124.0	21.0
2	Malapura	38.0	205.0	176.0	191.0	20.0
3	Piploo	31.0	133.0	260.0	265.0	33.0
4	Niwai	48.0	251.0	308.0	42.0	48.0
5	Todaraisingh	22.0	148.0	221.0	100.0	8.0
6	Deoli	9.0	62.0	208.0	124.0	21.0
7	Aligarh	5.0	270	628.0	147.0	66.0
	Total Rainfall	**162.0**	**1131**	**2009**	**993**	**217**
	Av. Rainfall	**24.0**	**162.0**	**287.0**	**142.0**	**31.0**

Source: Water Resource Department, Rajasthan

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CHAPTER -10
GEOLOGY AND MINERAL WEALTH

11.0GEOLOGY AND MINERAL WEALTH:-

Tonk district covers an area of 7194 sq.km. falling in Survey of India degree sheets 45 N, O and 54 B, C.Major part of the district is a flat pedeplain occupied by rocks of Arechean in age mostly, under a thin soil cover. The rocks exposed in the district belongs to Bhilwara Super Group and Vindhyan Super Group mainly.The general trend of rock formation vary from N-S to NE-SW with steep westerly dips.

The Bhilwara Super Group (Arechean) is represented by the rocks of the Mangalwar Complex and the Hindoli Group.The rocks of the Mangalwar Complex are represented by migmatite, gneisses, schists, dolomite, calc silicate rock, quartzite, etc These rocks are intruded by granite, granodiorite related to Giyangath - Asind acidic rocks and amphibolite, norite, etc.

The rocks of Hindoli Group are juxtaposed with those of the Mangalwar Complex along a sheared contact. The Hindoli Group essentially consist of phyllite, slate. Metagraywacks with quartzite bands. These are intruded by sills and dyke of dolerite and granite (Jahazpur Granite). The lower proterozoic rock namely dolomite, banded iron formation, quartzite, belonging to the Jahazpur Group occurs in southern part of the district.

The lower Bhander sand stone and Sirbu shale formation belonging to the Bhander Group of Vindhyan Super Group occurs in extreme SE part bordering Sawaimadhopur and Kota district. Alluvium and Aeolian sand of quaternary age from part of the pedeplain.

Geological succession of Tonk district is tabulated below:

Alluvium	Bhander Group	Vindhyan Super Group	Quarter nary
Sirbu Shale			
Lower Bhander Sandstone Bundi Hills			Upper Proterozoic
Ummedpura ortho quartzite	Jahazpur	Bhilwara Super Group	Lower Proterozoic
Jawla dolomite with B/F			
Jahazpur granite/ Undifferrential granite	Intrusive		
Dolomite			
Sujanpura Garnetiferous phyllite	Hindoli Group		Archean
Metagraywack			
Bhadesar slate and phyllite ortho quartzite			
Norite, amphibolites	Giyangarh Asind acidic rock		
Granite gneiss, migmatite			
Rajmahal quartzite			

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Migmatite, gneiss, mica schist, dolomite, calc silicate, garnet-mica schist, quartzite	Mangalwar Complex		

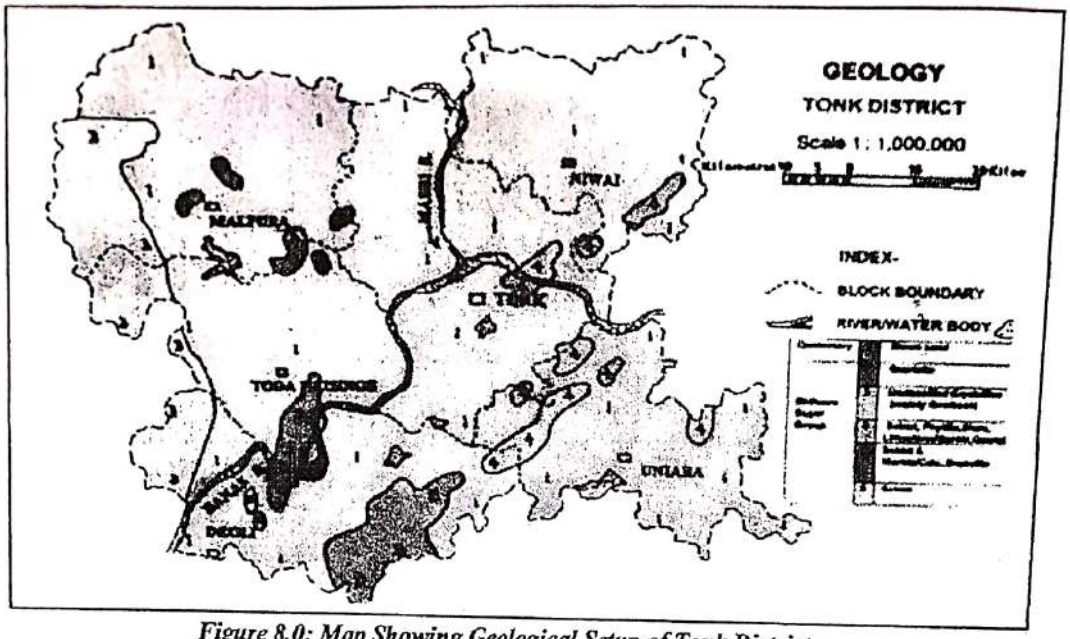

Figure 8.0: Map Showing Geological Setup of Tonk District

Mineral Resources:

Tonkdistrict is known for mineral potential,the district is the producer of are silica sand, mica, andcorundum, soapstone and Limestone/Dolomite, Marble, Asbestos (amphibole type), Soapstone, , Phyllite-schist, Pyrophilite, Andulastie,Garnet, mica, Granite, building-stones, Quartz, Feldspar and Bajri (sand).Mining areas encompass area under surface mining operations. The recognizable impacts of these activities on the landscape are unmistakable giant pit mines covering vast areas. The presence of water bodies does not necessarily imply inactive or unused extractive areas; ponds or lakes are often an integral part of an extractive operation. It includes surface rocks and stone quarries, sand and gravel pits, brick kilns, etc. These are areas of stockpile of storage dump of industrial raw material or slag/effluents or waste material or quarried/mixed debris from earth's surface. Total Mining areas cover about 3.04 sq km area in Tonk district which is 0.05 % of the entire area of the district.

Aquamarine:It is one of the semiprecious varieties of beryl with sea-green to greenish blue color and transparency. The occurrences of aquamarine are found from Todaraisingh, Bagri, Rampura, Jhonparia, Botunda, Tharel and Hamirpur areas. It is found within or at the contact of pegmatite with the schist.

Garnet:Tonk district enjoyed top position in the production of gem garnet. The almandine variety of gem garnet is found between Rajmahal and Kalayanpura through Bisalpur.the most

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promising area of garnet is around villages Rajmahal, Gaonri, Kushalpura, and Deokhera etc.The garnet is found in 11 km .strike length and is confined to chlorite-biotite-schist. Most of the garnet mines are not under operation due to dewatering problem and lack of abrasive industries in the nearby area to consume abrasive.

Ruby: Corundum occurrences (Gem ruby) have been known from only one locality in Tonk district near Juali village in Tonk Tehsil. The ruby corundum occurs a barrel or pyramidal shaped rounded crystals of 1 to 9 cm. size. It is found associated with the cordierite biotite corundum rock.

Silica sand: Silica sand occurrences are located around Bher, Siwad and Niwai. The estimated reserves are 6.05 mt. at Bahar and 28 m.t. at Niwai 3.8 mt. are expected to be of friable variety capable of yielding pure silica sand.

Mica: The mica pegmatite belt passes through part of the district between Devranand and Tonk. Mica occurs within pegmatite. Two important mica mines are located near Dholi and Jhopira near Phagi .

Andulastie: Occurrences of andulasite are found near Sitapura, Sardadrpura and Anwa villages. The mineral occurs in the form of elongated prismatic crystals within the mica schists. The width of mineralized zone is slightly below 60 mt. The aluminate content varies from 40-50% , which is slightly below the normal industrial requirement.

Soap stone: Soap Stone is located around village Rampura near Todaraisingh in 300 x 50 mt. area. The soap stone is of D.D.T. grade and falls in reserved forest.

Granite: Extensive granite gneisses are exposed in Malpura and Todaraisingh tehsil of district Tonk. Department of Mines & Geology has delineated the granite areas near village Ganwar, Dewal, Rupaheli, Rajpura, etc.

Limestone: Two limestone bands have been located near village Nawab Ganj, tehsil Uniara having strike length 400 mt. and about 1.00 km. To establish its grade and reserves, survey work is under progress.

Phyllite/Schist: Phyllite/ Schist occur is extending for about 12.5 km. length and 2.5 km width and located from Tonkrawas to Chandli via Anwa village . This phyllite is being used as decorative stone, are worked, extensively by local villages. These are being processed at Deoli, where from it is being mostly exported.

Splitable Sandstone: The splittabel sandstone is found in 3 x 1 km. area near village Amli, tehsil Uniara. The splits observed in the area have dimensions maximum upto 12 ft. in length and 3 ft. in width and 6 inches in thickness. It is reddish and pink in color and fine grained in nature. It is expected to take good polish and can be used as decorative stones.

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सत्यमेव जयते

SUSTAINABLE SAND MINING MANAGEMENT GUIDELINES 2016

पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय

इंदिरा पर्यावरण भवन, जोर बाग रोड, नई दिल्ली–110 003

Ministry of Environment, Forest and Climate Change

Indira Paryavaran Bhavan, Jor Bagh Road, New Delhi - 110 003

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Acknowledgment

The Sustainable Sand Mining Management Guidelines 2016, has been prepared after extensive consultation with the States and stakeholders over a period of last one year. The Guideline assimilates the knowledge and experience of stakeholder. The main objective of the Guidelines is to ensure sustainable sand mining and environment friendly management practices in order to restore and maintain the ecology of river and other sand sources. The team of the officers of Ministry of Environment, Forest and Climate Change who have worked for preparing these Guidelines comprised of following:

1. Shri Manoj Kumar Singh, Joint Secretary
2. Dr. U. Sridharan, Scientist 'F'
3. Dr. R.B. Lal, Scientist 'D'
4. Dr. Sonu Singh, Scientist 'D'

SUSTAINABLE SAND MINING MANAGEMENT GUIDELINES

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Prakash Javadekar

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राज्य मंत्री (स्वतंत्र प्रभार)
MINISTER OF STATE (INDEPENDENT CHARGE)
पर्यावरण, वन एवं जलवायु परिवर्तन
ENVIRONMENT, FOREST & CLIMATE CHANGE
भारत सरकार / GOVERNMENT OF INDIA

FOREWORD

Environmental Protection and Sustainable Development have been the cornerstones of the policies and procedures governing the industrial and other developmental activities in India. The Ministry of Environment, Forest and Climate Change has taken several policy initiatives and enacted environmental and pollution control legislations to prevent indiscriminate exploitation of natural resources and to promote integration of environmental concerns in developmental projects. One such initiative is the Notification on Environmental Impact Assessment (EIA) of developmental projects issued on 14th September, 2006 under the provisions of Environment (Protection) Act, 1986, making EIA mandatory for certain categories of developmental projects.

Another land mark decision has been taken with the new notifications dated 15.01.2016 and 20.01.2016 on mining of minor minerals and constitution of District Level Environment Impact Assessment Authority and District Level Environment Appraisal Committee. This will ensure environmentally sustainable mining especially for sand and gravel under close supervision of district authorities. Use of information technology and information technology enabled services for scientific monitoring of mining and transportation of mined out material is another important feature of above notification.

Sand and gravel are one of the most important construction materials. Ensuring their availability is vital for the development of the infrastructure in the country. There are different sources of sand and gravel, the most important among them is the river. As the requirement of these construction materials is on rise, they also are very vital for the health, physical character of the river and the different important functions of the river. The extraction of sand and gravel from the river bodies has to be regulated and done with adoption of required environmental safeguards.

In view of evolving scenario in industry and development sector, My Ministry has prepared a "Sustainable Sand Mining Management Guidelines". The Guidelines *inter-alia* focus on preparation of District Survey Report; Management Plan; Marine Sand Mining and Impact on Marine Biodiversity; Issues and Management of Mining in Cluster; Management of Sand Deposited after Flood on Agricultural Field of Farmers; Mining of Sand from Agricultural Field; Monitoring System for Sustainable Sand Mining using Information Technology System; Creation of District Level Environment Impact Assessment Authority (DEIAA) and District Level Expert Appraisal Committee (DEAC) for granting Environment Clearance for Mining of Minor Minerals; Exemption of certain cases for requirement of Environment Clearance and Standard Environmental Conditions for Sustainable Sand Mining.

The Guidelines will help the Departments of Mines and Geology, State Pollution Control Boards/Committees, Industries, Regulators, Authorities and various Stakeholders to ensure environmentally sustainable mining in the Country.

(Prakash Javadekar)

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अशोक लवासा
ASHOK LAVASA, IAS

सत्यमेव जयते

सचिव
भारत सरकार
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
Secretary
Government of India
Ministry of Environment, Forest and Climate Change

PREFACE

Sand is naturally occurring granular material composed of finely divided rock and mineral particles. Sand and gravel together known as aggregate, represent the highest volume of raw material used on earth. The mining of aggregate has been continuing for many years. Now the mining of aggregates has reached a level threatening the environment and ecosystem besides also reaching a level of scarcity that would threaten the economy. It is recommended that sand and aggregate mining, and quarrying should be done only after sound scientific assessment and adopting best practices to limit the impact on the environment.

The main objectives of the Guidelines, inter-alia, includes to ensure that sand and gravel mining is done in environmentally sustainable and socially responsible manner; availability of adequate quantity of aggregate in sustainable manner; improve the effectiveness of monitoring of mining and transportation of mined out material; conservation of the river equilibrium and its natural environment by protection and restoration of the ecological system; avoid aggradation at the *downstream* reach especially those with hydraulic structures such as jetties, water intakes etc.; to ensure the rivers are protected from bank and bed erosion beyond its stable profile; no obstruction to the river flow, water transport and restoring the riparian rights and in-stream habitats; to avoid pollution of river water leading to water quality deterioration; to prevent depletion of ground water reserves due to excessive draining out of ground water; and streamlining the process for grant of environmental clearance (EC) for sustainable mining.

The recommendations for management of sustainable sand extraction are the key objectives of the Guidelines. Emphasis is given to the setting up of monitoring plans that will provide data on profile changes and sediment transport capacity to enable the authorities to evaluate the long-term effect of the mining activities both upstream and downstream of sand extraction sites. Special emphasis is given on monitoring of the mined out material, which is key to the success of environment management plan. So use of IT and IT enabled services for effective monitoring of the quantity of mined out material and transportation along with process reengineering has been made a part of the Guideline. The Guidelines propose delegation of responsibility and authority to the cutting edge level i.e. the District Environment Impact Assessment Authority along with streamlining the process of impact assessment, environment management plan and environment clearance in cluster situation.

Lavasa
(Ashok Lavasa)

New Delhi
Date: 15-03-2016

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EXECUTIVE SUMMARY

The sand and gravel are one of the most important construction materials. Ensuring their availability is vital for the development of the infrastructure in the country. There are different sources of sand and gravel, the most important among them is the river. As the requirement of these construction materials is on rise, they also are very vital for the health, physical character of the river and the different important functions of the river. The extraction of sand and gravel from the river bodies has to be regulated and done with adoption of required environmental safeguards.

For making available these resources, a mapping of these resources at the district level, identification of appropriate sites for extraction, appraisal of the extraction process, putting in place the required environmental safeguards, and rigorous monitoring of the volume of extracted material is required to ensure sustainability of the entire process.

The district is the unit of administration which is best placed to do the mapping of these resources, adopt the best environmental practices for extraction of these materials and monitor its extraction and movement. The large number of leases which are awarded, the scattered geographical location of the availability of these materials and decentralized requirement and usage of the sand and aggregates also places districts in a unique position to play a vital role in adoption of environmental safeguards needed for sustainable extraction of river sand and gravel.

Recommendations for management of sustainable sand extraction are the key objective of the Guidelines. Emphasis is given to the setting up of monitoring plans that will provide data on profile changes and sediment transport capacity to enable the authorities to evaluate the long-term effect of the mining activities both upstream and downstream of sand extraction sites.

Special emphasis is given on monitoring of the mined out material, which is key to the success of environment management plan. So use of IT and IT enabled services for effective monitoring of the quantity of mined out material and transportation along with process reengineering has been made a part of the Guideliness. The Guidelines proposes delegation of responsibility and authority to the cutting edge level i.e. the District Environment Impact Assessment Authority along with streamlining the process of impact assessment, environment management plan and environment clearance in cluster situation.

Promotion of manufactured sand, artificial sand and alternative technologies in construction materials and processes are also required for reducing the dependence and demand on naturally occurring sand and gravel. Development of slag sand, sand from stone chips and there certification under BIS is an important step in this direction.

INTRODUCTION

Sustainable Development is built on three pillars - environmental, social and economic. Sustainable development cannot be achieved if the environment is protected but poverty is prevalent in a significant part of the population. Similarly, sustainable development cannot be achieved through inappropriate economic growth, if it undermines the environment in which people and businesses exists. These Guideliness support that fundamental concept, promoting environmental protection, limiting negative physiological, hydrological and social impacts under pinning sustainable economic growth.

Sand and gravel have long been used as aggregate for construction of roads and building. Today, the demand for these materials continues to rise. In India, the main sources of sand are river flood plain, coastal sand, paleo channel sand, and sand from agricultural fields.

River sand mining is a common practice as habitation concentrates along the rivers and the mining locations are preferred near the markets or along the transportation route, for reducing the transportation cost. River sand mining can damage private and public properties as well as aquatic habitats. Excessive removal of sand may significantly distort the natural equilibrium of a stream channel.

Removing sediment from the active channel bed in river interrupt the continuity of sediment transport through the river system, disrupting the sediment mass balance in the river downstream and induces channel adjustments (usually incision) extending considerable distances (commonly one kilometer or more) beyond the extraction site.

The magnitude of the impact basically depends on the magnitudes of the extraction relative to bed load sediment supply and transport through the reach. Implementation of the principles and processes outlined in this Guidelines will limit the negative externalities of sand and gravel mining.

NEED FOR POLICY GUIDELINES

Sand is naturally occurring granular material composed of finely divided rock and mineral particles between 150 micron to 4.75 mm in diameter (IS 383-1970). Sand is formed due to weathering of rocks due to mechanical forces. In the process the weathered rocks forms gravel and then sand.

Sand and gravel together known as aggregate, represent the highest volume of raw material used on earth after water. The mining of aggregate has been continuing for many years. Now the mining of aggregates has reached a level threatening the environment and ecosystem besides also reaching a level of scarcity that would threaten the economy. It is recommended that sand & aggregate mining, and quarrying should be done only after sound scientific assessment and adopting best practices to limit the impact on the environment.

It is also felt that the greater use of substitute material (Manufactured Sand, artificial sand etc.) & construction technology, and sustainable use of the resource could drastically reduce adverse impact of mining on the environment.

OBJECTIVE OF THE GUIDELINES

The Guideliness has been based on the following principles:

- Uncontrolled sand mining is not sustainable.
- Compliance with present and future legislation and regulations on the subject is mandatory and not voluntary.
- Each lease holder should be given the opportunity to self-regulate to the extent that it can demonstrate compliance with legislation and regulations.
- Where self- regulation fails to deliver compliance with legislation and regulations, increased formal enforcement and monitoring should be implemented with punitive measures applied in line with the legal framework.
- There is a need to protect the environment and the right of the population to live in clean and safe surroundings, with the need to use natural resources in a way that will make a positive and sustainable contribution to the economy.

The main objectives of the Guidelines

- To ensure that sand and gravel mining is done in environmentally sustainable and socially responsible manner.
- To ensure availability of adequate quantity of aggregate in sustainable manner.
- To improve the effectiveness of monitoring of mining and transportation of mined out material.

- Ensure conservation of the river equilibrium and its natural environment by protection and restoration of the ecological system.
- Avoid aggradation at the downstream reach especially those with hydraulic structures such as jetties, water intakes etc.
- Ensure that the rivers are protected from bank and bed erosion beyond its stable profile.
- No obstruction to the river flow, water transport and restoring the riparian rights and in-stream habitats.
- Avoid pollution of river water leading to water quality deterioration.
- To prevent depletion of ground water reserves due to excessive draining out of ground water.
- To prevent ground water pollution by prohibiting sand mining on fissures where it works as filter prior to ground water recharge.
- To maintain the river equilibrium with the application of sediment transport principles in determining the locations, period and quantity to be extracted.
- Streamlining and simplifying the process for grant of environmental clearance (EC) for sustainable mining.

THE EFFECT OF SAND AND GRAVEL MINING

Mining within or near riverbed has a direct impact on the stream's physical characteristics, such as channel geometry, bed elevation, substratum composition and stability, in-stream roughness of the bed, flow velocity, discharge capacity, sediment transport capacity, turbidity, temperature etc. Alteration or modification of the above attributes may cause hazardous impact on ecological equilibrium of riverine regime. This may also cause adverse impact on in-stream biota and riparian habitats. This disturbance may also cause changes in channel configuration and flow-paths.

The effects of sand and gravel mining are as follows:

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) In-stream habitat is impacted by increase in river gradient, suspended load, sediment transport and sediment deposition. Excessive sediment deposition for replenishment increases turbidity which prevents penetration of light required for photosynthesis and reduces food availability of aquatic fauna.

c) Riparian habitat including vegetative cover on and adjacent to the river banks it controls erosion, provide nutrient inputs into the stream and prevents intrusion of pollutants in the stream through runoff. Bank erosion and change of morphology of the river can destroy the riparian vegetative cover.

d) Bed degradation are responsible for channel shifting, causing loss of properties and degradation of landscape, it can also undermine bridge supports, pipe lines or other structures.

e) Degradation may change the morphology of the river bed, which constitutes one aspect of the aquatic habitat.

f) 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. Lowering of ground water table in the flood plain because of lowering of riverbed level as well as river water level takes place because of extraction and draining out of excessive ground water from the adjacent areas. So, if a floodplain aquifer drains to the stream, groundwater levels can be lowered as a result of bed degradation.

g) Lowering of the water table can destroy riparian vegetation.

h) Excessive pumping of ground water in the process of mining in abandoned channels depletes ground water causing scarcity of irrigation and drinking water. In extreme cases it may create ground fissures and subsidence in adjacent areas.

i) 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.

j) The supply of overbank sediments to floodplains is reduced as flood heights decrease.

k) An un-scientific and unregulated sand and gravel mining tends to increase channel bank

scouring and erosion. This causes a large degree of meandering of rivers and sometimes it could be in kms.

l) Rapid bed degradation may induce bank collapse and erosion by increasing the heights of banks.

m) Polluting ground water by reducing the thickness of the filter material especially if mining is taking place at top of recharge fissures.

n) Choking of sand layer which acts as filter for ingress of ground water from river by dumping of finer material, compaction of filter zone due to movement of heavy vehicles. It also reduces the permeability and porosity of the filter material.

o) 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.

p) Ecological effects on bird nesting, fish migration, angling, etc.

q) Indiscrete mining activities lead to increased concentration of suspended sediment in the river which in turn causes siltation of water resources projects.

r) Un-scientific and unregulated sand and gravel mining leads to the severe health hazards like air quality degradation and dust fog.

s) Direct destruction from heavy equipment operation; discharges from equipment and refueling.

t) Biosecurity and pest risks.

u) Impacts on coastal processes.

The other deleterious impacts of indiscrete mining include

Loss of riparian habitat resulting from direct removal of vegetation along the stream bank to facilitate the use of a dragline or through the process of lowering the water table, bank undercutting, and channel incision. The physical composition and stability of substrates are altered as a result of in-stream mining and most of these physical effects may exacerbate sediment entrainment in the channel.

Furthermore, the process of in-stream mining and gravel washing produces fine sediments under all flow conditions, resulting in a deposition of fine sediment in riffles as well as other habitats at low discharge. Excess sediment is considered the greatest pollutant in waters and constitutes one of the major environmental factors in the degradation of stream fisheries.

However, in-stream mining may contribute additional sediment to downstream reaches due to the disruption of substrate stability. Once sediment enters the stream, it is best to let natural geomorphological and hydrological processes reach a dynamic equilibrium, rather than further exacerbating the situation by additional disturbance.

All other things being equal:

a) Extracting gravel from an excavation that does not penetrate the water table and is located away from an active stream channel should cause little or no change to the natural hydrological processes unless the stream captures the pit during periods of flooding.

b) In-stream extraction of gravel from below the water level of a stream generally causes more changes to the natural hydrologic processes than limiting extraction to a reference point above the water level.

c) In-stream extraction of gravel below the deepest part of the channel (the thalweg) generally causes more changes to the natural hydrological processes than limiting extraction to a reference point above the thalweg.

d) Excavating sand and gravel from a small straight channel with a narrow floodplain generally will have a greater impact on the natural hydrological processes than excavations on a braided channel with a wide floodplain.

e) Extracting sand and gravel from a large river or stream will generally create less impact than extracting the same amount of material from a smaller river or stream.

f) Over-extraction of gravel can destabilise channels and banks, and/or affect the ecologic functioning of rivers particularly if undertaken at the wrong time, or in the wrong place, or in a way that damages the river bed or margins.

GENERAL APPROACH TO SUSTAINABLE SAND AND GRAVEL MINING

Following considerations should be kept in mind for sand / gravel mining:

a) Parts of the river reach that experience deposition or aggradation shall be identified first. The Lease holder/ Environmental Clearance holder may be allowed to extract the sand and gravel deposit in these locations to manage aggradation problem.

b) The distance between sites for sand and gravel mining shall depend on the replenishment rate of the river. Sediment rating curve for the potential sites shall be developed and checked against the extracted volumes of sand and gravel.

c) Sand and gravel may be extracted across the entire active channel during the dry season.

d) Abandoned stream channels on terrace and inactive floodplains be preferred rather than active channels and their deltas and flood plains. Stream should not be diverted to form inactive channel.

e) Layers of sand and gravel which could be removed from the river bed shall depend on the width of the river and replenishment rate of the river.

f) Sand and gravel shall not be allowed to be extracted where erosion may occur, such as at the concave bank.

g) Segments of braided river system should be used preferably falling within the lateral migration area of the river regime that enhances the feasibility of sediment replenishment.

h) Sand and gravel shall not be extracted within 200 to 500 meter from any crucial hydraulic structure such as pumping station, water intakes, and bridges. The exact distance should be ascertained by the local authorities based on local situation. The cross-section survey should cover a minimum distance of 1.0 km upstream and 1.0 km downstream of the potential reach for extraction. The sediment sampling should include the bed material and bed material load before, during and after extraction period. Develop a sediment rating curve at the upstream end of the potential reach using the surveyed cross- section. Using the historical or gauged flow rating curve, determine the suitable period of high flow that can replenish the extracted volume. Calculate the extraction volume based on the sediment rating curve and high flow period after determining the allowable mining depth.

i) Sand and gravel could be extracted from the downstream of the sand bar at river bends. Retaining the upstream one to two thirds of the bar and riparian vegetation is accepted as a method to promote channel stability.

j) Flood discharge capacity of the river could be maintained in areas where there are significant flood hazard to existing structures or infrastructure. Sand and gravel mining may be allowed to maintain the natural flow capacity based on surveyed cross- section history.

k) Alternatively, off-channel or floodplain extraction is recommended to allow rivers to replenish the quantity taken out during mining.

l) The Piedmont Zone (Bhabhar area) particularly in the Himalayan foothills, where riverbed material is mined, this sandy-gravelly track constitutes excellent conduits and holds the greater potential for ground water recharge. Mining in such areas should be preferred in locations selected away from the channel bank stretches.

m) Mining depth should be restricted to 3 meter and distance from the bank should be 3 meter or 10 percent of the river width whichever less.

n) The borrow area should preferably be located on the river side of the proposed embankment, because they get silted up in course of time. For low embankment less than 6 m in height, borrow area should not be selected within 25 m from the toe/heel of the embankment. In case of higher embankment the distance should not be less than 50 m. In order to obviate development of flow parallel to embankment, cross bars of width eight times the depth of borrow pits spaced 50 to 60 meters centre-to-centre should be left in the borrow pits.

o) Demarcation of mining area with pillars and geo-referencing should be done prior to start of mining.

THE WORLD SCENARIO

Sand and gravel are mined world-wide and account for the largest volume of solid material extracted globally. Formed by erosive processes over thousands of years, they are now being extracted at a rate far greater than their renewal. Furthermore, the volume being extracted is having a major impact on rivers, deltas and coastal and marine ecosystems, resulting in loss of land through river or coastal erosion, lowering of the water table and decrease in the amount of sediment supply. Despite the colossal quantities of sand and gravel being used, increasing dependence on them and the significant impact that their extraction has on the environment, this issue needs far better attention and awareness.

Globally, between 47 and 59 billion tonnes of material is mined every year of which sand and gravel, known as aggregates, account for both the largest share (from 68% to 85%) and the fastest growth in extraction increase. Although more sand and gravel are mined than any other material, reliable data on their extraction is not available. The absence of global data on aggregates mining makes environmental assessment very difficult and has contributed to the lack of awareness about this issue. One way to estimate the global use of aggregates indirectly is through the production of cement for concrete (concrete is made with cement, water, sand and gravel). The production of cement is reported by 150 countries and it reached 3.7 billion tonnes in 2012 (USGS, 2013a). For each tonne of cement, the building industry needs about six to seven times more tonnes of sand and gravel (USGS, 2013b). Thus, the world's use of aggregates for concrete can be estimated at 25.9 billion tonnes a year for 2012 alone.

Added to this are all the aggregates used in land reclamation, shoreline developments and road embankments (for which the global statistics are unavailable), added to this is the 180 million tonnes of sand used in industry (USGS, 2012). Aggregates also contribute to 90% of asphalt pavements and 80% of concrete roads (Robinson and Brown, 2002). Taking all these estimates into account, a conservative estimate for the world consumption of aggregates exceeds 40 billion tonnes a year.

This large quantity of material cannot be extracted and used without a significant impact on the environment. Extraction has an impact on biodiversity, water turbidity, water table levels and landscape and on climate through carbon dioxide emissions from transportation. There are also socio-economic, cultural and even political consequences. In some extreme cases, the mining of marine aggregates has changed international boundaries, such as through the disappearance of sand islands in Indonesia (New York Times, 2010; Guerin, 2003).

The impacts of sand mining can be mainly categorized as follows:

IMPACTS ON	DESCRIPTION
Biodiversity	Impacts on related ecosystems (for example; fisheries)
Land losses	Both inland and coastal through erosion
Hydrological functions	Change in water flows, flood regulation and marine currents
Water supply	Through lowering of the water table and pollution
Infrastructures	Damage to bridges, river embankments and coastal infrastructures
Climate	Directly through transport emissions
Landscape	Coastal erosion, changes in deltaic structures, quarries, pollution of rivers
Extreme events	Decline of protection against extreme events (flood, drought, storm surge)

World over sand was until recently extracted in land quarries and riverbeds; however, a shift to marine and coastal aggregates mining has occurred due to the decline of inland resources. River and marine aggregates remain the main sources for building and land reclamation. For concrete, in-stream gravel requires less processing and produces high-quality material while marine aggregate needs to be thoroughly washed to remove salt. If the chloride is not removed from marine aggregate, a structure built with it might collapse after few decades due to corrosion of steel reinforced structures. Most sand from deserts cannot be used for concrete and land reclaiming, as the wind erosion process forms round grains that do not bind well.

INDIAN SCENARIO

The data on consumption of sand and aggregate in country is not available with any source. It can be derived indirectly from the usage of cement, construction of roads and stowing of mines. The trend for aggregates extraction can be estimated using cement production as a proxy.

Cement production has multiplied three-fold in the last 20 years from 1.37 billion tonnes of cement in 1994 to 3.7 billion tonnes in 2012 (USGS, 2013a) mainly as a result of rapid economic growth in Asia (UNEP and CSIRO, 2011). Five countries: China (58%), India (6.75%), the United States (2%), Brazil and Turkey - produce 70% of the world's cement (USGS, 2013c). The consumption of cement is expected to reach 324 million tonnes, which equates to use of 2.2 billion tonnes of aggregates. This is in addition to sand and aggregates used in stowing of mines, industry and other allied usage.

In India the main sources of sand are:

(a) River (riverbed and flood plain).

(b) Lakes and reservoirs.

(c) Agricultural fields (Haryana).

(d) Coastal / marine sand.

(e) Palaeo-channels (Bikaner in Rajasthan).

THE PRICE ELASTICITY FOR DEMAND OF SAND

As the price elasticity of demand for sand is inelastic (-0.88), any increase in price in absence of marketable alternative will not have any significant impact on demand. Use of crushed stones or other substitute material should be promoted. The regional context of aggregate resources, market demand, and the environmental impacts of various alternatives must be understood before any site-specific proposal for aggregate extraction can be reviewed.

Evaluation of aggregate supply and demand should be undertaken on the basis of production-consumption regions, encompassing the market for aggregate and all potential sources of aggregate within an economical transport distance. The finite nature of high-quality alluvial gravel resources must be recognized, and high-quality PCC-grade aggregates should be reserved only for the uses demanding this quality material (such as concrete). Alternative sources should be used in less demanding applications (such as road sub-base). Part replacement with fly ash in roads and embankments be promoted in place of sand and aggregates.

The environmental costs of sand mining should be incorporated into the price of the product so that alternative sources that require more processing but have less environmental impact become more attractive.

PROCESS OF SEDIMENT TRANSPORT

The loose boundary (consisting of movable material) of an alluvial channel deforms under the action of flowing water and the deformed bed with its changing roughness (bed forms) interacts with the flow. The resulting movement of the bed material (sediment) in the direction of flow is called sediment transport and a critical bed shear stress must be exceeded to start the particle movement.

Such a critical shear stress is referred as incipient (threshold) motion condition, below which the particles will be at rest and the flow is similar to that on a rigid boundary. Some sediment particles roll or slide along the bed intermittently and some others saltate (hopping or bouncing along the bed). The material transported in one or both of these modes is called 'bed load'.

Finer particles (with low fall velocities) are entrained in suspension by the fluid turbulence and transported along the channel in suspension. This mode of transport is called 'suspended load'. Sometimes finer particles from upland catchment (sizes which are not present in the bed material), called 'wash load', are also transported in suspension. The combined bed material and wash load is called 'total load'.

Bed load ranges from a few percent of total load in lowland rivers to perhaps 15% in Mountain Rivers to over 60% in some arid catchments. Although a relatively small part of the total sediment load, the arrangement of bed load sediment constitutes the architecture of sand, and gravel-bed channels.

The rate of sediment transport typically increases as a power function of flow; that is, a doubling of flow typically produces more than a doubling in sediment transport and most sediment transport occurs during floods. The environmental impacts from in-stream mining can be avoided, if the annual bed load is calculated and aggregate extraction is restricted to that value or some portion of it. To accurately limit extraction to some portion of bed load, the amount of sediment that passes the in-stream mining site during a given period of time must be calculated.

There is a large amount of uncertainty in the process of calculating annual rates of bed load transport. How much coarse material is moved, how long it remains in motion as also how far it moves depends on the size, shape & packing of the material and the characteristics of the river flow.

Downstream movement commonly occurs as irregular bursts of short-distance movement separated by longer periods, when the particles remain at rest. Because bed load changes from hour-to-hour, day-to-day, and year-to-year, estimating annual bed load rates is a dynamic process involving careful examination.

Constant variations in the flow of the river make the channel floor and riverbanks a dynamic interface, where some materials are being eroded while others are being deposited. The net balance of this activity, on a short- term basis, is referred to as scour or fill.

On a long-term basis, continued scour results in erosion (degradation), while continued fill results in deposition (aggradation).

A general indicator of the stability of a stream relates to the amount of vegetation present. Gravel bars that are vegetated or where the gravel is tightly packed, generally indicate streams, where the gravel supply is in balance. Streams with excessive gravel generally have gravel bars with little or no vegetation, and are surfaced with loosely packed gravel.

SUSTAINABLE SAND AND GRAVEL MINING GUIDELINES

The broad principle on which any sustainable sand mining Guidelines / policy can be based is that river/ natural resources must be utilized for the benefit of the present and future generation, so river resources should be prudently managed and developed. The preparation of District Survery Report is an important initial step.

The Processes under the Guidelines:

(a) Identification of areas of aggradation / deposition where mining can be allowed; and identification of areas of erosion and proximity to infrastructural structures and installations where mining should be prohibited. Use of satellite imagery for identifying areas of sand deposit and quantity be done.

(b) Calculation of annual rate of replenishment and allowing time for replenishment after mining in area.

(c) Identifying ways of scientific and systematic mining.

(d) Identifying measures for protection of environment and ecology.

(e) Determining measures for protection of bank erosion.

(f) A bench mark (BM) with respect to mean sea level (MSL) should be made essential to in-mining channel reaches (MCR). Below which no mining shall be allowed.

(g) Identifying steps for conservation of mineral.

(h) Permanent gauging facilities (for discharge and sediment both) should be made compulsory for the sites having excessive mining in consultation with Central Water Commission or any competent State Agency.

(i) Implementing safeguards for checking illegal and indiscrete mining.

Following the above processes, to begin with it is important to prepare a survey document mapping the status of sand sources in a district. This survey should be conducted and report be prepared for each district. Though it is an acceptable fact that rivers cut across districts and States and every river is an ecosystem in itself. But, keeping in view the fact that the district is the most established unit of administration at which this kind of survey, planning and monitoring can be ensured effectively, it is proposed that every district will prepare this document taking the river stretch in that district as an ecological unit and inventorising other sources of sand in the district.

Besides, the production of aggregate in a particular area is a function of availability of natural resources, the size of the population, the economy of the area and various developmental and infrastructural works being undertaken in the area.

The natural resources must be utilized in environment friendly manner in scientific and systematic way and with the objective of sustainable development the policy on the subject should have provisions for protection of environment & ecology. These factors can be accounted for in a most efficient manner at district level.

The sustainable mining plan needs to be dynamic. A survey should be carried out by the District Environment Impact Assessment Authority (DEIAA) with the assistance of Geology Department, Irrigation Department, Forest Department, Public Works Department, Ground Water Boards, Remote Sensing Department and Mining Department etc. in the district at regular intervals.

The survey shall contain:

1. District wise detail of river or stream and other sand source.
2. District wise availability of sand or gravel or aggregate resources.
3. District wise detail of existing mining leases of sand and aggregates.

Based on this survey document, the action plan shall divide the river/ stream/ other sources of the District into the following categories:

1. River / Stream beds sections / other sources suitable for extraction of sand and aggregates.
2. River / Stream beds sections / other sources prohibited for extraction of sand and aggregates.

The river/ streams/ other sources of sand and aggregate are studied on following parameters:

a) Geomorphological studies

i) Place of origin
ii) Catchment area.
iii) General profile of river stream.
iv) Annual deposition factor.
v) Replenishment.
vi) Total potential of minor mineral in the river bed.

b) Geological studies

i) Lithology of catchment area.
ii) Tectonics and structural behavior of rocks.

c) Climatic Factors

i) Intensity of rainfall.
ii) Climate Zone.
iii) Temperature variation

The following points to be considered while selecting the river / stream for mining besides the above parameters:

i) A stable river is able to constantly transport the flow of sediments produced by watershed such that it's dimensions (width and depth) pattern and vertical profile are maintained without aggrading (building up) or degrading (scouring down).

ii) The amount of boulders, cobbles, pebbles, and sand deposited in river bed equals to the amount delivered to the river from catchment area and from bank erosion minus amount transported downstream each year.

iii) It is compulsive nature of river to meander in their beds and therefore they will have to be provided with adequate corridor for meandering without hindrance. Any attempt to diminish the width of the corridor (floodway) and curb the freedom to meander would prove counterproductive.

iv) Erosion and deposition is law of nature. The river stream has to complete its geomorphological cycles from youth, mature to old age.

v) River capturing is unavoidable.

vi) Fundamentally the lowest point of any stream is fixed by sea level.

This survey document should be prepared in the district based on direct and indirect benefits of mining and identification of the potential threats to the river / stream beds in the district.

Besides, calculating the carrying capacity of the river / stream beds / other sources to find out maximum quantity available to be allowed for removal each year from the sources, it should also provide various measures to regulate sand and aggregate mining in a systemic way.

It has to provide for environmentally safe depth of mining and safeguards of banks by prescribing safe distance from banks. It is required that there should be a Sub-Divisional Committee which should visit each site and make recommendation. The Committee should comprise of Sub-Divisional Magistrate, Officers from Irrigation department, State Pollution Control Board or Committee, Forest department, Geology or mining officer shall visit each site for which environmental clearance has been applied for and make recommendation on suitability of site for mining or prohibition thereof.

THE STRUCTURE OF DISTRICT SURVEY REPORT

The report can have following structure:

1. Introduction
2. Overview of Mining Activity in the District
3 The List of Mining Leases in the District with location, area and period of validity
4. Details of Royalty or Revenue received in last three years
5. Detail of Production of Sand or Bajari or minor mineral in last three years
6. Process of Deposition of Sediments in the rivers of the District
7. General Profile of the District
8. Land Utilization Pattern in the district: Forest, Agriculture, Horticulture, Mining etc.
9. Physiography of the District
10. Rainfall: month-wise
11. Geology and Mineral Wealth

12. Drainage System with description of main rivers.

Sl.No.	NAME OF RIVER	AREA DRAINED (Sq. Km)	% AREA DRAINED

13. Salient Features of Important Rivers and Streams:

Sl.No.	Name of the River / Stream	Total Length in the District (in Km)	Place of origin	Altitude at Origin

14. Methodology Adopted for Calculating of Mineral Potential

The mineral potential is calculated based on field investigation and geology of the catchment area of the river/ streams. As per the policy of the State and location, depth of minable mineral is defined. The area for removal of mineral in a river or stream can be decided depending on geo-morphology

and other factors, it can be 50% to 60% of the area of a particular river/stream, e.g. in Himachal Pradesh mineral constituents like boulders, river born bajari, sand up to a depth of one meter are considered as resource mineral. Other constituents like clay and silt are excluded as waste while calculating the mineral potential of particular river/ stream.

The specific gravity of each mineral constituent is different. While calculating the mineral potential, the average specific gravity is taken as 2.25. The percent of mineral constituent like boulder, river bajari, sand also varies for different river and streams. While calculating the mineral potential the percentage of each mineral constituent is taken as, Boulders 35-40%, Bajari - 30-35%, Sand 25-30% and 5-10% for silt and clay.

The quantum of deposition varies from stream to stream depending upon factors like catchment lithology, discharge, river profile and geomorphology of the river course. There are certain geomorphological features developed in the river beds such as channel bar, point bar etc. where annual deposition is more even two to three meters.

For illustration one example of Yamuna River in Sirmaour district of Himachal Pradesh is given below:

Portion of the River / 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 metric tonne) (60% of total mineral potential)
From Downstream of confluence with Tons River to Behral near Haryana and Uttar Pradesh border	31	478	14818000	16803612

Note: Considering the density of river bed material to be **1.89 g/cm^3**

Present Status of Mining

This gives the detail of mining leases already in operation in this stretch, area and production in last three years from these leases is calculated.

Mineral Potential is calculated in following way:

Mineral Potential

Boulder (MT)	Bajari (MT)	Sand (MT)	Total Mineable Mineral Potential (MT)
5601204	6801462	4400946	16803612

Annual Deposition

336072	408088	264057	1008217

Recommendation:

From the above it is clear that about 16803612 metric tonnes of mineral is available up to depth of one meter in the river bed of Yamuna in Sirmour district.
The annual deposition is 1008217 MT.
The average annual production is 80000 MT.
So, 16723612 MT of mineral can be safely removed.

In similar manner it should be calculated for each river and stream in the district and compiled in following format:

Sl.No.	River/ Stream	Portion of the river / stream recommended for mineral concession	Length of the recommended area for mineral concession (in kilometer)	Average width of the recommended area for mineral concession (in meters)	Area recommended for mineral concession (in sq.mtrs.)	Mineable mineral potential (in metric tonne) (60% of total mineral potential)
Total for the District						

About the size of the mining leases for the aggregates it should be borne in mind that a river / stream can be divided into two zones, which in-turn is dynamic i.e. the zone of erosion and

zone of deposition. These zones of deposition and erosion are extended in different patches in the river.

Any mining lease granted in larger tract can cover both the zones, and mining activity in zone of erosion can further aggravate the problem of erosion and as such the mining activity can be allowed only in the zone of the deposition. The mining leases of larger areas in rivers are neither in interest of environment nor in the interest of mineral conservation.

In Himalayan states the rivers and wasteland has been mostly classed as forest land and mining on that requires diversion of forest land and payment of compensatory afforestation and NPV etc. The land in river beds in hilly tracts and many small rivers at any one site seldom exceed 5 hectare, so not allowing sand mining leases less than 5 hectare on river beds further aggravates the situation. So the size of mining lease for river sand mining should be determined by the State as per the local situation.

MANAGEMENT PLAN

1. River Bed Mining Recommendations:

a) Permit Mining Volume Based on Measured Annual Replenishment

In the first year following adoption of the management plan, a volume equal to the estimated annual replenishment could be extracted from the reach of channel. Replenishment (up to the elevation of the selected channel configuration) would need to occur before subsequent extraction could take place. The concept of annual replenishment accounts for the episodic nature of sediment transport. For example, during wet periods with high stream flows, and a high contribution of sediment from hill slopes and tributaries, monitoring data would show that sand and gravel bars are replenished quickly. During drought periods with low stream flow, and little sediment supply or transport, monitoring data would likely show that bars were replenished at a slower rate.

The use of monitoring data is essential in measuring when actual replenishment occurs. The use of the concept of annual replenishment protects long-term channel stability as well as aquatic and riparian habitat by extracting a volume sustainable by watershed processes.

b) Establish an Absolute Elevation below Which No Extraction May Occur (Minimum Enveloped Level or Redline).

The absolute elevation below which no mining could occur or "redline" would be surveyed on a site-specific basis in order to avoid impacts to structures such as bridges and to avoid vegetation impacts associated with down-cutting due to excessive removal of sediment. An extraction site can be determined after setting the deposition level at 1 m above natural channel thalweg elevation, as determined by the survey approved by mine plan approving authority.

c) Limit River Bed Extraction Methods to Bar Skimming

If mining is limited to the downstream end of the bar with a riparian buffer on both the channel and hill slope (or floodplain) side, bar skimming would minimise impacts. Other methods such as excavation of trenches or pools in the low flow channel lower the local base level, and maximise upstream (head cutting and incision) and downstream (widening and braiding) impacts. In addition, direct disturbance of the substrate in the low flow channel should be avoided. Trenching on bars may be beneficial in the future if the river becomes severely aggraded, flat, shallow and braided. Trenching of bars may initially impact a smaller area of riparian habitat than skimming - as a result of excavating deeper rather than shallow skimming of a large area. However, over the

long-term, the upstream and downstream effects of a trench on the bar or in the channel may offset any short-term benefit derived from this method.

d) Extract Sand and Gravel from the Downstream Portion of the Bar:

Retaining the upstream one to two thirds of the bar and riparian vegetation while excavating from the downstream one to two third of the bar is accepted as a method to promote channel stability and protect the narrow width of the low flow channel necessary for aquatic life. Sand and gravel would be re-deposited in the excavated downstream one to two thirds of the bar (or downstream of the widest point of the bar) where an eddy would form during sediment transporting flows. In contrast, if excavation occurs on the entire bar after removing existing riparian vegetation, there is a greater potential for widening and braiding of the low flow channel.

e) Concentrate Activities to Minimise Disturbance:

River bed extraction activities should be concentrated or localised to a few bars rather than spread out over many bars. This localisation of extraction will minimise the area of disturbance of upstream and downstream effects. Skimming decreases habitat and species diversity - these effects should not be expanded over a large portion of the area.

f) Review Cumulative Effects of Sand and Gravel Extraction:

The cumulative impact of all mining proposals should be reviewed on an annual basis to determine if cumulative riverine effects or effects to the estuary are likely.

g) Maintain Flood Capacity:

Flood capacity in the river should be maintained in areas where there are significant flood hazards to existing structures or infrastructure.

h) Establish a Long-term Monitoring Program:

Monitoring of changes in bed elevation and channel morphology, and aquatic and riparian habitat upstream and downstream of the extraction would identify any impacts of sand and gravel extraction to biologic resources. Long-term data collected over a period of decades as sand and gravel extraction occurs will provide data to use in determining trends.

i) Minimise Activities That Release Fine Sediment to the River:

No washing, crushing, screening, stockpiling, or plant operations should occur at or below the streams "average high water elevation," or the dominant discharge. These and similar activities have the potential to release fine sediments into the stream, providing habitat conditions harmful to local fish.

j) Retain Vegetation Buffer at Edge of Water and Against River Bank:

Riparian vegetation performs several functions essential to the proper maintenance of geomorphic and biological processes in rivers. It shields river banks and bars from erosion. Additionally, riparian vegetation, including roots and downed trees, serves as cover for fish, provides food source, works as a filter against sediment inputs, and aids in nutrient cycling. More broadly, the riparian zone is necessary to the integrity of the ecosystem providing habitat for invertebrates, birds and other wildlife.

k) The River Bed mining should only be allowed during the dry season.

No River bed mining should be permitted during rainy season (see Appendix 9).

l) An Annual Status and Trends Report:

This report should review permitted extraction quantities in light of results of the monitoring program, or as improved estimates of replenishment become available. The report should document changes in bed elevation, channel morphology, and aquatic and riparian habitat. The report should also include a record of extraction volumes permitted, and excavation location. Finally, recommendations for reclamation, if needed should be documented.

2. Off-Channel or Floodplain Extraction Recommendations

a) Floodplain Extraction should be set back from the Main Channel

In a dynamic alluvial system, it is not uncommon for meanders to migrate across a floodplain. In areas where sand and gravel occurs on floodplains or terraces, there is a potential for the river channel to migrate toward the pit. If the river erodes through the area left between the excavated pit and the river, there is a potential for "river capture," a situation where the low flow channel is diverted though the pit. In order to avoid river capture, excavation pits should set back from the river to provide a buffer, and should be designed to withstand the 100-year flood (100-year ARI). Adequate buffer widths and reduced pit slope gradients are preferred over engineered structures which require maintenance in perpetuity. Hydraulic, geomorphic, and geotechnical studies should be conducted prior to design and construction of the pit and bund. In addition to river capture, extraction pits create the possibility of stranding fish.

b) The maximum depth of Floodplain Extraction should remain above the Channel Thalweg

Floodplain pits should not be excavated below the elevation of the thalweg in the adjacent channel. This will minimise the impacts of potential river capture by limiting the potential for head cutting and the potential of the pit to trap sediment. A shallow excavation (above the water table) would provide a depression that would fill with

water part of the year, and develop seasonal wetland habitat. An excavation below the water table would provide deep water habitat.

c) Side Slopes of Floodplain Excavation Should Range from 3:1 to 10:1

Side slopes of a floodplain pit should be graded to a slope that ranges from 3:1 to 10:1. This will allow for a range of vegetation from wetland to upland. Steep side slopes excavated in floodplain pits on other systems have not been successfully reclaimed, since it is difficult for vegetation to become stabilised. Terrace pits should be designed with a large percentage of edge habitat with a low gradient which will naturally sustain vegetation at a variety of water levels.

d) Place Stockpiled Topsoil above the 25-year Return Period or ARI Level

Stockpiled topsoil can introduce a large supply of fines to the river during a flood event and degrade fish habitat. Storage above the 25-year flood (25-year ARI) inundation level is sufficient to minimise this risk.

e) Floodplain Pits Should Be Restored to Wetland Habitat or Reclaimed for Agriculture

The key to successful restoration or reclamation is to conserve or import adequate material to re-fill the pit, while ensuring that pit margins are graded to allow for development of significant wetland and emergent vegetation.

f) Establish a Long-term Monitoring Program

A long-term monitoring program should provide data illustrating any impacts to river stability, groundwater, fisheries, and riparian vegetation. The monitoring program should assess the success of any reclamation or restoration attempted.

g) An Annual Status and Trends Report

The status and trends report described previously should include a section on the hydrologic and biologic components of floodplain pit reclamation.

3. Extraction Methods

The important methods of sand and gravel mining operations are as below:

a) **Bar scalping or skimming** is extraction of sand and gravel from the surface of bars. This method generally requires that surface irregularities be smoothed out and that the extracted material be limited to what could be taken above an imaginary line sloping upwards and away from the water from a specified level above the river's water surface at the time of extraction (typically 0.3 - 0.6 m (1-2 ft). Bar scalping is commonly repeated year after year. To maintain the hydraulic control provided to upstream by the Riffle head, the preferred method of bar scalping is now generally to leave the top one-third (approximately) of the bar undisturbed, mining only from the downstream two-

thirds.

b) Dry-Pit Channel Mining

Dry-pit channel mines are pits excavated within the active channel on dry intermittent or ephemeral stream beds. Dry pits are often left with abrupt upstream margins, from which head cuts are likely to propagate upstream.

c) Wet-Pit Channel Mining

Wet-pit mining involves excavation of a pit in the active channel below the surface water in a perennial stream or below the alluvial groundwater table.

d) Bar Excavation

A pit is excavated at the downstream end of the bar as a source of aggregate and as a site to trap sand and gravel. Upon completion, the pit may be connected to the channel at its downstream end to provide side channel habitat.

e) Channel-wide River bed Mining

In rivers with a highly variable flow regime, sand and gravel are commonly extracted across the entire active channel during the dry season. The bed is evened out and uniformly (or nearly so) lowered.

4. Reclamation Plans

Reclamation plans should include:

a) A baseline survey consisting of existing condition cross-section data: Cross-sections must be surveyed between two documented endpoints set back from the top of bank, and elevations should be referenced to bench mark;

b) The proposed mining cross-section data should be plotted over the baseline data to illustrate the vertical extent of the proposed excavation;

c) The cross-section of the replenished bar should be the same as the baseline data. This illustrates that the bar elevation after the bar is replenished will be the same as the bar before extraction;

d) A planimetric map showing the aerial extent of the excavation and extent of the riparian buffers;

e) A planting plan developed by a plant ecologist familiar with the flora of the river for any areas such as roads that need to be restored;

f) A monitoring plan: The appropriate reclamation plans can turn river-bed and floodplain sand and gravel mining operations into something perceived by the public as desirable.

MARINE SAND MINING AND IMPACT ON MARINE BIODIVERSITY

The mining of marine aggregates is increasing significantly. Marine sand mining has had an impact on seabed flora and fauna. Dredging and extraction of aggregates from the benthic (sea bottom) zone destroys organisms, habitats and ecosystems and deeply affects the composition of biodiversity, usually leading to a net decline in faunal biomass and abundance or a shift in species composition. Aggregate particles that are too fine to be used are rejected by dredging boats, releasing vast dust plumes and changing water turbidity, resulting in major changes to aquatic and riparian habitats over large areas.

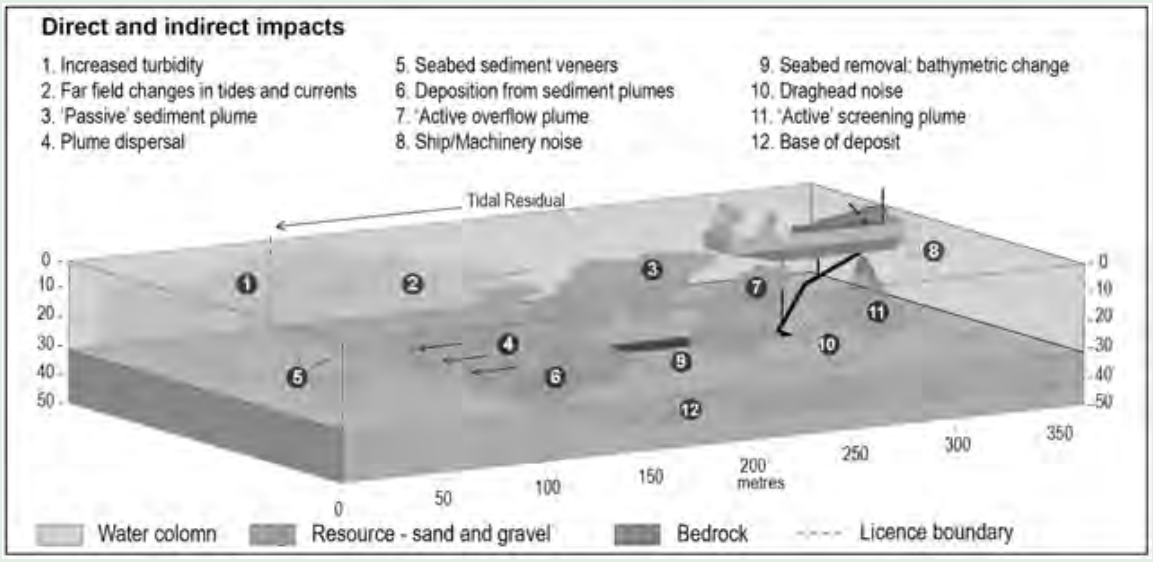

Figure: Direct and indirect consequences of aggregates dredging on the marine environment.

Source: Tillin, H.M., Houghton, A.J., Saunders, J.E., Drabble, R. and Hull, S.C., 2011. Direct and Indirect Impacts of Aggregate Dredging, Marine Aggregate Levy Sustainability Fund (MALSF). Science Monograph Series 1, 1-46.

REDUCING CONSUMPTION OF SAND

Because sand is still very cheap - sand itself is freely accessible; only extraction and transportation costs need to be covered - there is little or no incentive to induce a change in our consumption. Despite the very high value of minerals found in the sand, it is mostly used for concrete or is buried under highways. Recycled building and quarry dust material can be a substitute for sand. Concrete rubble should be recycled to avoid using aggregates, at least for low-quality uses.

Substitutes for sand are available. Quarry dust could be used to replace sand in general concrete structures. The replacement of sand by up to 40% of incinerator ash exhibits higher compressive strength than regular cement mortars. Some desert sand can be used if mixed with other material. There are alternatives for building houses, including wood, straw and recycled material. However, the current building industry is geared toward concrete know-how and equipment.

Training of architects and engineers, new laws and regulations, and positive incentives are needed to initiate a shift for lowering our dependency on sand. Renewable and recycled materials need to be targeted for building houses and roads. Use of Manufactured Sand (M-Sand) also needs to be promoted.

Alternative sources of sand and gravel, which accumulate at the bottom of dams, can also be targeted. Their use would address the problem of these aggregates accumulating which leads to a reduced capacity of dams to store water and could result in the dams' water intakes being blocked. Dams regularly release large amounts of water to flush out aggregates.

The important standard setting bodies in India are taking steps to promote the usage of alternatives to sand and gravel. Bureau of Indian Standards, the National Standards Body of the country, considering the scarcity of sand and coarse aggregates from natural sources, has evolved number of alternatives which are ultimately aimed at conservation of natural resources apart from promoting use of various waste materials without compromising in quality.

These measures include permitting in the Concrete Code (IS 456) as also in the National Building Code of India, the use of slag - a waste from steel industry, fly ash - a waste from thermal power plants, crushed over-burnt bricks and tiles - waste from clay brick and tile industry, in plain cement concrete as an alternative to sand/natural aggregate, subject to fulfilling the requirements of the Code. This Code, further, encourages use of fly ash and ground granulated blast furnace slag as part replacement of ordinary Portland cement in plain as well as reinforced cement concrete.

The Indian Standard on concrete mix design (IS 10262) has been upgraded to include guidance and examples of designing concrete mixes using fly ash and slag. Provisions for compliance for requisite quality of concrete made using fly ash and slag have been duly covered for the manufacturers of ready-mixed concrete in the Indian Standard Code of practice for RMC (IS 4926).

BIS has also formulated an Indian Standard Specification for artificial lightweight aggregates covering manufactured aggregates, such as foamed blast furnace slag, bloated clay aggregate, sintered fly ash aggregate and cinder aggregate (IS 9142).

A series of Indian Standards has also been formulated on various precast concrete products such as solid and hollow concrete blocks, light weight concrete blocks, autoclaved aerated concrete blocks, preformed foam concrete blocks, partial prefabricated concrete flooring and roofing units, concrete pipes, etc, all permitting use of fly ash and slag.

THE REPORT OF THE COMMITTEE HEADED BY SECRETARY, MoEF - 2010

A Committee headed by Secretary, Ministry of Environment and Forest was set up on the subject in 2010. The Committee considered this subject in detail and prepared a report. The important parts of the report are as follows:

Definition of Minor Mineral:

The term 'minor mineral' is defined in clause (e) of Section 3 of MMDR Act, 1957: '3 (e) "minor minerals" means building stones, gravel, ordinary clay, ordinary sand other than sand used for prescribed purposes and any other material which the Central Government may, by Notification in the Gazette of India declare to be a minor mineral;'

The term `ordinary sand' used in clause (e) of Section 3 of the MMDR Act, 1957 has been further clarified in rule 70 of the MCR, 1960 as:

(iv) Purposes of stowing in coal mines,
(v) For manufacture of silvicrete cement,
(vi) Manufacture of sodium silicate and for
(vii) Manufacture of pottery and glass.

Additionally, the Central Government has declared the following minerals as minor minerals:

Sl.No.	Minor Minerals
i)	Boulder
ii)	Shingle
iii)	Chalcedony pebbles used for ball mill purposes only
iv)	Lime shell, kankar and limestone used in kilns for manufacture of lime used as building material
v)	Murrum

Sl.No.	Minor Minerals
vi)	Brick-earth
vii)	Fuller's earth
viii)	Bentonite
ix)	Road metal
x)	Reh-matti

Sl.No.	Minor Minerals
xi)	Slate and shale when used for building material
xii)	Marble
xiii)	Stone used for making household utensils
xiv)	Quartzite and sandstone when used for purposes of building or for making road metal and household utensils
xv)	Saltpetre, and

xvi)	Ordinary earth (Used for filling or leveling purposes in construction or embankments, roads, railways building).

It may thus be observed that minerals have been classified into major and minor minerals based on their end use rather than level of production, level of mechanization, export and import etc. There do exist some minor mineral mines of silica sand and limestone where the scale of mechanization and level of production is much higher than those of industrial mineral mines. Further, in terms of the economic cost and revenue, it has been estimated that the total value of minor minerals constitutes about 10% of the total value of mineral production whereas the value of non- metallic minerals comprises only 3%. It is, therefore, evident that the operations of mines of minor minerals need to be subject to some regulatory parameters as that of mines of major minerals. Further, unlike India there does not exist such system in any other country where minerals are classified as major and minor based on end usage. Thus, there is a need to re-look at the definition of 'minor minerals' per se. It is, therefore, recommended that Ministry of Mines along with Indian Bureau of Mines, in consultation with the State Governments may re-examine the classification of minerals into major and minor categories so that the regulatory aspects and environment mitigation measures are appropriately integrated for ensuring sustainable and scientific mining with least impacts on environment.

Size of the Mine Lease:

Area for grant of mine lease varies from State to State. Maximum area which can be held under one or more mine lease is 2590 ha or 25.90 sq. miles in Jammu and Kashmir. Rajasthan prescribed a minimum limit of 1 ha for a lease. Maximum area prescribed for permit is 50x50 m. In most of the States area of permit is not specified in the rules.

It has recently been observed by Punjab and Haryana High Court in its order dated 15.05.2009 that State Government are apparently granting short term permits by dividing the mining area into small zones in effect to avoids environmental norms. There is, thus a need to bring uniformity in the extent of area to be granted for mine lease so as to ensure that eco- friendly scientific mining practices can be adopted. It is recommended that the minimum size of mine lease should be 5 ha. Further, preparation of comprehensive mine plan for contiguous stretches of mineral deposits by the respective State Governments may also be encouraged. This may suitably be incorporated in the Mineral Concession Rules, 1960 by Ministry of Mines.

Period of Mine Lease:

The period of lease varies from State to State depending on type of concessions, minerals and its end use. The minimum lease period is one year and maximum 30 years. Minerals like granite where huge investments are required, a period of 20 years is generally given with the provisions of renewal. Permits are generally granted for short periods which vary from one month to a maximum one year. In States like Haryana, minor mineral leases are auctioned for a particular time period. Mining is considered to be capital intensive industry and considerable time is lost for developing the mine before it attains the status of fully developed mine. If the tenure of the mine lease is short, it would encourage the lessee to concentrate more on rapid exploitation of mineral without really undertaking adequate measures for reclamation and rehabilitation of mined out area, posing thereby a serious threat to the environment and health of the workers and public at large.

There is thus, a need to bring uniformity in the period of lease. It is recommended that a minimum period of mine lease should be 5 years, so that eco- friendly scientific and sustainable mining practices are adopted. However, under exceptional circumstances arising due to judicial interventions, short term mining leases / contracts could be granted to the State Agencies to meet the situation arising there from.

Cluster of Mine Approach for Small Sized Mines:

Considering the nature of occurrence of minor mineral, economic condition of the lessee and the likely difficulties to be faced by Regulatory Authorities in monitoring the environmental impacts and implementation of necessary mitigation measures, it may be desirable to adopt cluster approach in case of smaller mine leases being operated presently. Further, these clusters need be provided with processing/crusher zones for forward integration and minimizing excessive pressure on road infrastructure. The respective State Governments / Mine Owners Associations may facilitate implementation of Environment Management Plans in such cluster of mines.

Requirement of Mine Plan for Minor Minerals:

At present, most of the State Governments have not made it mandatory for preparation of mining plan in respect of minor minerals. In some States like Rajasthan, eco- friendly mining plans are prepared, which are approved by the State Mining Department. The eco- friendly mining plans so prepared, though conceptually welcome, are observed to be deficient and need to be made comprehensive in a manner as is being done for major minerals. Besides, the aspects of reclamation and rehabilitation of mined out areas, progressive mine closure plan, as in vogue for major minerals could be introduced for minor minerals as well.

It is recommended that provision for preparation and approval of mine plan, as in the case of major minerals may appropriately be provided in the Rules governing the mining of minor minerals by the respective State Governments. These should specifically include the provision for reclamation and rehabilitation of mined out area, progressive mine closure plan and post mine land use.

Creation of Separate Corpus for Reclamation / Rehabilitation of Mines of Minor Minerals:

Mining of minor minerals, in our country, is by and large unorganized sector and is practiced in haphazard and unscientific manner. At times, the size of the leasehold is also too small to address the issue of reclamation and rehabilitation of mined outs areas. It may, therefore, be desirable that before the concept of mine closure plan for minor minerals is adopted, the existing abandoned mines may be reclaimed and rehabilitated with the involvement of the State Government. There is thus, a need to create a separate corpus, which may be utilized for reclamation and rehabilitation of mined out areas. The respective State Governments may work out a suitable mechanism for creation of such corpus on the `polluter pays' principle. An organizational structure may also need to be created for undertaking and monitoring these activities.

Depth of Mining:

Mining of minerals, whether major or minor have a direct bearing on the hydrological regime of the

area. Besides, affecting the availability of water as a resource, it also affects the quality of water through direct run of going into the surface water bodies and infiltration / leaching into groundwater. Further, groundwater withdrawal, dewatering of water from mine pit and diversion of surface water may cause surface and sub- surface hydrologic systems to dry up. An ideal situation would require that quarrying should be restricted to unsaturated zone only above the phreatic water table and should not intersect the groundwater table at any point of time. However, from the point of view of mineral conservation, it may not be desirable to impose blanket ban on mining operation below groundwater table. It is, therefore, recommended that detailed hydro-geological report should be prepared in respect of any mining operation for minor minerals to be undertaken below groundwater table. Based on the findings of the study so undertaken and the comments/ recommendations of Central Ground Water Authority/ State Ground Water Board, a decision regarding restriction on depth of mining for any area should be taken on case to case basis.

Uniform Minor Mineral Concession Rules:

The economic value of the minor minerals excavated in the country is estimated to contribute to about 9% of the total value of the minerals whereas the non- metallic minerals contribute to about 2.8%. Keeping in view the large extent of mining of minor minerals and its significant potential to adversely affect the environment, it is recommended that Model Mineral Concession rules may be framed for minor minerals as well and the minor minerals may be subjected to a simpler regulatory regime, which is, however, similar to major minerals regime.

River Bed Mining:

1. Environment damage being caused by unregulated river bed mining of sand, bajri and boulders is attracting considerable attention including in the courts. The following recommendations are therefore made for the river bed mining.

    (a) In the case of mining leases for riverbed sand mining, specific river stretches should be identified and mining permits/lease should be granted stretch wise, so that the requisite safeguard measures are duly implemented and are effectively monitored by the respective Regulatory Authorities.

    (b) The depth of mining may be restricted to 3m / water level, whichever is less.

    (c) For carrying out mining in proximity to any bridge and / or embankment, appropriate safety zone should be worked out on case to case basis, taking into account the structural parameters, locational aspects, flow rate etc. and no mining should be carried out in the safety zone so worked out.

Conclusion:

Mining of minor minerals, though individually, because of smaller size of mine leases is perceived to have lesser impact as compared to mining of major minerals. However, the activity as a whole is seen to have significant adverse impacts on environment. It is, therefore, necessary that the mining of minor minerals is subjected to simpler but strict regulatory regime and carried out only under an

approved framework of mining plan, which should provide for reclamation and rehabilitation of the mined out areas. Further, while granting mining leases by the respective State Governments "location of any eco-fragile zone (s) within the impact zone of the proposed mining area, the linked Rules/ Notifications governing such zones and the judicial pronouncements, if any, need be duly noted.

The Union Ministry of Mines along with Indian Bureau of Mines and respective State Governments should therefore make necessary provisions in this regard under the Mines and Minerals (Development and Regulation) Act, 1957, Mineral Concession Rules, 1960 and adopt model Guideliness to be followed by all States (emphasis supplied)".

REGIME OF LAW AND ADMINISTRATIVE ORDERS RELATING TO MINING OF MINOR MINERALS

The Entry 54 of List 1 in Schedule VII to the Constitution of India is the entry which empowers the Parliament in respect of 'Regulation of Mines and Minerals Development. Entry 23 of List 2 of the same Schedule, read with Article 246 (3) of the Constitution confers legislative powers on the State Legislature in respect of Regulation of Mines and Mineral Development, but, this power is subject to the provisions of List 1 with respect to the regulation and development under the control of the Union. The Parliament, with the object to amend and consolidate the law relating to the regulation of labour and safety in mines enacted the Mines Act, 1952. Section 2 (JJ) of the Mines Act, 1952 defines "minerals" to mean, all substances which can be obtained from the earth by mining, digging, drilling, dredging, hydraulicing, quarrying or by any other operation and includes mineral oils (which, in turn, include natural gas and petroleum). On 1st June, 1958, the Mines and Minerals (Development and Regulation) Act, 1957 was promulgated. This Act provides, inter alia, for general restrictions on undertaking prospecting and mining operations, the procedure for obtaining prospecting licenses or mining leases in respect of the land in which the minerals vests in the Government, the rule making power for regulating the grant of prospecting licenses and mining leases, special powers of Central Government to undertake prospecting or mining operations in certain cases, and for development of minerals.

The protection of natural environment is one of the fundamental duties of every citizen under Article 51-A of the Constitution of India. Article 48-A of the Constitution, obliged the State to endeavor to protect and improve the environment and to safeguard the forests and wild life of the country. The Environment (Protection) Act and Rules, 1986 were enacted and came into force on 19th November, 1986. The object of this Act is to provide for the protection and improvement of environment and for matters connected therewith. Under provisions of the Act and Rules of 1986, MoEFCC has issued various Notifications regulating the mining of minor minerals, specifically stating the procedures that were required to be complied by persons intending to carry on such mining activity and for the authorities to regulate the same.

Prior to 1994, there was no specific regime in place in relation to mining activity being carried out. The Notification issued by MoEF on 27th January, 1994, in exercise of the powers vested in it under Sub-Rule 3 of Rule 5 of the Rules of 1986 and Sub Section (1) and Clause (v) of Sub-Section (2) of Section 3 of the Act of 1986, prescribed the requirement and procedure for seeking Environmental Clearance for the projects listed in Schedule I. Schedule I of this Notification did not list mining projects of minor minerals. On the contrary, the projects covered under S. No. 20 of Schedule I of this Notification were only "mining projects (major mineral) with leases more than 5 hectares".

It provided for the constitution of Expert Committees and preparation of Environmental Impact Assessment Report which was to be evaluated and assessed by the Impact Assessment Agency. In exercise of its statutory powers afore-indicated, the Central Government on 14th September, 2006,

issued a Notification, i.e., 'Environment Impact Assessment Notification, 2006'. In terms of this Notification, the projects as stated in the Schedule to this Notification required prior Environmental Clearance as per the procedure. The projects have been categorised into two kinds, i.e., Category 'A' and Category 'B' under Clause 2 of the Notification. Projects under Category 'A' were required to take prior Environmental Clearance by MoEFCC. For Category 'B' projects, Environmental Clearance was to be given by State Environment Impact Assessment Authority (SEIAA).

The mining of minerals (both major and minor) were brought under the ambit of the EIA Notification, 2006. The mine lease area of more than equal to 50 ha was Category 'A' and mine lease area less than 50 ha and more than equal to 5 ha was category 'B' project. Mine lease area of less than 5 ha (both major and minor) was kept out of EIA Notification purview.

The Notification of 2006 came to be amended by Notification dated 1st December, 2009. It included the category of non-coal mine and coal mine lease and provided that non-coal mine lease of area more than equal to 5 ha and less than 50 ha will be category 'B' and mine lease area more than equal to 50 ha will be category 'A'. Similarly, mine lease area of more than equal to 5 ha and less than 150 ha for coal mine lease will be category 'B' and mine lease area of coal mine more than 150 ha will be category 'A'. Here again mining lease area of less than 5 ha (both coal and non-coal mine) was kept out of EIA Notification purview.

The Hon'ble Supreme Court, vide its order dated 27.2.2012 in I.A. No.12-13 of 2011 in SLP (C) No.19628-19629 of 2009 titled Deepak Kumar etc. v/s State of Haryana & Ors. has inter alia ordered *"We, in the meanwhile, order that leases of minor mineral including their renewal for an area of less than five hectares be granted by the States/Union Territories only after getting environmental clearance from the MoEF."*

Hon'ble Apex Court in Deepak Kumar's case (supra) extensively examined the environmental concerns, in the context of mining of minor minerals, considering its impact on the environment. The Apex Court observed that Extraction of alluvial material from within or near a streambed has a direct impact on the stream's physical habitat characteristics. These characteristics include bed elevation, substrate composition and stability, in-stream roughness elements, depth, velocity, turbidity, sediment transport, stream discharge and temperature. Altering these habitat characteristics can have deleterious impacts on both in-stream biota and the associated riparian habitat. The demand for sand continues to increase day by day as building and construction of new infrastructures and expansion of existing ones is continuous thereby placing immense pressure on the supply of the sand resource and hence mining activities are going on legally and illegally without any restrictions. Lack of proper planning and sand management cause disturbance of marine ecosystem and also upset the ability of natural marine processes to replenish the sand. Quarrying, mining and removal of sand from in-stream and upstream of several rivers, which may have serious environmental impact on ephemeral, seasonal and perennial rivers and river beds and sand extraction may have an adverse effect on bio-diversity as well. Further it may also lead to bed degradation and sedimentation having a negative effect on the aquatic life.

Apex Court observed that without conducting any study on the possible environmental impact on/

in the river beds and else- where the auction notices have been issued. Hon'ble Apex Court observed that "We are of the considered view that when we are faced with a situation where extraction of alluvial material within or near a river bed has an impact on the rivers physical habitat characteristics, like river stability, flood risk, environmental degradation, loss of habitat, decline in biodiversity, it is not an answer to say that the extraction is in blocks of less than 5 hectares, separated by 1 kilo meter, because their collective impact may be significant, hence the necessity of a proper environmental assessment plan".

In order to ensure compliance of the aforesaid order of the Hon'ble Supreme Court, MoEF issued an OM No.L-11011/47/2011-IA.II(M) dated 18.05.2012 stating inter alia that all mining projects of minor minerals including their renewal, irrespective of the size of the lease would henceforth require prior EC and that the projects of minor minerals with lease area less than 5 ha would be treated as Category "B" as defined in EIA Notification, 2006 and will be considered by the respective State Environment Impact Assessment Authorities (SEIAAs) notified by MoEF and following the procedure prescribed under the EIA Notification, 2006.

On 24th June, 2013, MoEF issued another Office Memorandum stating Guideliness for consideration of proposals for grant of Environmental Clearance under the Notification of 2006 for mining of 'brick earth' and 'ordinary earth' having lease area of less than 5 hectares. Referring to the judgment of the Hon'ble Supreme Court in the case of Deepak Kumar (supra) and its Office Memorandum dated 18th May, 2012, it further considered that the 'brick kiln' manufactures had stated that it was a small scale activity requiring that certain depth should be kept outside the purview of Environmental Clearance. Having considered various aspects, examining the recommendations of the Expert Committee, constituted by MoEF, finally it was directed as follows:

"(a) The activities of borrowing / excavation of 'brick earth' and ordinary earth', upto an area of less than 5 ha, may be categorized under 'B2' Category subject to the following Guideliness in terms of the provisions under '7.I Stage(1)-Screening' of EIA Notification, 2006:

(i) The activity associated with borrowing/excavation of 'brick earth' and 'ordinary earth' for purpose of brick manufacturing, construction of roads, embankments etc. shall not involve blasting.

(ii) The borrowing/excavation activity shall be restricted to a maximum depth of 2 m below general ground level at the site.

(iii) The borrowing/excavation activity shall be restricted to 2 m above the ground water table at the site.

(iv) The borrowing/excavation activity shall not alter the natural drainage pattern of the area.

(v) The borrowed/excavated pit shall be restored by the project proponent for useful purpose(s).

(vi) Appropriate fencing all around the borrowed/excavated pit shall be made to prevent any mishap.

(vii) Measures shall be taken to prevent dust emission by covering of borrowed/excavated earth during transportation.

(viii) Safeguards shall be adopted against health risks on account of breeding of vectors in the water bodies created due to borrowing/excavation of earth.

(ix) Workers / labourers shall be provided with facilities for drinking water and sanitation.

(x) A berm shall be left from the boundary of adjoining field having a width equal to at least half the depth of proposed excavation.

(xi) A minimum distance of 15 m from any civil structure shall be kept from the periphery of any excavation area.

2. (a) The concerned SEIAA while considering granting environmental clearance for such activity for brick earth / ordinary earth will prescribe the Guideliness as stated at (i) to (xi) above and specify that the clearance so granted shall be liable to be cancelled in case of any violation of above Guideliness.

(b) Notwithstanding what has been stated at (a) above, the following will apply:

(i) No borrowing of earth / excavation of 'brick earth' or 'ordinary earth' shall be permitted in case the area of borrowing/ excavation is within 1 km of boundary of national parks and wild life sanctuaries.

(ii) In case the area of borrowing / excavation is likely to result into a cluster situation i.e. if the periphery of one borrow area is less than 500 m from the periphery of another borrow area and the total borrow area equals or exceeds 5 ha, the activity shall become Category 'B 1' Project under the EIA Notification, 2006. In such a case, mining operations in any of the borrow areas in the cluster will be allowed only if the environmental clearance has been obtained in respect of the cluster. This issues with the approval of the Competent Authority."

These directions which were specific only to 'brick earth' and 'ordinary earth' activities for areas less than 5 hectares, as decided to be categorised as 'B 2' Category projects, subject to the restrictions stated in the memorandum, provided that if the cluster area exceeded 5 hectares, then it would become Category 'B 1' and would not be treated as Category 'B 2' projects. The above Office Memorandum was not dealing with the issues of sand mining or any other minor mineral activity except 'brick earth' and 'ordinary earth'. Further, MoEF has issued an amendment to EIA Notification vide Notification S.O. 2731 (E) dated 9th September 2013 and amended the EIA Notification, 2006 for item 1 (a) as follows:

(1)	(2)	(3)	(4)	(5)
"1(a)	(i) Mining of minerals.	≥ 50 ha of mining lease area in respect of non-coal mine lease	<50 ha of mining lease area in respect of minor minerals mine lease ; and < 50 ha ≥5 ha of mining lease area in respect of other non-coal mine lease.	General Conditions shall apply except for project or activity of less than 5 ha of mining lease area for minor minerals: Provided that the above exception shall not apply for project or activity if the sum total of the mining lease area of the said project or activity and that of existing operating mines and mining projects which were accorded environment clearance and are located within 500 metres from the periphery of such project or activity equals or exceeds 5 ha.
		>150 ha of mining lease area in respect of coal mine lease.	≤ 150 ha ≥ 5 ha of mining lease area in respect of coal mine lease.	(i) Prior environmental clearance is required at the stage of renewal of mine lease for which an application shall be made up to two years prior to the date due for renewal. Further, a period of two years with effect from the 4th April, 2011 is provided for obtaining environmental clearance for all those mine leases, which were operating as

(1)	(2)	(3)	(4)	(5)
				on the 4th April, 2011 with requisite valid environmental clearance and which have fallen due for renewal on or after the 4th November, 2011: Provided that no fresh environmental clearance shall be required for a mining project or activity at the time of renewal of mining lease, which has already obtained environmental clearance under this notification.
	(ii) Slurry pipelines (coal lignite and other ores) passing through national parks or sanctuaries or coral reefs, ecologically sensitive areas.	All projects.		(ii) Mineral prospecting is exempted.

In this Notification a new category of minor mineral was introduced and it was provided that mining lease area of minor mineral less than 50 ha will be category 'B' and will require EC. Accordingly the minor mineral mining projects having less than 5 hectare of lease area are required to be appraised by the SEIAA/SEAC of respective State for granting environment clearance. It was provided that the project or activity of less than 5 ha of mining lease area for minor minerals will be exempt from the General Conditions. Simultaneously the concept of cluster was introduced and it was provided that the exemption of applicability of General Conditions shall not apply for project or activity if the sum total of the mining lease area of the said project or activity and that of existing operating mines and mining projects which were accorded EC and are located within 500 m from the periphery of such project or activity equal or exceeds 5 ha.

The Ministry, on 24th December, 2013, issued another Office Memorandum for consideration of proposals for grant of Environmental Clearance regarding categorisation of Category 'B' projects into Category 'B (1)' and 'B (2)'. Mining of minor minerals had been separately dealt with in this Office Memorandum. This Office Memorandum stated that no river sand mining project with mining lease area of less than 5 hectares may be considered for grant of Environmental Clearance. Such area up to 25 hectares would be categorised as 'B (2)' and such projects were to be considered, subject to the stipulations stated therein. This Office Memorandum stated that no Environmental Clearance would be granted for extraction of minor minerals from any riverbed where the area is less than 5 hectares. Sand mining, in area other than riverbeds, would be permitted, only if the Project Proponent takes Environmental Clearance.

The Ministry vide Notification No. S.O. 1599 (E) dated 25.06.2014 reduced the area of 10 kilo meter to 5 kilo meters for applicability of General Conditions increasing the delegation to States by taking out projects located in 5 to 10 kilo meter of interstate boundary, CEPI, and, PAs from category 'A'.

The anomaly created by the Notification dated 09.09.2013 was corrected vide Notification No. S.O. 2601 (E) dated 7th October 2014, and category of minor mineral was deleted and mining leases were again classed as non-coal mine and coal mine and mining lease area of less than 50 ha was made category 'B' for non-coal mine and mine lease area of less than equal to 150 ha for coal mine was made category 'B'. The mine lease area of less than 5 ha was exempt from the applicability of General Conditions and cluster concept of Notification dated 09.09.2013 was retained.

Notification S.O. 2601 (E) dated 7th October 2014 provides as follows:

(1)	(2)	(3)	(4)	(5)
"1(a)	(i) Mining of minerals.	≥ 50 ha of mining lease area in respect of non-coal mine lease. >150 ha of mining lease area in respect of coal mine lease. Asbestos mining irrespective of mining area.	<50 ha of mining lease area in respect of non-coal mine lease. ≤ 150 ha of mining lease area in respect of coal mine lease.	General Conditions shall apply except for project or activity of less than 5 ha of mining lease area: Provided that the above exception shall not apply for project or activity if the sum total of the mining lease area of the said project or activity and that of existing operating mines and mining projects which were accorded environment clearance and are located within 500 metres from the periphery of such project or activity equals or exceeds 5 ha. Note: (i) Prior environmental clearance is required at the stage of renewal of mine lease for which an application shall be made up to two years prior to the date due for renewal. Provided that no fresh environmental clearance shall be required for a mining project or activity at the time of renewal of mining lease, which has already obtained environmental clearance under this notification. (ii) Mineral prospecting is exempted. "
	(ii) Slurry pipelines (coal lignite and other ores) passing through national parks or sanctuaries or coral reefs, ecologically sensitive areas	All projects.		

The NGT vide order dated 13.01.2015 (O.A. No. 123 of 2014 and M.A. No. 419 of 2014) has declared the Notification dated 09.09.2013 as invalid, inoperative and quashed it. The above order has also quashed the paragraph 4 (b) (i) of O.M. dated 24th June 2013 which provided that "No borrowing of earth / excavation of 'brick earth' or 'ordinary earth' shall be permitted in case the area of borrowing / excavation is within 1 km of boundary of national parks and wild life sanctuary." Though this provision was taken from the observation of Hon'ble Supreme Court in W.P. No. 435 of 2012 (Goa Foundation Vs. Union of India) and order dated 04.08.2006 of Supreme Court in *T.N. Godavarman Thirumulpad v. Union of India & Ors.* Supreme Court has taken a view that 1 km. from the boundaries of National Parks and Sanctuaries would be a safety zone, subject to the orders that may be made in IA No.1000 regarding Jamua Ramgarh Sanctuary and the State will not grant any Temporary Working Permit (TWP) in these safety zones comprising 1 km. from the boundaries of National Parks and Sanctuaries.

Similarly the proviso at paragraph 2 (iii) of O.M. dated 24.12.2013 which says that "No river sand mining project, with mine lease area less than 5 ha, may be considered for granting EC" has been quashed. This condition was taken from the recommendations of the Committee headed by the Secretary, MoEF constituted in 2010. The above proviso were quashed on the ground that as EIA Notification places no such restriction, so same cannot be imposed by an executive order and many hill States find it very difficult to get an area equal to or more than 5 ha. in riverbed. The information made available by the States also makes it clear that majority of the mining leases of sand are of area less than 5 hectares.

THE ISSUES AND MANAGEMENT OF MINING IN CLUSTER

In I.A. No. 12-13 of 2011 in SLP Nos. 729-731 / 2011, 21833 / 2009, 12498-499 / 2010, SLP (C) CC … 16157 / 2011 & CC 18235 / 2011 (Deepak Kumar and Ors. Vs. State of Haryana and Ors. etc.) Hon'ble Supreme Court in its order dated 27.02.2012 on the subject of cluster has quoted the submission of affidavit dated 23.11.2011 of MOEFCC. It says that "The Ministry is of the opinion that where the mining area is homogeneous, physically proximate and on identifiable piece of land of 5 ha. or more, it should not be broken into smaller sizes to circumvent the EIA Notification, 2006 as the EIA Notification, 2006 is not applicable to the mining projects having lease area of less than 5 ha. The Report of Committee on Minor Minerals, under the Chairmanship of Secretary (E&F) with representatives of various state governments as members including the State of Haryana and Rajasthan recommended a minimum lease size of 5 ha for minor minerals for undertaking scientific mining for the purpose of integrating and addressing environmental concerns. Only in cases of isolated discontinued mineral deposits in less than 5 ha, such mining leases may be considered keeping in view the mineral conservation".

The order further quotes that "Cluster of Mine Approach for Small Sized Mines: Considering the nature of occurrence of minor mineral, economic condition of the lessee and the likely difficulties to be faced by Regulatory Authorities in monitoring the environmental impacts and implementation of necessary mitigation measures, it may be desirable to adopt cluster approach in case of smaller mine leases being operated presently. Further these clusters need be provided with processing / crusher zones for forward integration and minimizing excessive pressure on road infrastructure. The respective State Governments / Mine Owners Association may facilitate implementation of Environment Management Plans in such cluster of mines." The order has further quoted the letter dated 1.06.2010 written by the then Minister of Environment, Forest and Climate Change which says on the subject that "A cluster approach to mines should be taken in case of smaller mines leases operating currently". The Hon'ble Court has ordered that "The State of Haryana and various other States have not so far implemented the above recommendations of the MoEF or the Guideliness issued by the Ministry of Mines before issuing auction notices granting short term permits by way of auction of minor mineral boulders gravel, sand etc., in the river beds and elsewhere of less than 5 hectares. We therefore, direct to all the States, Union Territories, MoEF and the Ministry of Mines to give effect to the recommendations made by MoEF in its report of March 2010 and the model Guideliness framed by the Ministry of Mines, within a period of six months from today and submit their compliance reports."

"We in the meanwhile, order that leases of minor mineral including their renewal for an area of less than five hectares be granted by the States/ Union Territories only after getting environmental clearance from the MoEF."

The Ministry vide O.M. No. L-11011/47/2011-IA.II (M) dated 18th May 2012 said that "In order to ensure compliance of the above referred order of the Hon'ble Supreme Court dated 27.02.2012, it has now been decided that all mining projects of minor minerals including their renewal, irrespective of the size of the lease would henceforth require prior environment clearance. Mining projects with lease area up to less than 50 ha including projects of minor mineral with lease area less than 5 ha would be treated as Category 'B' as defined in EIA Notification, 2006 and will be considered by the respective SEIAAs notified by MoEF and following the procedure prescribed under EIA Notification, 2006."

On the issue of cluster, the Notifications No. S.O. 2731 (E) dated 09.09.2013 and Notification No. S.O. No. 2601 (E) of 07.10.2014 were issued.

The above Notifications in Schedule at Item No. 1 (a) in Conditions mentions that "General Conditions shall apply except for projects or activity of less than 5 ha of mining lease area:

Provided that the above exception shall not apply for project or activity if the sum total of the mining lease area of the said project or activity and that of existing operating mines and mining projects which were accorded environment clearance and are located within 500 meters from the periphery of such projects or activity equals or exceeds 5 ha. The Office Memorandum No. J-13012/12/2013-IA-II (1) dated 24.12.2013 is about Guideliness for consideration of proposals for grant of environment clearance under Environment Impact Assessment Notification 2006 and its amendments - regarding categorization of Category 'B' projects/ activities into Category 'B1' & 'B2'.

The above O.M. besides categorizing the Category B into Category B1 & B2 also has directions on mining of brick earth / ordinary earth and river sand mining. These provisions are as follows:

"Mining of minor minerals:

As of now, mining projects of minor minerals with less than 50 hectare of mining lease areas are categorized as Category 'B' as per Notification S.O. 2731 (E) dated 9th September 2013. Also vide O.M. No. L-11011/47/2011-IA-II (M) dated 24.06.2013, Guideliness has been issued regarding categorization of mining projects of brick earth and ordinary earth having lease areas less than 5 hectare as Category 'B2' subject to stipulations stated therein.

In the above backdrop, the projects of mining of minor minerals, categorized as Category 'B' are hereby categorized as 'B2' as per the following:

(i) 'Brick Earth' / 'Ordinary Earth' mining projects having lease area less than 5 ha will be considered for granting EC as per the aforesaid Guideliness issued by MOEF on 24.06.2013.

(ii) 'Brick Earth' / 'Ordinary Earth' mining projects with mining lease area more than equal to 5 ha but less than equal to 25 ha and all other minor , mineral mining projects with mining lease area < 25 ha, except for river sand mining projects will be appraised as Category 'B2' projects.

These projects will be appraised based on the following documents:

(a) Form-1 as per the Appendix-I under the EIA Notification 2006

(b) Pre-feasibility report of the project

(c) Mining plan approved by the authorized agency of the concerned State Government.

Provided in case the mining lease area is likely to result into a cluster situation, i.e. if the periphery of one lease area is less than 500 meter from the periphery of another lease area and the total lease area equals or exceeds 25 ha, the activity shall become Category 'B1' Project under the EIA

Notification, 2006. In such a case, mining operations in any of the mine lease areas in the cluster will be allowed only if the environmental clearance has been obtained in respect of the cluster.

About river sand mining it says that:

(iii) No river sand mining project, with mine lease area less than 5 ha, may be considered for granting EC. The river sand mining projects with lease area more than equal to 5 ha but less than 25 ha will be categorized as 'B2'. In addition to the requirement of documents, as brought out above under sub-para (ii) above for appraisal, such projects will be considered subject to the following stipulations:

(a) The mining activity shall be done manually. The depth of mining shall be restricted to 3 m / water level, whichever is less.

(b) For carrying out mining in proximity to any bridge and / or embankment, appropriate safety zone shall be worked out on case to case basis to the satisfaction of SEAC / SEIAA, taking into account the structural parameters, locational aspects, flow rate etc., and no mining shall be carried out in the safety zone so worked out. No in-stream mining shall be allowed.

(c) The mining plan approved by the authorized agency of the State Government shall inter-alia include study to show that the annual replenishment of sand in the mining lease area is sufficient to sustain mining operations at levels prescribed in the mining plan and that the transport infrastructure is adequate to transport the mines material. In case of transportation by road the transport vehicles will be covered with the tarpaulin to minimize dust/ sand particle emissions.

(d) EC will be valid for mine lease period subject to a ceiling of 5 years.

Provided, in case the mining lease area is likely to result into a cluster situation i.e. if the periphery of one lease area is less than 1 km from the periphery of another lease area and total lease area equals to or exceeds 25 ha., the activity shall become Category 'B1' Projects under EIA Notification, 2006. In such a case, mining operation in any of the mine lease area in the cluster will be allowed only if the environment clearance has been obtained in respect of the cluster.

The NGT order dated 13.01.2015 in O.A. No. 123 of 2014 and M.A. No. 419 of 2014 has following directions on the issue of cluster: "In light of the judgment of the Supreme Court and what has emerged from the various cases that are subject matter of this Judgment, we direct the Ministry of Environment and Forest to formulate a uniform cluster policy in consultation with the States for permitting minor mineral mining activity including its regulatory regime, in accordance with law.

Notification S.O. 1559 (E) dated 25th June 2014 provides that "Any project or activity specified in Category 'B' will be appraised at the Central Level as Category 'A', if located in whole or in part within 5 km. from the boundary of: (i) Protected Areas; (ii) CEPI; (iii) ESA; (iv) Inter-state boundaries or international boundaries ……".

The NGT vide its order dated 13.01.2015 has quashed the Notification dated 9th September 2013, but similar provision on clusters exists in Notification dated 7th October 2014.

The EIA Notification 2006, as amended makes it clear that projects in respect of non-coal mine leases, where the area is more than equal to 50 hectares would require prior Environmental Clearance from MoEFCC, while the projects of area less than 50 hectares would be appraised for prior Environmental Clearance at the level of SEIAA.

The EIA Notification of 2006 in Clause 7 specifies the stages through which projects for grant of Environmental Clearance are required to be passed and processed. The stages include Screening, Scoping, Public Consultation and Appraisal, upon which, the Expert Appraisal Committee makes recommendation to the MoEF/SEIAA. Under 'Screening', this Clause 7 also provides for a further bifurcation of projects falling under category 'B' into 'B 1' and 'B 2'. The relevant part of Clause 7, dealing with this aspect, reads as under: "Stage (1) - Screening (Only for Category 'B' projects and activities): In case of Category 'B' projects or activities, this stage will entail the scrutiny of an application seeking prior environmental clearance made in Form 1 by the concerned State level Expert Appraisal Committee (SEAC) for determining whether or not the project or activity requires further environmental studies for preparation of an Environmental Impact Assessment (EIA) for its appraisal prior to the grant of environmental clearance depending up on the nature and location specificity of the project . The projects requiring an Environmental Impact Assessment report shall be termed Category 'B1' and remaining projects shall be termed Category 'B2' and will not require an Environment Impact Assessment report. For categorization of projects into B1 or B2 except item 8 (b), the Ministry of Environment and Forests shall issue appropriate Guideliness from time to time."

The Ministry on 24th December, 2013, issued Office Memorandum for consideration of proposals for grant of Environmental Clearance regarding categorisation of Category 'B' projects into Category 'B1' and 'B2'. Mining of minor minerals had been separately dealt with in this Office Memorandum. Such area up to 25 hectares would be categorised as 'B 2' and such projects were to be considered, subject to the stipulations stated therein.

The EIA Notification, 2006 does not provide for issuance of Environment Clearance to Cluster of mines. It provides for EC to individual lease holders / project proponents. This position has also been upheld by the Hon'ble Supreme Court in its judgment of Vivek Bansal Vs. State of Haryana that EC should be applied for and granted to the individual lease holder.

There has been rising concerns about adverse impact of mining on small leases (less than 5 hectare) in case the numbers of such leases are large and they are located in close proximity to each other. This leads to the definition of Cluster. To avoid the rigors of environment impact assessment studies, environment management plan and the environment clearance there has been a tendency to break the leases into size which does not attract the provisions of environment impact assessment studies, environment management plan, public consultation and the environment clearance. In Deepak Kumar's case Hon'ble Supreme Court also encountered this situation and in its order dated 27.02.2012 mandated that no mining lease or renewal be done without environment clearance irrespective of size.

It is seen that the categorization of mines into 'B1' and 'B2' category in which Category 'B2' leases are being exempted from the requirement of Environment Impact Assessment, Environment Management Plan, and Public Consultation for grant of EC, in many cases now the mining leases are being given for 25 hectares or less. This defeats the purpose and intent of Hon'ble Supreme Court Judgment which orders environment clearance for all mining leases irrespective of size. The environment clearance without Environment Impact Assessment, Environment Management Plan, and Public Consultation does not serve the purpose of environment clearance which is to ensure environmentally sustainable and socially responsible mining. So if a cluster or individual lease size exceeds 5 hectare, the EIA/ EMP should be completed in the process of grant of prior environment clearance.

The EIA Notification, 2006 and subsequent amendments to that or any O.M. issued by the Ministry do not provide for procedures and Competent Authority for environment clearance for cluster. In a cluster there will mostly be situation where there are a number of different lease holders and as per the settled law the lease holder has to do the working of mine and the lease holder is the one who can apply for and get the environment clearance. The conditions stipulated in the environment clearance have to be complied by the EC holder and any violation of that empowers the authority to cancel the environment clearance or prosecute the EC holder if necessitated by the circumstances.

For cluster there is no mechanism about who will apply for EC, EC will be issued in whose name, and who will be responsible for compliance of EC conditions.

The intent of cluster assessment is to have a holistic knowledge of the impact on environment by different mines operating in close proximity of each other. There are also requirement of mitigative measures which need implementation in concerted manner by different EC holders of that cluster. To ensure that it is important that there should be an integrated Environment Impact Assessment /

Environment Management Plan for the cluster to be presented before the authority appraising the projects and considering the proposals for grant of EC. This integrated EIA/ EMP can be prepared by either the lease holder, group of lease holders, State or the State Agencies. This EIA/ EMP need to be prepared by the accredited consultants / Registered Qualified Persons of the State Governments. The application for EC and grant of EC should be done in the name of individual lease holders in the background of the integrated EIA/EMP report. The Competent Authority (SEIAA/ SEAC / EAC) will entertain individual lease holder's application for grant of EC to individual mining lease projects in that cluster in the name of lease holders. The conditions related to mitigative measures necessitated by the integrated EIA/EMP may run across more than one lease holder or EC holders, that should figure in each EC accordingly and its compliance be ensured by the individual EC holders.

The Hon'ble Supreme Court, NGT, SEAC/EAC and the Project Proponents have raised issue of cluster in mine lease allotment and environment clearance for the same, so following conditions need to be ensured for cluster of mines:

1. To address the concern of adverse impact of minor mineral mining on environment it is proposed that all mining activity including river sand mining (above 5 hectare individual or cluster) will need to prepare Environment Impact Assessment Report and Environment Management Plan before grant of environment clearance. These reports (EIA /EMP) can be prepared by the State or State nominated Agency / the Project Proponent (s).
2. As can be seen from the data provided by the States most of the mining leases for minor minerals are of lease area less than 5 hectare. It is also reported that in hill states getting a stretch in river with area more than 5 hectare is very uncommon. So the size of lease for minor minerals including river sand mining will be determined by the States as per their circumstances.
3. The EIA Notification, 2006 does not provide for cluster EC, it provides for issuance of EC to individual project proponents and the same has also been upheld in the judgment of Hon'ble Supreme Court in Vijay Bansal vs. State of Haryana case. So EC will have to be applied for and issued to the individual project proponent.
4. A cluster shall be formed when the distance between the peripheries of one lease is less than 500 meters from the periphery of other lease in a homogeneous mineral area.
5. The mining of minor minerals is mostly in clusters. The Environment Impact Assessment or Environment Management Plan are required to be prepared for the entire cluster in order to capture all the possible externalities. These reports shall capture carrying capacity of the cluster, transportation and related issues, replenishment and recharge issues, geo-hydrological study of the cluster area. The Environment Impact Assessment or Environment Management Plan shall be prepared by the State or State nominated Agency or group of project proponents

in the Cluster or the project proponent in the cluster.

6. The individual lease holders in cluster can use the same Environment Impact Assessment or Environment Management Plan for application for environmental clearance. The cluster Environment Impact Assessment or Environment Management Plan shall be updated as per need keeping in view any significant change.

7. There shall be one public consultation for entire cluster after which the final Environment Impact Assessment or Environment Management Plan report for the cluster shall be prepared.

8. The details of cluster Environment Impact Assessment or Environment Management Plan shall be reflected in each environmental clearance in that cluster and District Expert Appraisal Committee (DEAC), SEAC, and EAC shall ensure that the mitigative measures emanating from the Environment Impact Assessment or Environment Management Plan study are fully reflected as environmental clearance conditions in the environmental clearance's of individual project proponents in that cluster.

9. As the sand is mostly mined from rivers and majority of the rivers which are important source of sand also form boundary between States, so because of General Conditions most of the sand mining projects become Category 'A' project. So the General Conditions will not apply in case of river sand and gravel mining projects on account of being in 5 kilometer of inter-state boundary.

10. The Committee headed by the District Magistrate or District Collector will be empowered to appraise and grant EC for mining leases up to 5 ha in case of individual lease and up to 25ha in case of cluster for sand mining.

11. In case the mining leases are in cluster (if periphery of one lease is within 500 meters), fowling are the categorization of projects:-

- Category 'B2'Project: Cluster area of mine leases up to 5 ha and to be dealt at DEIAA/ DEAC level
- Category 'B2'Project: Cluster area of Mine leases > 5 ha and < 25 ha with no individual lease > 5 ha and to be dealt at DEIAA/DEAC level
- Category 'B1'Project: Cluster of mine leases of area > 25 hectares with individual lease size < 50ha and to be dealt at SEIAA/SEAC level
- Category 'A' Project: Cluster of any size with any of the individual lease >50ha and to be dealt at MoEFCC/EAC level

The schematic presentation of requirements on Environmental Clearance of Sand Mining including cluster situation is detailed as below:-

Area of Lease (Hectare)	Category of Project	Require-ment of EIA / EMP	Require-ment of Public Hearing	Require-ment of EC	Who can prepare EIA/ EMP	Who will apply for EC	Authority to appraise/ grant EC	Authority to monitor EC compliance
EC Proposal of Sand Mining in cluster situation								
Cluster area of mine leases up to 5 ha	**'B2'**	Form-1M, PFR and Approved Mine Plan	No	Yes	State, State Agency, Group of Project Proponents, Project Proponent	Project Proponent	DEAC/ DEIAA/	DEIAA SEIAA SPCB CPCB MoEFCC Agency nominated by MoEFCC
Cluster area of Mine leases > 5 ha and < 25 ha with no individual lease > 5 ha	**'B2'**	Form-I, PFR and Approved Mine Plan and one EMP for all leases in the Cluster	No	Yes	State, State Agency, Group of Project Proponents, Project Proponent	Project Proponent	DEAC/ DEIAA/	
Cluster of mine leases of area > 25 hectares with individual lease size < 50ha	**'B1'**	Yes	Yes	Yes	State, State Agency, Group of Project Proponents, Project Proponent	Project Proponent	SEAC/ SEIAA	

Cluster of any size with any of the individual lease > 50ha	**'A'**	Yes	Yes	Yes	State, State Agency, Group of Project Proponents, Project Proponent	Project Proponent	EAC/ MoEFCC	

MANAGEMENT OF SAND DEPOSITED AFTER FLOOD ON AGRICULTURAL FIELD OF FARMERS

The Standing Committee on Water Resources on issues, concerning flood management, compensation, and status of ownership of submerged and eroded land in the country including compensation to farmers for loss of their crops destroyed by floods and right to disposal of the sand left in the fields of farmers in its meeting held on 29.04.2015 made observations on this subject.

The Committee observed that pursuant to Hon'ble Supreme Court of India decision in "Deepak Kumar Case" in 2012, regulations were framed by the Ministry of Mines to guide environmental clearance of minor minerals. … The Committee, therefore, desires the Ministry of Water Resources, River Development and Ganga Rejuvenation to work in close coordination with the Ministry of Mines and Environment, Forest and Climate Change to frame regulations / Guideliness in this regard expeditiously.

Mining of Sand

The Committee further observed that due to the floods, the agricultural land of farmer is destroyed and rendered infertile. Further the farmer loses his livelihood as the produce of his land is destroyed by flood and become unsalable. The farmer is also deprived of the right of lifting sand from his land. He is therefore, left helpless and destitute and leave their land in search of job.

The Committee observes that "mining operation" means any operation undertaken for the purpose of winning any mineral. Accordingly, if desilting is undertaken perse with the objective of winning a mineral then only it will be construed as a mining operation. Apparently, if the desilting is undertaken not for winning any mineral, it will not be construed as mining operation and therefore, the farmer can remove the sand from the land without requiring the requisite permits. However, the Committee strongly feels that the farmer be given the right to use and dispose-off the sand accumulated over their land post flood, by incorporating the necessary provisions in the Mines and Mineral (Development and Regulation) Act, 1957".

Removal of sand from the agricultural field by the owner farmer of the land from environment point of view will not be considered as mining operation and its removal and disposal can be allowed without the requirement of environment clearance till it is done only to the extent of reclaiming the agricultural land. The sand deposited after flood only be removed, so no mining / digging below the ground level is allowed. For removing sand in case where private land has gone into the river due to erosion, the requirement of mining lease and environment clearance will continue. This operation

of removal of sand deposited on agricultural field should be done after a mapping of deposition is done by the Land Management Committee of the Gram Panchayat. The sand so deposited post flood can be removed by the farmer owning the land / group of farmers affected by this post flood sand deposition or the Gram Panchayat. Customary rights to remove and dispose off the sand should be given to the farmer affected by deposition of sand on account of sudden flood in his agricultural land.

MINING OF SAND FROM AGRICULTURAL FIELD

This practice is prevalent in Haryana, where the top layer of soil varying between 1 and 2 meters is removed and stacked separately and thereafter the sand deposit which may be 10-15 meter deep is mined. After removing the sand layer up to a maximum depth of 09 meters, the top soil stacked is spread out on the field and the same is brought under the cultivation. Though the level of this land (mined out area) is lowered to the depth of the excavation and in initial years of cultivation the productivity is low, but the productivity of the fields improves with continued cultivation and addition of organic manure in the field. In Haryana some leases are of large area (ranging from 1000 hectare to 2000 hectare) the agricultural fields and river bed both are included in the same lease for mining.

The following recommendations should be kept in mind for mining in such leases:

1. Mining of sand in such mine leases will require environment clearance.
2. The lease should be of sand mining either from the agricultural field or river. In same lease both type of area should not be included.
3. The sand mining from agricultural field is being done in Haryana for a long time and it can be done in a more sustainable manner without adverse impact on agricultural productivity, if proper environmental safeguards are taken.
4. The slope of mining area adjacent to agricultural fields should be proper (preferably 45-60 degree) and adequate gap (minimum 10 feet) be left from adjacent agricultural field to avoid erosion and scouring.

CUSTOMARY RIGHT ON SAND MINING

The native people have their long held customary rights to take silt, sand & soil from their tanks and nearby rivers for their use or community works in the village in almost all the States in some form or the other.

Next to the reserved forests, tanks and rivers are the biggest common properties in India. Most of the village tanks are 'government properties' with some exceptions of privately held tanks. Land revenue department, irrigation department and forest department is given powers to deal with property right' and hence protecting all tanks and rivers preventing damages including encroachments is their responsibility. The local villagers were given 'customary rights' under the Revenue Department Orders, and other laws related to Panchayats and Easements to take sand, soil and earth for agricultural and domestic purposes without seeking any permission from anyone. The States strive to keep these customary rights to use such resources like soil and sand for individuals work and community work in the village intact without requirement of any permit and clearance. These customary rights need to be protected and respected.

DESILTING OF RESERVOIRS / BARRAGES / ANNECUTS / LAKES / CANALS

These structures are generally in possession and maintenance of Irrigation Department / Minor Irrigation Department / PHED of State Governments. The dams and reservoirs can be a significant source of sand. Many such structures are silted and their water holding capacity has gone down considerably. In some instances to compensate for silted capacity raising of height of dam or construction of new structures is proposed which further leads to submergence of new areas of agricultural field and forests. Taking up desilting of such projects can serve dual purpose of increasing the water holding capacity and making available the sand for other usage. In some States the Irrigation Department is permitted to use it for the departmental works free of charge and balance can be disposed of in market after paying the due royalty. A detailed study is required to be carried out to verify economic viability and environmental sustainability before contemplating dredging of storage reservoirs for sand / gravel mining.

The de-silting of reservoir, dredging for upkeep and maintenance of structures, channels and averting natural disasters will not be treated as mining for the purpose of environmental clearance.

The Ministry of Water Resources (MoWR) view on desiltation from flood control point of view is as follows:

A multidisciplinary Committee (Mittal Committee) under the chairmanship of Dr. B.K. Mittal, former Chairman, Central Water Commission was constituted by MoWR, vide letter dated 08.10.2001 to identify cause and extent of siltations in rivers, suggest measures to minimize siltation, examine as to whether desilting is a technically feasible means to minimize magnitude of flood in rivers, suggest appropriate technology/ methods of desilting of rivers, propose a realistic operational programme in a time bound manner and other related aspects. The committee studied in respect of few sites on Ganga, Brahmputra, Godavari, Krishna etc., and inter-alia concluded that:

i) Siltation in river is not pronounced and alarming;

ii) Desilting of rivers for flood control is not an economically viable solution;

iii) Dredging in general has been found to be inadequate and should not be resorted to, particularly in major rivers;

iv) There are, of course, some locations such as tidal rivers, confluence points with narrow constrictions and the like which can be tackled by desilting after thorough examination and techno-economic justification;

v) Selective dredging is suggested depending upon local conditions; and

vi) Desilting of rivers can marginally minimize the magnitude of floods and be effective only for a short period.

Thus, desilting in general is not feasible technically, due to several reasons like non-sustainability, non- availability of vast land required for disposal of dredged material etc. This cannot be viewed in isolation of other approaches to manage floods. Desilting of rivers in vulnerable reaches may be suggested based on model study, if it is found techno-economically viable. For navigation purposes, the river reaches in the water ways path may be dredged to have minimum depth of water.

MINING PLAN

The Environment Clearance shall be given to only those mining leases which have mine plan approved by the Competent Authority designated by the States. Modification of the mining plan during operation will also need approval of the Competent Authority. The Mining Plan shall be prepared by the Recognised Qualified Persons (RQP). The person to be recognized for preparing the mining plan should be a holding a degree of Mining Engineering, Environmental Engineering or a post graduate degree in Geology granted by a University established or incorporated by or under a Central Act or a State Act including any institutions recognized by the UGC or any equivalent qualification granted by any University or institution outside India and have a professional experience of three years of working in a supervisory capacity in the field of mining after obtaining a degree. The States will devise their own mechanism of selection and empanelment of RQPs. A mining plan should be valid for a period of 5 years, which can be renewed further.

EVALUATING THE IMPACT OF SAND MINING

To assess the impact of mining and effect of remedial measures can be assessed through monitoring. This is also required for mid-course corrections. Monitoring will provide data to evaluate the upstream and downstream effects of sand and gravel extraction activities, and long-term changes. A brief report summarizing the annual results of the physical and biological monitoring should document the evolution of the sites over time, and the cumulative effects of sand and gravel extraction. The summary should also recommend any modification of extraction rates needed to minimize impacts of extraction.

Sand Replenishment, Geomorphology and Hydrology:

Physical monitoring requirements of sand and gravel extraction activities should include surveyed channel cross-sections, longitudinal profiles, bed material measurements, geomorphic maps, and discharge and sediment transport measurements. The physical data will illustrate bar replenishment and any changes in channel morphology, bank erosion, or particle size.

In addition to local monitoring for replenishment at specific mining sites, monitoring of the entire reach through the estuary will provide information on the cumulative response of the system to sand and gravel extraction. For example, it is important for downstream bars and the estuary to receive sufficient sand and gravel to maintain estuarine structure and function. Because the elevation of the bed of the channel is variable from year to year, a reach-based approach to monitoring will provide a larger context for site-specific changes. If long-term monitoring data show that there is a reach-scale trend of bed lowering (on bars or in the thalweg), the extraction could be limited.

Cross-sections:

Surveyed channel cross-sections should be located at permanently documented sites upstream, downstream and within the extraction area. Cross-sections intended to show reach- scale changes

should be consistently located over geomorphic features such as at the head of riffles, across the deepest part of pools, or across particular types of channel bars.

Cross-section spacing should be close enough to define the morphology of the river channel. Cross-section data should be surveyed in March or April to evaluate changes that may occur during the flooding season.

Cross-section data should be collected over the reach to the estuary, and locally upstream, downstream, and within each mining site. This long-term monitoring data should be collected and analyzed even if no mining occurs in order to understand and estimate the sand budget of the river reach.

Photo-documentation:

Photographs of the project sites should be taken prior to excavation to document the baseline conditions, and again during each monitoring session. Photos should be taken twice a year. Photos of structures nearby like outfalls / off-takes, intakes, bridges and other structures may also be regularly taken.

Groundwater Level:

Monitoring wells should be established adjacent to each off-channel floodplain excavation to record changes in ground water levels. Measurements should be taken monthly. This should help analyse surface water and ground water interaction along the reach.

Extent and Quality of Riparian Vegetation:

Document the extent and quality of riparian vegetation, including successional status, and any increase in disturbance indicators (non-native plants). The extent of riparian habitat can be determined utilising aerial photos. Habitat quality data, i.e., successional status and species composition, must be determined through field reconnaissance.

Riparian Vegetation Maps:

Develop yearly maps of the sensitive habitat areas and document their aerial extent over time. These maps may be combined with the geomorphic maps. Monitor sites identified as sensitive for disturbance in excess of expected geomorphic trends - i.e., massive bank wasting up or downstream from an active mine site. Monitor sand and gravel mining impacts which may translate up and downstream, causing accelerated erosion of sensitive zones and impacting the ability of new habitat to form due to excessive scour or sedimentation.

This monitoring / documentation should be done by the EC holders and will be regularly checked and assessed by the DEIAA for corrective steps in time. The DEIAA should review the status of monitoring and documentation data of each mining site especially for sand mining once in a year.

MONITORING SYSTEM FOR SUSTAINABLE SAND MINING

The implementation of these Guideliness on Sustainable Sand Mining is not possible till States create a robust mechanism to monitor the mining operation and measure the mined out mineral. The entire exercise of Environment Impact Assessment and Environment Management Plan aims towards making the mining process environmentally sustainable. The Environment Clearance letter indicates the EC capacity that is the quantity of material which can be mined in a year. If this quantity is not measured, and much more mineral than envisaged in the EC is mined out then the entire process of EC is rendered futile. Keeping above objective in mind it is required of the State / State Agencies to create and establish a robust system to monitor and measure the mined out mineral at each lease location and its transportation in State.

The State Governments have tried various methods for monitoring the sand mining in their areas, the main feature of which generally has been through Transport Permits (T.P.). The printing of Transport Permits on security paper, invisible ink mark, fugitive ink background, VOID pantograph and Unique Barcode are some of the tools used by the States. These tools need to be backed by suitable software and dedicated websites with security certifications at different levels.

The system proposed is that States should issue Transport Permit. Bar code on the T.P. when scanned using the system, will generate a unique invoice number. The bidder has to enter destination, distance between plot and destination, vehicle number etc in the system. After scanning, unique bar code number; invoice date & time and validity date & time is sent to the bidder, which need to be written on T.P. Validity of T.P. is calculated based on distance between plot and destination. After validity time is over the T.P. stands invalid. The officers involved in monitoring should be provided with the android application using which the T.P. can be checked anywhere on road. As soon as the bar code on T.P. gets scanned through using android application, all details of T.P. such as plot details, vehicle details, validity time etc. should get fetched from server. This means, if anything is re-written on T.P. and attempt is made to reuse the same, it can be traced immediately. Registering of T.P. on server can be done using website, using android application (smartphone with internet) or even through SMS (smartphone without internet). This implies that TP can be registered on server even if only mobile phone range is available on plot. Various reports can be generated using the system showing daily lifting reports and user performance report. This way the vehicles carrying sand can be tracked from source to destination.

MONITORING SYSTEM FOR SUSTAINABLE SAND MINING

PROCEDURE FOR MONITORING OF SAND MINING OR RIVER BED MINING

1. The security feature of Transport Permit shall be as under:

(a) Printed on Indian Banks' Association (IBA) approved Magnetic Ink Character Recognition (MICR) Code paper.

(b) Unique Barcode.

(c) Unique Quick Response (QR) code.

(d) Fugitive Ink Background.

(e) Invisible Ink Mark.

(f) Void Pantograph.

(g) Watermark.

2. Requirement at Mine Lease Site:

(a) Small Size Plot (Up to 5 hectare): Android Based Smart Phone.

(b) Large Size Plots (More than 5 hectare): CCTV camera, Personal Computer (PC), Internet Connection, Power Back up.

(c) Access control of mine lease site.

(d) Arrangement for weight or approximation of weight of mined out mineral on basis of volume of the trailer of vehicle used.

3. Scanning of Transport Permit or Receipt and Uploading on Server:

(a) Website: Scanning of receipt on mining site can be done through barcode scanner and computer using the software;

(b) Android Application: Scanning on mining site can be done using Android Application using smart phone. It will require internet availability on SIM card;

(c) SMS: Transport Permit or Receipt shall be uploaded on server even by sending SMS through mobile. Once Transport Permit or Receipt get uploaded, an unique invoice code gets generated with its validity period.

4. Proposed working of the system:

The State Mining Department should print the Transport Permit or Receipt with security features enumerated at Paragraph 1 above and issue them to the mine lease holder through the District Collector. Once these Transport Permits or Receipts are issued, they would be uploaded on the server against that mine lease area. Each receipt should be preferably with pre-fixed quantity, so the total quantity gets determined for the receipts issued.

When the Transport Permit or Receipt barcode gets scanned and invoice is generated, that particular barcode gets used and its validity time is recorded on the server. So all the details of transporting of mined out material can be captured on the server and the Transport Permit or Receipt cannot be reused.

5. Checking On Route:

The staff deployed for the purpose of checking of vehicles carrying mined mineral should be in a position to check the validity of Transport Permit or Receipt by scanning them using website, Android Application and SMS.

6. Breakdown of Vehicle:

In case the Vehicle breakdown, the validity of Transport Permit or Receipt shall be extended by sending SMS by driver in specific format to report breakdown of vehicle. The server will register this information and register the breakdown. The State can also establish a call centre, which can register breakdowns of such vehicles and extend the validity period. The subsequent restart of the vehicle also should be similarly reported to the server or call centre.

7. Tracking of Vehicles:

The route of vehicle from source to destination can be tracked through the system using check points, RFID Tags, and GPS tracking.

8. Alerts or Report Generation and Action Review:

The system will enable the authorities to develop periodic report on different parameters like daily lifting report, vehicle log or history, lifting against allocation, and total lifting. The system can be used to generate auto mails or SMS. This will enable the District Collector or District Magistrate to get all the relevant details and shall enable the authority to block the scanning facility of any site found to be indulged in irregularity. Whenever any authority intercepts any vehicle transporting illegal sand, it shall get registered on the server and shall be mandatory for the officer to fill in the report on action taken. Every intercepted vehicle shall be tracked.

The monitoring of mined out mineral, environmental clearance conditions and enforcement of Environment Management Plan will be ensured by the DEIAA, SEIAA and the State Pollution Control Board or Committee. The monitoring arrangements envisaged above shall be put in place. The monitoring of enforcement of environmental clearance conditions shall be done by the Central Pollution Control Board, Ministry of Environment, Forest and Climate Change and the agency nominated by the Ministry for the purpose.

ADMINISTRATIVE STRUCTURE FOR ENVIRONMENT CLEARANCE AND ENSURING COMPLIANCE OF EC CONDITIONS

An no mining in allowed without Envirnomental Clearance. The process of EC involves preparation of EIA/EMP, PER and mine plan.

The EIA/EMP can be prepared by the State Government or any agency of the State, group of project proponents in the cluster or the individual project proponent. The EIA / EMP can be prepared by the accredited consultants or the Registered Qualified Person(s) / agencies selected by the States.

DISTRICT ENVIRONMENT IMPACT ASSESSMENT AUTHORITY

The Central Government has constituted the District Level Environment Impact Assessment Authority (DEIAA), for grant of environmental clearance for Category 'B2' Projects for mining of minor minerals, for all the districts in the country.

For, minor minerals including sand and gravel mining lease of area up to 5 hectare in case of individual lease and up to 25 ha in case of cluster for sand mining, the grant of EC will be done by the District Environment Impact Assessment Authority (DEIAA) headed by the District Magistrate or District Collector. This Authority will be responsible for proper and sustainable management of sand mining in the district. The Authority will be responsible for designating the area / stretch in river suitable for mining in the district and also identifying the area / stretch in river prohibited for sand mining. The Authority will ensure clear demarcation of mining site, its documentation, and ensuring that no mining takes place without EIA / EMP and EC of the mining site.

The Chairperson and official members of the Authority for the districts should hold office during their tenure in the district on said posts and the expert member shall hold office for a period of three years from the date of nomination by the Competent Authority. The Committee shall meet at least once in a month.

The District Environment Impact Assessment Authority (DEIAA) :

The DEIAA will have following composition :

1.	District Magistrate or District Collector of the district	Chairperson
2.	Senior most Divisional Forest Officer in the district	Member
3.	An expert member to be nominated by the Divisional Commissioner or Chief Conservator of the Forest	Member
4.	Sub-Divisional Magistrate or Sub-Divisional Officer of the district head quarter	Member-Secretary

DISTRICT LEVEL EXPERT APPRAISAL COMMITTEE:

The District Level Expert Appraisal Committee (DEAC) will appraise the cases and make recommendations to the District Environment Impact Assessment Authority for environmental clearance. This Committee will also make recommendations / suggestions on the District Survey Report to the DEIAA. The DEAC will have following composition:

1.	Senior most Executive Engineer, Irrigation Department	Chairperson
2.	Senior most Sub-Divisional Officer (Forest)	Member
3.	A representative of Remote Sensing Department or Geology Department or State Ground Water Department to be nominated by the District Magistrate or District Collector	Member
4.	Occupational health expert or Medical Officer to be nominated by the District Magistrate or District Collector	Member
5.	Engineer from Zila Parishad	Member
6.	A representative of State Pollution Control Board or Committee	Member
7.	An expert to be nominated by the Divisional Commissioner or Chief Conservator of Forest	Member
8.	An expert to be nominated by the Divisional Commissioner or Chief Conservator of Forest	Member
9.	An expert to be nominated by the Divisional Commissioner or Chief Conservator of Forest	Member
10.	Senior most Assistant Engineer, Public Works Department	Member
11.	Assistant Director or Deputy Director or District Mines Officer or Geologist in the district in that order	Member- Secretary

The DEAC will meet at least once a month, depending on the work load the frequency of meetings can be decided by the Chairperson of DEAC and Chairperson, DEIAA.

Each proposal for the mining lease under consideration for environmental clearance in the district will be inspected on-site by the Sub-Divisional Level Committee headed by the SDM.

The Sub-Divisional Committee should comprise of following officers:

Sub-Divisional Magistrate	Chairperson
Sub-Divisional Officer, Forest/ Assistant Conservator of Forest/ Forest Range Officer	Member
Representative of State Pollution Control Board	Member
SDO, Irrigation Department	Member
Geologist or Assistant Geologist or Mining Officer / Mining Inspector	Member

The presence of at least three members will be needed for inspection. This Committee shall submit its report within 15 days from the receipt of the proposal.

The monitoring of EC conditions and enforcement of EMP will be ensured by the District Collector and the, State Pollution Control Board. The monitoring of enforcement of EC conditions can also be done by the Central Pollution Control Board, Ministry of Environment, Forest & Climate Change and the agency nominated by the Ministry for the purpose.

Schematic Presentation of Requirements on Environmental Clearance of Sand Mining including cluster situation

Area of Lease (Hectare)	Category of Project	Require-ment of EIA / EMP	Require-ment of Public Hearing	Require-ment of EC	Who can prepare EIA/ EMP	Who will apply for EC	Authority to appraise/ grant EC	Authority to monitor EC compliance
EC Proposal of Sand Mining on the basis of individual mine lease								
0 - 5ha	**'B2'**	Form - 1M, PFR and Approved Mine Plan	No	Yes	Project Proponent	Project Proponent	DEAC/ DEIAA	DEIAA SEIAA SPCB CPCB MoEFCC Agency nominated by MoEFCC

> 5 ha and < 25 ha	**'B2'**	Form-I, PFR and Approved Mine Plan and EMP	No	Yes	Project Proponent	Project Proponent	SEAC / SEIAA	DEIAA SEIAA SPCB CPCB MoEFCC Agency nominated by MoEFCC
≥ 25ha and < 50ha	**'B1'**	Yes	Yes	Yes	Project Proponent	Project Proponent	SEAC / SEIAA	
≥ 50 ha	**'A'**	Yes	Yes	Yes	Project Proponent	Project Proponent	SEAC / SEIAA	
EC Proposal of Sand Mining in cluster situation								
Cluster area of mine leases up to 5 ha	**'B2'**	Form - 1M, PFR and Approved Mine Plan	No	Yes	State, State Agency, Group of Project Proponents, Project Proponent	Project Proponent	DEAC/ DEIAA/	DEIAA SEIAA SPCB CPCB MoEFCC Agency nominated by MoEFCC
Cluster area of Mine leases > 5 ha and < 25 ha with no individual lease > 5 ha	**'B2'**	Form -I, PFR and Approved Mine Plan and one EMP for all leases in the Cluster	No	Yes	State, State Agency, Group of Project Proponents, Project Proponent	Project Proponent	DEAC/ DEIAA/	

Cluster of mine leases of area ≥ 25 hectares with individual lease size < 50ha	**'B1'**	Yes	Yes	Yes	State, State Agency, Group of Project Proponents, Project Proponent	Project Proponent	SEAC/ SEIAA	
Cluster of any size with any of the individual lease ≥ 50ha	**'A'**	Yes	Yes	Yes	State, State Agency, Group of Project Proponents, Project Proponent	Project Proponent	EAC/ MoEFCC	

General Conditions will not apply on account of inter- state boundaries for river sand mining leases.

EXEMPTION OF CERTAIN CASES FROM BEING CONSIDERED AS MINING FOR THE PURPOSE OF REQUIREMNT OF ENVIRONMENTAL CLEARANCE

Keeping in view the purpose, maintenance of infrastructure, abatement of disasters, customary easement and property rights, it is felt that following cases may not be treated as mining for the purpose of requirement of environmental clearance. The following cases shall not require prior environmental clearance, namely:-

1. Extraction of ordinary clay or sand, manually, by the Kumhars (Potter) to prepare earthen pots, lamp, toys, etc. as per their customs.
2. Extraction of ordinary clay or sand, manually, by earthen tile makers who prepare earthen tiles.
3. Removal of sand deposits on agricultural field after flood by farmers.
4. Customary extraction of sand and ordinary earth from sources situated in Gram Panchayat for personal use or community work in village.
5. Community works like de-silting of village ponds or tanks, construction of village roads, ponds, bunds undertaken in Mahatama Gandhi National Rural Employment and Guarantee Schemes, other Government sponsored schemes, and community efforts.
6. Dredging and de-silting of dams, reservoirs, weirs, barrages, river, and canals for the purpose of their maintenance, upkeep and disaster management.
7. Traditional occupational work of sand by Vanjara and Oads in Gujarat vide notification number GU/90(16)/MCR-2189(68)/5-CHH, dated the 14th February, 1990 of the Government of Gujarat.
8. Digging of well for irrigation or drinking water.
9. Digging of foundation for buildings not requiring prior environmental clearance.
10. Excavation of ordinary earth or clay for plugging of any breach caused in canal, nala, drain, water body, etc., to deal with any disaster or flood like situation upon orders of District Collector or District Magistrate.
11. Activities declared by State Government under legislations or rules as non- mining activity with concurrence of the Ministry of Environment, Forest and Climate Change, Government of India.

STANDARD ENVIRONMENTAL CONDITIONS FOR SAND MINING

Impact Category	S.No.	Environmental Conditions
Stakeholder Engagement	1	In the case of private land not owned by the lease holder an affidavit should be obtained regarding consent of the concerned land owner (s) for carrying out the mining operation.
	2	Stakeholder awareness and ability to raise concerns and getting it to be addressed.
	3	Implementation of Action Plan on the issues raised during the Public Hearing. The Proponent shall complete all the tasks as per the Action Plan submitted with the budgetary provisions during the Public Hearing.
	4	Having valid lease and all the permits is very much needed.
	5	To establish a Monitoring Committee including Local Panchayat, to check on traffic due to transportation and submit an annual report on the same.
	6	The directions given by the Hon'ble Supreme Court of India vide order dated 27.02.2012 in Deepak Kumar case [SLP(C) Nos. 19628-19629 of 2009] and order dated 05.08.2013 of the Hon'ble National Green Tribunal in application No. 171/2013 may be strictly followed.
	7	All the provisions made and restrictions imposed as covered in the Minor Mineral Rule, shall be complied with, particularly regarding Environment Management Practices and its fund management and Payment of compensation to the land owners.
Sustainable Mining Practices	8	District level Survey Report should be prepared and area suitable for mining and area prohibited for mining be identified.
	9	The depth of mining in Riverbed shall not exceed one meter or water level whichever is less, provided that where the Joint Inspection Committee certifies about excessive deposit or over accumulation of mineral in certain reaches requiring channelization, it can go up to 3 meters on defined reaches of the River.
	10	No River sand mining be allowed in rainy season.
	11	To submit annual replenishment report certified by an authorized agency. In case the replenishment is lower than the approved rate of production,

		then the mining activity / production levels shall be decreased / stopped accordingly till the replenishment is completed.
	12	Ultimate working depth shall be up to 3.0 m from Riverbed level and not less than one meter from the water level of the River channel whichever is reached earlier. In hilly terrain this depth be preferably restricted to one meter.
	13	In River flood plain mining a buffer of 3 meter to be left from the River bank for mining.
	14	In mining from agricultural field a buffer of 3 meter to be left from the adjacent field.
	15	Mining shall be done in layers of 1 meter depth to avoid ponding effect and after first layer is excavated, the process will be repeated for the next layers.
	16	To maintain safety and stability of Riverbanks i.e. 3 meter or 10% of the width of the River whichever is more will be left intact as no mining zone.
	17	No stream should be diverted for the purpose of sand mining. No natural water course and/ or water resources are obstructed due to mining operations.
	18	No blasting shall be resorted to in River mining and without permission at any other place.
	19	Depending upon the location, thickness of sand, deposition, agricultural land/Riverbed, the method of mining may be manual, semi-mechanized or mechanized; however, manual method of mining shall be preferred over any other method.
Identification and Preparation of Mining Site	20	Mining should be done only in area / stretch identified in the District Level Survey Report suitable for mining and so certified by the Sub-Divisional Level Committee after site visit.
	21	Mining should begin only after pucca pillar marking the boundary of lease area is erected at the cost of the lease holder after certification by the mining official and its geo coordinates are made available to the District Level Committee.
	22	The top soil in case of surface land mining shall be stored temporarily in an earmarked site and concurrently used for land reclamation.

Monitoring the Mining of Mineral and its Transportation	23	The EC holder shall keep a correct account of quantity of mineral mined out, dispatched from the mine, mode of transport, registration number of vehicle, person in-charge of vehicle and mine plan. This should be produced before officers of Central Government and State for inspection.
	24	For each mining lease site the access should be controlled in a way that vehicles carrying mineral from that area are tracked and accounted for.
	25	The State / District Level Environment Committee should use technology like Bar Coding, Information and Communications Technology (ICT), Web based and ICT enabled services, mobile SMS App etc. to account for weight of mineral being taken out of the lease area and the number of trucks moving out with the mineral.
	26	There should be regular monitoring of the mining activities in the State to ensure effective compliance of stipulated EC conditions and of the provisions under the Minor Mineral Concessions Rules framed by the State Government.
Noise Management	27	Noise arising out of mining and processing shall be abated and controlled at source to keep within permissible limit.
	28	Restricted working hours. Sand mining operation has to be carried out between 6 am to 7 pm.
Air Pollution and Dust Management	29	The pollution due to transportation load on the environment will be effectively controlled and water sprinkling will also be done regularly.
	30	Air Pollution due to dust, exhaust emission or fumes during mining and processing phase should be controlled and kept in permissible limits specified under environmental laws.
	31	The mineral transportation shall be carried out through covered trucks only and the vehicles carrying the mineral shall not be overloaded. Wheel washing facility should be installed and used.
Management of Visual Impact	32	The mining operations are to be done in a systematic manner so that the operations shall create a major visual impact on the site.
Bio-Diversity Protection	33	Restoration of flora affected by mining should be done immediately. Twice the number of trees destroyed by mining to be planted preferably of indigenous species. Each EC holder should plant and maintain for lease period at least 5 trees per hectare in area near lease.
	34	No mining lease shall be granted in the forest area without forest clearance in accordance with the provisions of the Forest Conservation Act, 1980 and the rules made thereunder.

	35	Protection of turtle and bird habitats shall be ensured.
	36	No felling of tree near quarry is allowed. For mining lease within 10km of the National Park / Sanctuary or in Eco-Sensitive Zone of the Protected Area, recommendation of Standing Committee of National Board of Wild Life (NBWL) have to be obtained as per the Hon'ble Supreme Court order in I.A. No. 460 of 2004.
	37	Spring sources should not be affected due to mining activities. Necessary Protection measures are to be incorporated.
Management of Instability and Erosion	38	Removal, stacking and utilization of top soil in mining are should be ensured. Where top soil cannot be used concurrently, it shall be stored separately for future use keeping in view that the bacterial organism should not die and should be spread nearby area.
	39	The EC should stipulate conditions for adequate steps to check soil erosion and control debris flow etc. by constructing engineering structures
	40	Use of oversize material to control erosion and movement of sediments
	41	No overhangs shall be allowed to be formed due to mining and mining shall not be allowed in area where subsidence of rocks is likely to occur due to steep angle of slope.
	42	No extraction of stone / boulder / sand in landslide prone areas.
	43	Controlled clearance of riparian vegetation to be undertaken
Waste Management	44	Site clearance and tidiness is very much needed to have less visual impact of mining.
	45	Dumping of waste shall be done in earmarked places as approved in Mining Plan.
	46	Rubbish burial shall not be done in the Rivers.
Pollution Prevention	47	The EC holder shall take all possible precautions for the protection of environment and control of pollution.
	48	Effluent discharge should be kept to the minimum and it should meet the standards prescribed.
Protection of Infrastructure	49	Mining shall not be undertaken in a mining lease located in 200-500 meter of bridge, 200 meter upstream and downstream of water supply / irrigation scheme, 100 meters from the edge of National Highway and railway line, 50 meters from a reservoir, canal or building, 25 meter from the edge of State Highway and 10 meters from the edge of other

		roads except on special exemption by the Sub-Divisional level Joint Inspection Committee.
	50	For carrying out mining in proximity to any bridge or embankment, appropriate safety zone (not less than 200 meters) should be worked out on case to case basis, taking into account the structural parameters, location aspects and flow rate, and no mining should be carried out in the safety zone so worked out.
	51	Mining activities shall not be done for mine lease where mining can cause danger to site of flood protection works, places of cultural, religious, historical, and archeological importance.
Enhancement Road Safety	52	Vehicles used for transportation of sand are to be permitted only with **of** fitness and PUC Certificates.
	53	Junction at takeoff point of approach road with main road be properly developed with proper width and geometry required for safe movement of traffic by concession holder at his own cost.
	54	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 Guideliness with respect to complying with traffic congestion and density.
	55	No stacking allowed on road side along National Highways.
Closure and Reclamation of Mined Out Area	56	The Project Proponent shall undertake phased restoration, reclamation and rehabilitation of land affected by mining and completes this work before abandonment of mine.
	57	Restoration, reclamation and rehabilitation in cluster should be done systematically and jointly by each EC holder in that cluster. This should be appropriately reflected as EC condition in each EC in cluster.
	58	Site specific plan with eco-restoration should be in place and implemented.
Health and Safety	59	Health and safety of workers should be taken care of.
	60	Transport of mineral will not be done through villages / habitations.
	61	The Project Proponent shall make arrangement for drinking water, first aid facility (along with species specific anti-venom provisioning) in case of emergency for the workers.

	62	Project Proponent shall implement the Disaster Management Plan if the mine lease area is located in Seismic Zone-IV. Project Proponent shall appoint a Committee to have a check over any disaster to warn workers well before for the safety of the workers. Emergency helpline number will be displayed at all levels.
	63	Project Proponent shall appoint an Occupational Health Specialist for Regular and Periodical medical examination of the workers engaged in the Project and records maintained; also, Occupational health check-ups for workers having some ailments like BP, diabetes, habitual smokers, etc. shall be undertaken once in six months and necessary remedial/preventive measures taken accordingly. Recommendations of National Institute for Labour for ensuring good occupational environment for mine workers would also be adopted.
Monitoring the Impact of Mining	64	The Project Proponent shall report monitoring data on replenishment, traffic management, levels of production, River Bank erosion and maintenance of Road etc.
Mineral Conservation	65	Use of alternate material such as M-sand in place of natural River sand shall be encouraged in order to reduce stress on natural eco-system.

APPENDIX: TABLE - 1

REVENUE FROM SAND MINING IN STATES / UTs

(Rs. in crores)

Sl.No.	STATE / U.T	2012 - 2013	2013 - 2014	2014 - 2015
01	Andaman & Nicobar	0.073	0	0
02	Arunachal Pradesh	7	8	5
03	National Capital Territory of Delhi	0	0	
04	Himachal Pradesh	0.70	0.35	0.07
05	Jharkhand	4.25	3.04	0.07
06	Karnataka	23.74	15.33	25.99
07	Madhya Pradesh	184.93	179.41	172.53
08	Meghalaya	14.50	15.88	15.50 (as forest royalty from govt. contractors)
09	Mizoram	0.018	0.0475	0.0861
10	Puducherry	0.80	0.20	0.03
11	Rajasthan	173.36	252.06	134
12	Tamil Nadu	188.50	117.73	109.10
13	Uttar Pradesh	97.27	166.45	168.38

* States/UTs not mentioned have not provided the data.

APPENDIX: TABLE - 2

NUMBER OF MINING LEASES IN STATE

Sl.No.	STATE / U.T	In stream	Flood Plain	Sea Shore	Agricul-tural field	River	Total
01	Andaman & Nicobar						Nil
02	Andhra Pradesh						Nil
03	Haryana	5	12		7		31
04	Jammu & Kashmir					650	650
05	Jharkhand	10				387	397
06	Lakshadweep					1090	1090
07	Manipur						NIL
08	Meghalaya						NIL
09	Odisha						NIL
10	Punjab	2 + 80 Temporary Working Permit				73	155
11	Sikkim		85				85
12	Tripura	21	244		5		270

* States/UTs not mentioned have not provided the data.

APPENDIX: TABLE - 3

AVERAGE SIZE OF SAND MINING LEASES IN STATE / UT: 2014-15

(In Hectare)

Sl.No.	STATE / U.T	AVERAGE SIZE	SMALLEST MINING LEASE AREA	LARGEST MINING LEASE AREA
01	Andaman & Nicobar	NOT APPLICABLE		
02	Arunachal Pradesh	ONLY MINING PERMITS		
03	Himachal Pradesh	1.20	0.25	4.09
04	Jharkhand	0.25	0.13	87.38
05	Karnataka	5	5	19.42
06	Madhya Pradesh	8.52	0.30	306.98
07	Meghalaya	Mostly < 1.5 ha.		
08	Mizoram	NA		
09	Puducherry	NA		
10	Rajasthan	2 5 in Bikaner	24.82 2 in Bikaner	1901.89 5 in Bikaner
11	Tamil Nadu	29 leases < 10 ha.	14 leases of 10 - 15 ha.	42 leases > 15 ha.
12	Uttar Pradesh	25	5	200

* States/UTs not mentioned have not provided the data.

APPENDIX: TABLE - 4

AVERAGE PERIOD OF SAND MINING LEASES IN STATE / UT

(In Hectare)

Sl.No.	STATE / U.T	AVERAGE MINING LEASE PERIOD (YEARS)
01	Andaman & Nicobar	Not Applicable
02	Arunachal Pradesh	Only mining permit is given
03	Himachal Pradesh	5
04	Jharkhand	3
05	Karnataka	2
06	Madhya Pradesh	5 to 10
07	Meghalaya	No lease in operation currently
08	Mizoram	No mining lease in operation currently
09	Puducherry	One year permit
10	Rajasthan	5 20-30 years in Bikaner
11	Tamil Nadu	3
12	Uttar Pradesh	3

* States/UTs not mentioned have not provided the data.

APPENDIX: TABLE - 5

COMMON METHOD AND PRACTICE OF SAND MINING IN STATE / UT

Sl.No.	STATE / U.T	COMMON METHOD AND PRACTICE OF SAND MINING
01	Andaman & Nicobar	1. The Apex Court in its order dated 7.5.2002 in I.A. No. 502 in WP (C) No. 202 of 1995, had directed that extraction of sand be phased out @ minimum 20% per year on reducing balance basis to bring the sand mining to a level of 33% of the present level of mining within a maximum period of five years. 2. Since the level of extraction of sand in the territory in the year 2001-02 i.e. the base year, was 68909 cubic meter, the quantity of extractable sand is fixed at 22581 cubic meter. 3. The quantity of sea sand so allowed by MoEF is extracted from the identified and approved sites having such deposits on the sea beaches (identified accreting area) with adequate environmental safeguards so as to prevent any damage to the sensitive coastal eco-system including corals, turtle/ bird nesting sites and the protected areas. 4. The allotment of sea sand is made to the individuals by the Sand Allotment Committee constituted by the Lieutenant Governor under the Chairmanship of Chief Secretary who also heads the A&N CZMA. The quantum of sea sand allotted is fixed by the Committee on the basis of availability of sea sand and the number of applicants (local) applied for their bonafide use.
02	Arunachal Pradesh	1. Mining of sand restricted to foothills only that too for a very short period. Grant of mining lease is kept in abeyance, short term mining permits are issued to various Central and State agencies for carrying out developmental works under the strict supervision of the departmental officers.

* States/UTs not mentioned have not provided the data.

Sl.No.	STATE / U.T	COMMON METHOD AND PRACTICE OF SAND MINING
03	Himachal Pradesh	Manual. The mining lease areas are sanctioned on the river bed if the area is approved in survey document. The mining activities are allowed strictly in accordance with the approved working cum Environment Management Plan and after the environment clearance.
04	Jharkhand	Manual
05	Karnataka	Manual
06	Madhya Pradesh	Manual
07	Meghalaya	Hill quarrying in private areas
08	Mizoram	Extraction of sand limited mainly for domestic purpose in the state. The produce extracted illegally is seized as per the Mizoram Forest Act, 1955. Mining is only limited to river banks and riverbeds with improvised equipments like spade, shovel, small canoes, etc.
09	Puducherry	Manual
10	Rajasthan	In Rajasthan sand is available in seasonal streams and rivers except Chambal which is perennial but mining is banned because of Chambal Crocodile Sanctuary. Mining is done up to 3 meters and is open cast. It is filled in trucks either manually or semi mechanized method. In Bikaner no river exists and mining for sand is being done from palaeo-channel. In this palaeo-channel the sand deposit occurs at the depth of 5 meter to 20 meter below ground level with an over burden of 5 to 20 meters. The mining here is done open cast benching method, where overlying blown sand, gravel, pebble etc. is removed, the sand is further sieved, graded and washed upto 12 to 18 mesh size.
11	Tamil Nadu	Manual mining is carried out in certain quarries. In most of the sand quarries two poclains are used by the PWD.
12	Uttar Pradesh	Manual and Semi-mechanised

* States/UTs not mentioned have not provided the data.

APPENDIX: TABLE - 6

SUGGESTIONS / RECOMMENDATIONS FROM STATES / UTs FOR ENVIRONMENTALLY SUSTAINABLE SAND MINING

Sl.No.	STATE / U.T	SUGGESTIONS / RECOMMENDATIONS FOR ENVIRONMENTALLY SUSTAINABLE SAND MINING
01	Andaman & Nicobar	The quantum of extractable sand fixed at 22581 cubic meter should be enhanced. This limit has been fixed by the orders of Hon'ble Supreme Court subject to study by National Institute of Oceanography.
02	Arunachal Pradesh	1. For environmentally sustainable sand mining a strict and comprehensive sand mining policy need to be framed.
		2. River sand is becoming a scarce commodity and hence exploring alternative to it has become imminent. Manufactured sand is a good alternative both for fine as well as coarse sand used in concrete.
		3. Sand mining should be restricted to surface collection only without the use of heavy machinery.
		4. Due to turbulent and inaccessible nature of rivers flowing in the hilly terrains of the state, deposition of the sand in the river bed is very negligible and except for few quarries in the foothills and plains, most of the notified quarries are boulders and mining of sand is very negligible.
		5. In view of environment related issues the grant of mining lease for river bed minor mineral viz. sand, gravel, shingle, aggregate, boulder are kept in abeyance and extraction of these minerals is regulated only by grant of mining permits, that too not exceeding 3000 cubic meter in one permit.
		6. For scientific mining of sand and other minor minerals Guideliness has been prepared and accordingly Geo-Technical Committee has been constituted under the chairmanship of ADC/SDO in the district level to determine the quantity of quarriable mineral that can be safely removed and also to give technical clearance for notification of quarries of smaller size, preferably within one hectare.
03	Chhattisgarh	1. While attempting to prepare a model Guidelines / policy for the country, the differences that exist in different states may be taken into account. It may be tried to take all stakeholders along.

* States/UTs not mentioned have not provided the data.

Sl.No.	STATE / U.T	SUGGESTIONS / RECOMMENDATIONS FOR ENVIRONMENTALLY SUSTAINABLE SAND MINING
		2. To ease the process of EC granting, SEIAA may have benches across the State with each bench having a SEAC under it. Time bound clearance with ease of access and grant.
		3. Sand mining with use of machinery should be allowed.
		4. Road construction material like murram should be exempted from EC considering their local / pocket occurrences and impossibility of obtaining EC.
		5. Considering the traffic issue at urban areas and to reduce intermediaries like storage point dealers, night mining with adequate lighting should be allowed.
		6. To make the availability of sand from local rivulet / streams the river bank to in-stream mine area distance should be reduced from 10 meter to 3 meters.
04	NCT of Delhi	1. Location of sand mining should be identified by a committee comprising of revenue deptt., Irrigation Deptt., CGWB, SPCB, Forest Department and mining department. Mining area should distinctly be marked at site, before allowing mining.
		2. Depth of mining should be restricted to 3 mtrs or water level, whichever is less and that to from aggradation areas. The side slope of excavation should be less than 3:1.
		3. Requirement of sand and gravel should be reduced by utilization of construction and demolition waste. It requires not only legislative support but also awareness campaign among the society.
		4. Guidelines should be distinctly clear and easy to understand covring do's and don't during mining operation.
		5. Sufficient safe distance should be left between mining site and adjoining engineering structures like embankment, spurs, bed bars, bridges, reservoir and regulator etc.
		6. Security amount should be sufficient enough to compel the agency to carry out rehabilitation, corrective measures and to ensure strict compliance of conditions of lease. S.D. should be released after inspection of committee and recording of certificate that agency complied with the lease conditions.
		7. Mining may be carried out by state agency instead of private agaencies.

* States/UTs not mentioned have not provided the data.

Sl.No.	STATE / U.T	SUGGESTIONS / RECOMMENDATIONS FOR ENVIRONMENTALLY SUSTAINABLE SAND MINING
05	Himachal Pradesh	1. Working cum Environment Management Plan has been made mandatory. The mining activities are allowed after submission of environment clearance.
		2. In compliance of order of Hon'ble Supreme Court dated 27.02.2012 in Deepak Kumar case, the Himachal Pradesh has repealed its rules called the Himachal Pradesh Minor Mineral (Concession) and Mineral (Prevention of illegal mining, transportation and Storage) Rule, 2015 in accordance to the recommendation of the Ministry of Environment & Forest and rules circulated by the Ministry of Mines. Hence the State of Himachal Pradesh has complied with the above directions of the Hon'ble Apex Court,
		3. Therefore the condition of applicability of Environment Clearance on the area less than 5 hectare shall be exempted.
		4. Further keeping in view, the peculiar topography, geography and socio-economic fabric of the State, the condition for the minimum size of the lease should be exempted as the rivers are in youth stage forming different land forms, land holdings are less, population is thin and scattered and the demand of minor mineral is limited, which could be met out locally by exploiting local resources on the small scale.
06	Jammu & Kashmir	1. Uniform Guidelines be framed for sand mining and river bed mining as they cannot be segregated.
		2. Identification of sand belts be made in consultation with CGWB and while framing Guideliness CGWB may be taken on board.
		3. Sand mining leases less than 5 hectare be exempted from EC and comprehensive policy may be made for hilly states for easing the process of grant of lease.
07	Jharkhand	1. Machine should not be used in sand mining. Only manual mining should be done.
		2. The depth of mining shall be restricted to 3 meter / water level whichever is less.
		3. No mining should be carried out in proximity of any bridge / embankment.
		4. In-stream mining should not be allowed.
		5. Mining should be done in accordance with an approved mining plan.

* States/UTs not mentioned have not provided the data.

Sl.No.	STATE / U.T	SUGGESTIONS / RECOMMENDATIONS FOR ENVIRONMENTALLY SUSTAINABLE SAND MINING
		6. EC should be valid for settlement period subject to ceiling of five years.
08	Karnataka	1. Undertaking sand mining activity through a Government agency to be governed by District Level Sand Monitoring Committee headed by Deputy Commissioner.
		2. The area should be properly surveyed and mapped with the help of GPS to assign geo coordinates and accordingly erect boundary pillars so as to avoid illegal and unscientific mining.
		3. Depth of sand available may be indicated in a contour map using suitable drilled holes to ensure sand mining do not exceed one meter depth.
		4. Once thickness is established sand mining may be permitted to one meter depth where the thickness of sand is more than three meter deep. If the thickness of sand is less than three meter, sand mining shall not be permitted.
		5. Sufficient spacing shall be ensured from one block to another block and sufficient time gap shall be provided for replenishment before undertaking mining activity in the same block.
		6. Mining activity shall be restricted to only non-monsoon season and in the area that is exposed.
		7. No in-stream mining shall be permitted.
		8. No stream should be diverted for the purpose of sand mining. No natural water course and/ or water resources are obstructed due to mining operations.
		9. Site specific plan with eco-restoration should be in place.
		10. Sand mining shall be undertaken only by manual method without use of earth moving equipment such as JCB etc. Use of mechanized boats for sucking sand from in-stream area shall be strictly prohibited.
		11. Appropriate safety zones shall be maintained in proximity to any bridge / and / or embankment and other permanent structures. No sand mining shall be undertaken in such safety / buffer zones. Guideliness issued by the Ministry of Mines in this regard shall also be adhered to.
		12. The quarrying activity shall not intersect subterranean water level and ground water table.

* States/UTs not mentioned have not provided the data.

Sl.No.	STATE / U.T	SUGGESTIONS / RECOMMENDATIONS FOR ENVIRONMENTALLY SUSTAINABLE SAND MINING
		13. The top soil in case of surface land mining shall be stored temporarily in an earmarked site and concurrently used for land reclamation.
		14. Use of alternate material such as M-sand in place of natural river sand shall be encouraged in order to reduce stress on natural eco-system.
09	Madhya Pradesh	1. Geographical location of the state should be taken care of.
		2. Keep provision for extraction of sand from forest areas.
		3. Expedite the EC process.
		4. In inter-state boundary leases sand mining EC be giver by the SEIAA.
		5. Clear Guidelines for B-1, B2 be issued.
		6. Simplify cluster cases.
		7. Exempt mining leases of less than 5 hectare from EC.
10	Meghalaya	1. No sand mining within 3 kilometer from Protected area and Reserved Forest area.
		2. Advance royalty etc for entire quantity of mineral be realized in full.
		3. Only loose boulder and sand are allowed to be removed from the mid river stream leaving 15 meter on either side untouched.
		4. No collection of sand is allowed on 15 meter of either side of structures like bridge, culvert etc.
		5. No blasting allowed.
		6. No extraction of stone / boulder / sand in landslide prone areas.
		7. No stacking allowed on road side along national highways.
		8. No felling of tree near quarry is allowed.
		9. No transportation of forest produce (sand from forest area) is allowed after sunset.
		10. Export fee realized if sand is sent outside the state.
		11. Stone crusher cannot be installed without permission of DFO.
		12. Tree should be planted at quarry after completion of mining.
		13. Violation of above conditions will result in cancellation of permit and forfeiture of advance royalty already paid.
11	Mizoram	1. Extraction of sand from the forest may be permitted strictly as per mining plan approved by the Competent Authority and after getting necessary clearance under various acts related to the forest and environment.

* States/UTs not mentioned have not provided the data.

Sl.No.	STATE / U.T	SUGGESTIONS / RECOMMENDATIONS FOR ENVIRONMENTALLY SUSTAINABLE SAND MINING
12	Odisha	1. EC may be exempted for leases less than 5 hectare.
		2. EC should not be required for earth mining.
		3. Minor minerals even close to inter-state borders should be allowed to be cleared by the SEIAA.
		4. In case a river is forming boundary of states and mechanized mining of sand is causing tension in states it should be resolved at the national level.
13	Puducherry	1. Environment Clearance is issued by SEIAA, Puducherry strictly under the provisions of the EIA Notification, 2006 and subsequent amendments.
14	Rajasthan	1. The bajari mined out from river bed is filled back by the river itself during the next rainy season. So, nature itself reclaims the mined out area every year. The formation of bajari is a natural process in the river and it is also essential to remove bajari from the river bed to avoid silting. If the sand deposited in the river bed is not removed, it may cause change of river course and may also results in flood plains will be developed.
		2. Price control system adopted in Rajasthan. Sand is a essential commodity.
		3. The depth of mining should be restricted to 3 meters or above water table.
		4. Machinery having boom height more than 3 meter shall not be allowed in extraction of bajari.
		5. Size of mining leases be allowed below 5 hectare.
		6. In streams with low deposit of sand and if use is mostly local no mechanized mining should be allowed and EC should not be required.
		7. In larger deposits there should be semi-mechanised mining with EC.
		8. The sand (river and stream) in different categories, with their availability, use and size of the deposit. **Category A:** Small deposits in river and stream where thickness of sand bed is very less and sand is used locally in villages and towns only and no mechanical mining is done, in such areas restriction of obtaining Environment Clearance can be relaxed for manual mining.

* States/UTs not mentioned have not provided the data.

Sl.No.	STATE / U.T	SUGGESTIONS / RECOMMENDATIONS FOR ENVIRONMENTALLY SUSTAINABLE SAND MINING
		Category B: Large deposits, where in rivers and streams having thickness of sand bed is medium to large, sand mining, shall be allowed with semi mechanized manner after obtaining Environment Clearance. **Bikaner District:** Bikaner district is a desert terrain where ground water table is very deep. Bajari is excavated above water table and it does not affect the water table. In addition to this boulder, gravel and waste generated due to bajari mining is used in reclamation of pits. Hence environment is not adversely affected due to bajari mining.
15	Sikkim	1. Forest department is the nodal department for sand and stone extraction from the riverbed.
		2. Use of machines is prohibited.
		3. Quarrying sites are allotted to village youth cooperatives.
		4. For bigger companies quarry sites in forest area are allotted after FC.
		5. State Government has considerations for allotment of quarries for Border Road Organization and MoD.
		6. GoI can monitor mining in states through GIS.
16	Tamil Nadu	1. Excess sand deposits identified in the flood plains and in-stream areas only to be mined in order to safeguard and maintain ground water table.
		2. Sand mining operation has to be carried out between 6 am to 7 pm.
		3. Mining operation should be carried out in a systematic manner without affecting environment and ecology of the area.
17	Uttar Pradesh	1. Depth of mining cannot be more than 3 meter or water table whichever is less.
		2. Mining can be done in slices forming benches where bench height cannot be more than 1 meter and bench width cannot be less than 10 meter.
		3. A width of not less than 50 meter or 10% width of river can be restricted for mining activities from river bank. A condition can be imposed that mining will be done from river activities from river bank.
		4. SEIAA should be decentralized to expedite EC process. It can be decentralized to district or zonal level.

* States/UTs not mentioned have not provided the data.

Sl.No.	STATE / U.T	SUGGESTIONS / RECOMMENDATIONS FOR ENVIRONMENTALLY SUSTAINABLE SAND MINING
		5. Make EC conditions practical.
		6. Requirement of mining plan in river bed mining be done away with.
		7. There should not be requirement of EC for short term permit.
		8. The quantity of sand should not be fixed in EC as it leads to loss in revenue and illegal mining.
		9. Semi-mechanised form of sand mining be allowed.
		10. Sand mining to be exempted from EC as it takes 6-8 months and environment department do not have requisite work force to enforce EC conditions. A Guidelines for environmentally sustainable sand mining be framed and it can be complied by imposing it in the lease condition.
18	Uttarakhand	1. Area less than 5 hectare be exempted from EC.
		2. Use of machine be allowed for scientific mining and reducing the cost of production.
		3. RBM deposition in the lease should not be fixed for the entire lease period. RBM in lease area be assessed after rains every year.
		4. 70% of leases in state not operating for want of EC and these vacant lots are source of illegal mining.

* States/UTs not mentioned have not provided the data.

APPENDIX: TABLE - 7

BEST PRACTICE OF SAND MINING ADOPTED IN DISTRICT / STATE / UT

Sl.No.	STATE / U.T	DESCRIPTION OF BEST PRACTICES
01	Andaman & Nicobar	Institute of Ocean Management has been entrusted the task of identification of sand accreting sites.
02	Arunachal Pradesh	Mining of sand is restricted to foothills only that too for a very short period.
03	National Capital Territory of Delhi	In Delhi sand mining lease is granted by Revenue department. NOC from I&FC Deptt. Were issued with condition of limitation of depth, area of mining, operation timing limitation and limited period of NOC. Compliance of laid down conditions and monitoring is ensured by collector.
04	Himachal Pradesh	1. The mining activities on river beds are allowed strictly as per the provisions of river / stream bed mining policy as under.
		2. No river / stream bed mining shall be allowed without the recommendation of the Sub Divisional Level Committee constituted under the Chairmanship of Sub Divisional Magistrate having XEN PWD, Irrigation and Public Health, SPCB, DFO and Mining Officer as its member.
		3. Nor river / stream bed mining shall be allowed within 75 meter from the periphery of soil conservation works, nursery plantations, check dams or within the distance as recommended by the Sub-Divisional Committee whichever is more.
		4. No river / stream bed mining shall be allowed within 1/10th of its span or 5 meters from the banks or as specified by the Sub-Divisional Level Committee, whichever is more.
		5. Nor river / stream bed mining shall be allowed within 200 meters upstream and downstream of water supply scheme or as specified by the Committee whichever is more.
		6. Nor river / stream bed mining shall be allowed within 200 meters upstream and 200 to 500 meters downstream of bridges depending upon the site specific conditions.

* States/UTs not mentioned have not provided the data.

Sl.No.	STATE / U.T	DESCRIPTION OF BEST PRACTICES
		7. No approach road from PWD road shall be allowed to lease area unless lessee / contractor obtains written permission from XEN, PWD for making road leading to all intake places from the PWD road. 8. No boulders/ cobbles/ hand broken road ballast shall be allowed to be transported outside the State from river/stream beds. 9. No digging for more than 3 feet shall be allowed in river/ stream beds. 10. No blasting shall be allowed in river/stream beds.
05	Madhya Pradesh	1. In some districts the Cooperative Societies of Labour are doing the sand collection, loading and unloading work.
06	Tamil Nadu	Permission has been granted in favour of PWD for quarrying sand in the river Poramboke lands in 16 districts in the state of Tamil Nadu. Sand mining is being carried out by the PWD in the entire State.
07	Uttar Pradesh	U.P. Minor Mineral Concession Rules, 1963.

* States/UTs not mentioned have not provided the data.

APPENDIX: TABLE - 8

STATUS OF PROMULGATION OF RULE ON SAND MINING IN THE STATE / UT

Sl.No.	STATE / U.T	NAME OF RULE WITH YEAR OF PROMULGATION
01	Andaman & Nicobar	Indian Forest Act, 1927 as sand has been included as forest produce.
02	Arunachal Pradesh	APMMCR 2002 and made effective from 1.01.2003
03	Himachal Pradesh	1. River/Stream bed Mining Policy-2004.
		2. Himachal Pradesh Minor Mineral Policy-2013.
		3. Himachal Pradesh Minor Mineral (Concession) and Mineral (Prevention of illegal mining, transportation and storage) Rule, 2015.
04	Jharkhand	Rule 12 of Jharkhand Minor Mineral Concession (Amendment) Rule 2014.
05	Karnataka	Karnataka Sand Policy was brought out in the year 2011 and as such amendment to the Karnataka Minor Mineral Concession Rule 1994 were made in the year 2011 and a separate chapter IV B for sand mining was introduced under Rule 31-R. Further, as per the Hon'ble Supreme Court orders sated 27.02.2012 in SLP No. 19628-19629 between Deepak Kumar and State of Haryana and others and as per the model Guideliness issued by the Government of India for Environmental Management of Mining of Minor Minerals, amendment to the Karnataka Minor Mineral Concessions Rule 1994 were brought out on 16.12.2013 incorporating a new chapter II A applicable to all minor minerals on Systematic, Scientific Mining and Protection of Environment, wherein Quarrying Plan, Environmental Management Plan and Environment Clearance was made mandatory. Amendments to Rule 31- R were also made wherein the Government, PWD Department was entrusted with sand mining, storage and transportation, under the District Sand Monitoring Committee and Taluk Sand Monitoring Committee.
06	Madhya Pradesh	Rules have been framed as per the orders of Hon'ble Supreme Court for sand mining under M.P. Minor Mineral Rules 1996 and Sand Mining Policy 2015 is also formulated in the State.

* States/UTs not mentioned have not provided the data.

Sl.No.	STATE / U.T	NAME OF RULE WITH YEAR OF PROMULGATION
07	Meghalaya	No rules notified by the state on sand mining
08	Mizoram	Mizoram Forest Act, 1955, which came into force on 1.01.1956.
09	Puducherry	Puducherry Minor Minerals (Concession) Rules, 1977.
10	Rajasthan	RMMCR, 1986 Notification dated 2.11.2012: 1. First proviso of Rule 8(2) and first proviso of 17 (1) - Renewal of Bajari Mining Leases is not allowed. 2. Rule 16 (3) - Mining Leases of Bajari to be granted for 5 years. 3. Rule 18 (18) - Part surrender of lease area of Bajari not allowed. Notification dated 3.4.2013 - (First proviso Rule 7 (1)- Mining leases of Bajari to be granted only by way of tender or auction. Notification dated 12.07.2013 - (First proviso Rule 11 (2)) - Maximum area limit of 10 sq. km. not applicable for Bajari Mining Leases. Bikaner District: Chapter II of RMMCR, 1986 (last amended 12.07.2013).
11	Sikkim	Sikkim Forest (Allotment of Areas for Quarrying of Sand and Stone), 2006.
12	Tamil Nadu	1. As per G.O. Ms. No. 95 Industries (MMCI) Department dated 1.10.2003, a new Rule 38 A has been introduced in the Tamil Nadu Minor Mineral Concession Rules, 1959. Accordingly quarrying and sale of sand is being carried out by PWD in the state of Tamil Nadu since October 2003. 2. As per G.O. Ms. No. 158 Industries (MMIC) Department dated 25.08.2008, a new Rule 38 B has been introduced in the Tamil Nadu Minor Mineral Concession Rules, 1959. Accordingly transportation of sand outside the state not to be made. To regulate storage and transportation of sand a new Rule 38 C B has been introduced in the Tamil Nadu Minor Mineral Concession Rules, 1959 vide G.O. No. 32 Industries (MMIC) Department dated 11.02.2011.

* States/UTs not mentioned have not provided the data.

APPENDIX: TABLE -9

NORMAL DATES OF ONSET AND WITHDRAWAL OF SOUTH-WEST MONSOON

The India Meteorological Department, Nagpur, vide letter No. NAGPUR RMC /CS-312, dated 18th January,2016 has provided the period of Rainy Season viz. Normal dates of Onset and Withdrawal of Southwest Monsoon over India as state-wise and union territory- wise which are as below:-

States	Normal date of Onset of SW-Monsoon	Normal date of Withdrawal of SW-Monsoon
Andhra Pradesh	1st June	15th October
Arunachal Pradesh	5th June	15th October
Assam	5th June	15th October
Bihar	10th June	15th October
Chhattisgarh	10th June	15th October
Goa	5th June	15th October
Gujarat	15th June	15th September
Haryana	1st July	15th September
Himachal Pradesh	1st July	15th September
Jammu & Kashmir	1st July	15th September
Jharkhand	10th June	15th October
Karnataka	5th June	15th October
Kerala	1st June	15th October
Madhya Pradesh	15th June	1st October
Maharashtra	10th June	1st October
Manipur	1st June	15th October
Meghalaya	1st June	15th October
Mizoram	1st June	15th October
Nagaland	5th June	15th October
Odisha (Orissa)	5th June	15th October
Punjab	1st July	15th September
Rajasthan	1st July	1st September
Sikkim	5th June	15th October
Tamil Nadu	1st June	15th October
Telangana	5th June	15th October
Tripura	1st June	15th October

States	Normal date of Onset of SW-Monsoon	Normal date of Withdrawal of SW-Monsoon
Uttar Pradesh	15th June	1st October
Uttarakhand	15th June	1st October
West Bengal	10th June	15th October
Union territory	**Normal date of Onset of SW-Monsoon**	**Normal date of Withdrawal of SW-Monsoon**
Andaman and Nicobar Islands	20th May	15th October
Dadra and Nagar Haveli	10th June	1st October
Daman and Diu	10th June	1st October
Lakshadweep	1st June	15th October
Delhi	1st July	15th September
Puducherry	1st June	15th October

Note: The District Environment Impact Assessment Authority (DEIAA) in consultation with District Expert Appraisal Committee (DEAC) can make necessary changes as per local meteorological variations in this period of rainy season with respect to prohibition of River Sand Mining in the District.

ENSURING SUSTAINABLE SAND MINING FOR SUSTAINABLE DEVELOPMENT

A Major Initiative of Ministry of Environment, Forest and Climate Change for ensuring Environmentally Sustainable Sand Mining and Prevention of illegal Sand Mining.

{Notification No: SO No. 141 (E) dated 15.01.2016 and S.O. No. 190 (E) dated 20.01.2016 available at www.envfor.nic.in}

- Use of Satellite imagery to decide the site suitable for mining and quantity of sand which can be mined.
- Transit permit with tamper proof security features and tracking of mined out mineral.
- Monitoring of mined out mineral to prevent mining in excess of environmental clearance capacity.

- Delegation of power to grant environmental clearance for sand mining to an authority headed by District Magistrate.

- Intergration of power with District Authorities to grant environmental clearance and prevent illegal mining.

Note : Any information of mining without environmental clearance or against the norms prescribed in these notifications be reported at e-mail id: sandmining-moef@gov.in

Section-7

Special Conditions of Contract

1 Relevant CWC guidelines, IS codes, Dam safety Norms, etc. are to be strictly followed.

2 The contractor shall, in all matters arising in the performance of the contract, comply with, give all notices under, and pay all fees required by, the provisions of any national or state statue, ordinance or other law, or any regulation of any legally constituted public authority having jurisdiction over the work. The contractor shall obtain all permits, licenses, clearances or approvals required for work or any part of work, in reasonable time taking into account of time of delivery for completion of work.

3 Joint venture: As per Technical Bid.

4 All the approach/haul road required, to reach material source, work site, camp etc shall have to be constructed & maintained by the contractor, during the entire contract period, at his own risk and cost, for which no extra payment shall be made to the bidder.

5 The bidder shall provide one new 7 seater and two new 5 seater multi-utility-vehicle to the Employer in its name, for supervision / inspection and collection of soil/silt/sand sample during contract period at the Disposal of Engineer in charge starting from 30 days from date of agreement. The cost of POL, Driver and maintenance shall be borne by the bidder, for which no extra payment shall be made.

6 The bidder shall provide facility of camp office with basic furniture (one table, four chairs) and basic facility (potable water with RO & water cooler, electricity and Toilets etc) during contract period at near site, for which no extra payment shall made to the bidder.

7 Contractor will maintain a PMU cell well equipped with CCTV arrangements of yard where dredged material will be stored before dispatching to Processing plant.

8 Land for establishment of site office, field laboratory, machineries, yards, dykes, carriageway, haulage roads and for all other requirements which is necessary for execution of work will be arranged by contractor at his own cost.The contractor shall arrange land which will be required for its operation under this agreement at his own cost and resources. However, Employer land/ govt land, if any, may be used only after its prior permission from competent authority at the rate prescribed by the employer. Any structure (residential or office building) except plant & processing units either temporary or permanent (built on Employer land after prior permission) shall be the property of Employer & contractor shall hand over the same to Employer after completion of the agreement term.

9 The movement of equipment, machineries, plants or vehicles should not hinder the safe and free movement of Government staff and nearby villagers.

10 The employer doesn't guarantee the suitability or availability of any land required for the work or any access route or access road, and will not entertain claim for any such non-availability of land or access route. Employer will also not be responsible nor liable to pay compensation for any accident/mishappening or causality caused by labour or material or machinery. It will be solely borne by the contractor. The contractor shall engage a safety officer for implementation of such safety measures.

11 Use of explosive for the work is strictly prohibited.

12 The contractor will make all necessary right of way, access roads etc required for the work at his own cost.

13 The contractor shall comply all prevailing safety norms health and safety laws, environment laws, labour laws, fair wages law, and all other laws which are applicable for the execution of work.

14 The contractor shall prepare a detailed site environment plan (SEP) for the work site, base camp etc showing arrangements for disposal/dumping of excavated earth, and other waste, location of

fuel, oil and lubricants depots, sheds for equipment, labour housing facilities, site office, etc prior to the construction to the Engineer-in-charge.

15 The contractor shall maintain full record of labour, their working hours, wages, safety, health and welfare of persons engaged, any occurrence of accident, any occurrences of damage to property etc at his own cost.

16 A detailed survey, clearly indicating positions and area where material will be stacked and sheds built, carriageway, haulage roads, dykes' area, separation plant area, pipeline etc is to be conducted by contractor at his own cost and to be presented to Engineer-in-charge before actual commencement of work at site.

17 The contractor shall not deposit any material or machineries at such location which causes inconvenience or hindrance to natural drainage channels, and to movement of people or department people.

18 One copy of drawing/execution plan to be kept at site and will be available for inspection at any time

19 The contractor shall not change the existing natural course of rivers/ streams/nallah falling into the river and reservoir.

20 Minimum Assured Payment to the ERCPCL- This proposal is requested for reclaiming / restoring the storage capacity of Bisalpur dam, 95.84Mcum (153.34 Million Metric Ton) in 20 years without altering the existing salient features of the Bisalpur dam and bidding the per unit rate of dredged material, which will be payable by bidder to ERCPCL subject to minimum annual payment to ERCPCL as indicated below irrespective of quantity of dredged material. Additional payment beyond minimum assured annual payment shall be payable to ERCPCL as per computation shown in the table.

S.No.	Year	Minimum annual assured payment to be deposited with the department (in Lacs)	Rate Quoted by Bidder in Rs Per Metric Tonne of Dredged Material (the rate will be increased by 5% of previous year rate excluding royalties, all taxes, duties etc.	Computation of Additional Payment in addition to Minimum assured Annual Payment	
				Actual Quantity of Dredged Material in metric Tonne	Additional Payment against the Quantity Dredged (Only if amount computed is more than the minimum annual payment) in Lacs
1	2	3	4	5	6
1	I Year	225.25	R1	Q1	=(Q1*R1)/10^5-225.25
2	II Year	473.03	R2=1.05*R1	Q2	=(Q2*R2)/10^5-473.03
3	III Year	709.54	R3=1.05*R2	Q3	=(Q3*R3)/10^5-709.54
4	IV Year	946.05	R4=1.05*R3	Q4	=(Q4*R4)/10^5-946.05
5	V Year	993.35	R5=1.05*R4	Q5	=(Q5*R5)/10^5-993.35
6	VI Year	1043.02	R6=1.05*R5	Q6	=(Q6*R6)/10^5-1043.02
7	VII Year	1095.17	R7=1.05*R6	Q7	=(Q7*R7)/10^5-1095.17
8	VIII Year	1149.93	R8=1.05*R7	Q8	=(Q8*R8)/10^5-1149.93
9	IX Year	1207.43	R9=1.05*R8	Q9	=(Q9*R9)/10^5-1207.43
10	X Year	1267.80	R10=1.05*R9	Q10	=(Q10*R10)/10^5-1267.80
11	XI Year	1331.19	R11=1.05*R10	Q11	=(Q11*R11)/10^5-1331.19

12	XII Year	1397.75	R12=1.05*R11	Q12	=(Q12*R12)/10^5-1397.75
13	XIII Year	1467.63	R13=1.05*R12	Q13	=(Q13*R13)/10^5-1467.63
14	XIV Year	1541.02	R14=1.05*R13	Q14	=(Q14*R14)/10^5-1541.02
15	XV Year	1618.07	R15=1.05*R14	Q15	=(Q15*R15)/10^5-1618.07
16	XVI Year	1698.97	R16=1.05*R15	Q16	=(Q16*R16)/10^5-1698.97
17	XVII Year	1783.92	R17=1.05*R16	Q17	=(Q17*R17)/10^5-1783.92
18	XVIII Year	1873.11	R18=1.05*R17	Q18	=(Q18*R18)/10^5-1873.11
19	XIX Year	1966.77	R19=1.05*R18	Q19	=(Q19*R19)/10^5-1966.77
20	XX Year	2065.11	R20=1.05*R19	Q20	=(Q20*R20)/10^5-2065.11

The contractor shall submit monthly report of quantity dredged on 3rd day of every month wherein they will provide their dispatch data from previous month to the Engineer-in-Charge. On the basis of the report submitted by the contractor, Engineer-in-charge shall raise the bill on or before 7th day of the month. The contractor has to make payment to the department by 15 th day of the month. Thereafter, if contractor is unable to pay the within prescribed time, the interest shall be charged on the bill amount at 15% per annum (simple interest) for delay payment. If in a month no dredging is done or quantity of lesser amount than the minimum assured per month (annual assured/12) is extracted, Engineer In charge will generate a bill of monthly assured payment (annual assured /12).

21 In case of work stopped by Court or agitation, the minimum assured payment will be decided by procurement entity for the duration affected.

22 The measurements of work shall be recorded by as per the provisions in the Works manual & accounts code or any other prescribed method/ mechanism as decided by the Engineer.

23 Contractor will install on its own cost web based SCADA system & CCTV network with its control at site to monitor activities and SCADA to automized quantification of the material excavated/taken out from reservoir, separately quantification of sand & silt. Web Based SCADA system must be provided to the plants, which are used for the work. Contractor will submit the SCADA plan and get it approved from Procuring Entity.

- Separate panel for the SCADA system along with independent sensors other than sensors required for operation and controlling of the plant shall be installed at the plant site to facilitate the independent supervision by ERCPCL.
- The activities / progress can be seen online on web site.
- Data shall be directly accessible to ERCPCL at Jaipur office.
- All the sensors shall be calibrated properly and necessary calibration certificate along with validity period shall be produced by the concern to authority as and when required.
- Facility to display the location of plant on GIS map shall be provided.

24 Bidders to ensure that there is no violation of orders of any court/ High court/ Supreme Court and orders of the National Green Tribunal given in the related matters and orders given by the environmental department.

25 Bidder shall obtain any clearance, if required, from requisite organization at its own cost. Bidder shall also follow the directions given by any court/ High court/supreme Court / orders of the National Green Tribunal/ Central Government/ State Government without any implications towards Employer without affecting contract rate.

26 Bidder to satisfy regarding availability of working days for extraction of material. No over extraction /below natural river bed shall be allowed.

27 Bidder shall submit its extraction plan well in advance & any shifting of dredger/equipment etc shall be done with the prior approval of Engineer in charge.

28 For de-silting in dam reservoir, distance limit shall be prescribed by concerned Engineer -In Charge from dam body and intake points of PHED beyond which no desilting shall be allowed. Bidder shall strictly follow these limits. If there is violation of terms & conditions regarding safety of dams, desilting shall be immediately stopped. It is to be borne in mind by the Contractor that Dam / Project safety is of prime importance during extraction of silt and silt mixed sand from dam reservoir. All necessary precaution shall be taken by the Contractor not to cause any type of harm to the Dam / all structures/ Project during entire operation of extraction work. If it is observed that any type of harm is caused to the dam / structures/ project, then the contractor has to carry out repairing and restoration of damaged portion of dam / project at contractors' own cost as per the procedure laid down by the Government or to pay the amount as decided by the Department. It is sole responsibility of contractor if any sort of harm is caused to dam. Considering the dam safety, contractor is not allowed to award sub-contract to any person or society.

29 Bidder will assess silt load assessment every year during monsoon flow and intimate the results.

30 Bidder to ensure that siltation study shall be carried after 10 years and after completion of work of the desilting activity through some expert Agency like CSIR-NIO/CWPRS / MERI Nashik or equivalent institute as decided by the Employer to determine the de-siltation done and silt load so that there is no over exploitation of the material at any point of time. A copy of siltation study shall be submitted to the Department.

31 Facility to communicate the data or messages regarding any discrepancies in the set parameters during the Plant operation or any other technical information to both parties i.e. Department and Contractor on system shall be provided.

32 Measures for prevention & control of soil erosion and management of silt shall be undertaken. Protection of dumps against erosion, if any, shall be carried-out with geo textile matting or other suitable material. Bidder to ensure recovery of silt /sand free water back to reservoir after proper treatment.

33 Provisions stipulated in Rajasthan Mines and mineral policy and forest policy with all its amendment till date shall be followed/ observed.

34 It shall be ensured that desilting does not in any way disturb the turbidity, velocity and flow pattern of the river water.

35 Bidder shall pay for the water used from reservoir for its entire operations for washing sand, commercial &non-commercial usage to the Dam owner as per prescribed rate.

36 All royalties/taxes etc are to be borne by Contractor as per prevailing law.

37 It shall be ensured that there is no danger /deterioration to flora &fauna around reservoir from any activity related to works under this contract.

38 Desilting in areas identified/demarcated/locally known for habitation of any creature is prohibited.

39 Farmers are allowed to use extracted silt for their farms free of royalty charges. However, farmers have to cart the extracted silt to their farm at their own cost. Therefore, the contractor has to stack the extracted silt at the approved locality and in the manner as directed by the Engineer-in-Charge. The contractor will dispose off excess silt after taking approval from Engineer -in-Charge and shall submit silt disposal plan time to time. Contractor will follow the plan of temporary/ permanent storage/ utilization of the extracted silt. Failure of which will be liable for suitable action by the engineer in charge.

40 If the contract is stayed or cancelled due to the Hon'ble court orders/ NGT, prohibitory orders of Environment Department, Natural calamities, Dam safety issues, public interest issues or any circumstances whatsoever, then contractor is not entitled for any compensation from the Government. Also. Directives/ Guidelines/ Revised procedures etc regarding environmental

clearance etc received from the Central Government/ Competent Authorities shall be mandatory and binding on the contractor during the subsistence of contract. However, period for such stoppages shall be considered for extension of time only and determining the amount of Minimum assured charges.

41 Contractor is solely responsible for the safety & security of the sand /silt removed from the extracted sand mixed silt. It is compulsory to the contractor to install CCTV cameras at contractors own cost at location & as directed by the Department so as to prohibit the theft of sand.

42 The land required for stacking extracted silt mixed sand as well as place for process unit shall be arranged by the contractor on its cost. The employer shall only assist the contractor to acquire necessary permission of usage of provided land or to acquire/lease the private land at its own cost. However, the responsibilities of arranging land required for operation, stacking etc lies with the contractor.

43 It is presumed that farmer shall cart silt from stacking yard at their own cost. However, in case if the farmer does not cart silt at his cost, then contractor will dispose excess silt as per directions of Engineer in charge before 1st June every year for previous year.

44 Transport of sand shall be governed in accordance with prevailing transport rules of mineral.

45 If the dam area where desilting is to be carried out comes under residence zone of bird species, it shall be the responsibility of the contractor to ensured that bird species will be protected in all respect. Also care to be taken regarding cage culture and fisheries, shall not be disturb.

46 In case of reserved forest, it shall be ensured by the contractor that desilting shall be carried out with restoring surrounding forest around desilting area. Permission for desilting in any area of reserved forest /nearby shall be taken by bidder from concerned authorities at its own cost & any binding /condition imposed by such authority shall be binding to bidder including entire cost, if any. Discarded material shall not be thrown away in the forest area. Contractor shall be solely responsible for illegal dumping/ stacking etc. of the material on the area other than the area specified by the contractor in his plan and approved by the engineer in charge.

47 It shall be mandatory to the contractor to make appropriate measures after starting desilting operation at a location in the reservoir to avoid adverse effect on fish production.

48 It shall be mandatory to the contractor to inform Engineer –in –charge in writing details such as names and registered numbers of Dredgers, boats, barges used for desilting and transportation. If it is found that unregistered boats, dredgers and barges are used for desilting and transportation, penal action shall be taken against the contractor. If any restrictions / prohibitions etc. are imposed on the use of any specific machinery etc. by Hon'ble Court / NGT etc. contractor shall not be entitled for any monetary compensation for on account of such restrictions / prohibitions.

49 Precise desilting area shall be demarcated at site by the Engineer- In charge prior to desilting operations for proposal under consideration. If the contractor is found extracting silt/ sand mixed with silt, beyond the area demarcated by engineer in charge, then such extraction will be treated as illegal and the contractor will be liable for the penal action and or termination of the contract by the Department.

50 All necessary statutory clearances including Environmental clearance (if required) shall be obtained by the contractor before start of desilting operations. Expenditure on account of such statutory clearances / permissions etc. shall solely be borne by the contractor and no such claim / reimbursement etc. if any shall be paid to the contractor. Also no claims / losses / damages etc. shall be paid to the contractor on account of time taken / required for such statutory clearances / permissions. If any clearance is to be issued in the name of Employer then Government will extend necessary help & support to the contractor for getting the same. However all charges/studies/actions/directions by authority etc, if required, shall be paid/done/complied by the contractor.

51 No desilting shall be carried out in the safety zone of any bridge and or dam embankment. No desilting shall be carried out in the vicinity of natural / manmade archaeological sites.

52 The contractor shall obtain necessary prior permission of the competent authorities for drawl of requisite water (surface water and groundwater) if required for the project on prescribed rates.

53 Waste water, if any, shall be properly collected and treated so as to conform to the standards prescribed be MoEF/CPCB/RPCB.

54 No wildlife habitat will be infringed.

55 The wildlife (protection) Act, 1972 with all its amendments till date shall not be violated.

56 Transportation of materials shall be done by covering the trucks / tractors with tarpaulin or other suitable mechanism so that no spillage of mineral / dust takes place.

57 Appropriate mitigation measures shall be taken to prevent any kind of pollution in consultation with the Rajasthan Pollution Control Board. It shall be ensured that there is no leakage of oil and grease from the vehicles used for transportation.

58 Vehicular emissions shall be kept under control and regularly monitored. The silt/sand transportation shall be carried out through the covered trucks only and the vehicles carrying the silt / sand shall not be overloaded.

59 Special Measures shall be adopted to prevent the nearby settlements from the impacts of the desilting activities. Maintenance of roads through which transportation of silt / sand is to be undertaken shall be carried out regularly.

60 Dispensary facilities for first-aid shall be provided at site.

61 Occupational health surveillance program of the workers shall be undertaken periodically.

62 Provision shall be made for the housing the workers at site, if required, with all necessary infrastructure and facilities such as fuel for cooking, safe drinking water medical health care and sanitation etc.

63 Ambient air quality will be monitored at the site and the nearest habitation in the months January, April and November. Ambient air quality at the boundary of the precise silting area shall conform to the norms prescribed by MoEF, GOI.

64 Measure shall be taken for control of noise level to the limits prescribed by Central Pollution Control Board. The Water (prevention and control of pollution) Act, 1974 the air (Prevention and control of pollution) Act.1981 the environment (Protection) Act, 1986 and rules there under, Hazardous Wastes (Management and Handling) rules, 1989 and its amendments the public liability insurance Act, 1991 and its amendments shall be strictly followed by the bidder.

65 Priority of desilting in areas will be decided as per instruction from Engineer-In Charge.

66 Excavation shall not be carried out below natural ground levels. It is necessary to maintain daily register of total quantity of dredged material and sand quantity available from silt mixed sand extracted..

67 Testing:- Testing of silt shall be done to know the contents & usefulness to crop and the sand so obtained by the Quality Control Organisation of the department to determine the ratio.

68 In cases of any illegal desilting/transportation is noticed than action shall be taken against person concerned as per prevailing rule. FIR shall be lodged under appropriate section of Indian Penal Code and vehicles as well as desilted sand shall be seized and taken into the custody of govt. and royalty charges, fine shall be recovered. If it is found there are incidences of attack on govt officers/ employees and incidences of an organised crime, action shall be taken against such crime under respective act.

69 No claim will be entertained on account of getting less sand proportion in the silt removal from the submergence area during the tender operation period.

70 **The work will be awarded to the bidder offering highest rate to the Employer.**

71 No payment shall be made by the Department for the above said work. Contractor has to deposit the amount worked out as per his quoted rate and as elaborated at condition 21 above.

72 Fore closure of works by the Government If at any time after the execution of the Contract: the Employer shall for any reason whatsoever require the whole or any part of the work as specified in the tender to be stopped for any period or shall not require the whole or part of the work to be carried out at all or to be carried out by the Contractor, he shall give notice in writing of the fact to the Contractor who shall thereupon suspend or stop the work totally or partially as the case

may be. In any such case except as provided hereunder the Contractor shall have no claim to any payment or compensation whatsoever on account of any profit or advantage which he might have derived from the execution of the work in full but which he did not so derive in consequence of the full amount of work not having been carried out or on account of any loss that he may be put to on account of materials purchased or agreed to be purchased, or for unemployment of labour recruited by him. He shall not also have any claim for compensation by reason of any alterations having been made in the original specifications, drawings, design and instructions which may involve any curtailment of the work as originally contemplated. If the Contractor suffers any loss on account of his having to pay labour charges during the period of stoppage of work ordered under this clause, the Contractor shall, on application be entitled to the such compensation on account of labour charges as the employer whose decision shall be final may consider reasonable, provided that the Contractor shall not be entitled to any compensation on account of labour charges, if in the opinion of the employer, the labour could have been employed by the Contractor elsewhere for the whole or part of the period during which the stoppage of the work has been ordered as aforesaid.

73 Detailed daily measurement shall be recorded through SCADA system and shall be approved and verified by the competent authority from time to time. Bidder shall get calibration of such SCADA system periodically. In case of nonworking/malfunctioning of SCADA system, maximum quantity observed within last three months shall be taken for billing purposes.

74 The contractor shall submit monthly dispatch report on 3rd day of every month wherein they will provide their dispatch data from previous month to the Engineer-in Charge. On the basis of the report submitted by the contractor, Engineer-in-charge shall raise the bill on or before 7th day of the month. The contractor have to make payment to the department within 10 days of date of issue of bill. Thereafter, if contractor is unable to pay the bill within prescribed time, the interest shall be charged on the bill amount at 15% per annum (simple interest) for delay payment.

75 The contractor has to produce the Royalty receipts at the end of every month in lieu of the selling of sand extracted from the silt mixed with sand extracted under the agreement.

76 Liability of bidders for any damages done in or outside work area : Compensation for all damage done intentionally or unintentionally by Bidder's laborers whether in or beyond limits of Government property including any damage caused by the spreading of fire etc, shall be estimated by the Engineer-in-charge, or such other Officer as he may appoint and the estimates of the Engineer-in-charge, subject to the decision of the Superintending Engineer, on appeal, shall be final and the bidder shall be bound to pay the amount of the assessed compensation on demand, failing which the same will be recovered from the Bidder as damages in the manner prescribed in agreement or deducted by the Engineer-in-charge from any sums that may be due or become due from Government to the bidder under this contract or otherwise.

77 However, period of silt removal shall be 20 years which may further be extended by 5 years based on mutual agreement between Employer and Contractor.

78 The rate offered by the bidder shall be increased annually by 5% of previous year rate. The bidder shall pay all royalty charges, all type of taxes, duties. cess levies imposed by central, State Govt. and Local bodies etc. prevailing from time to time

79 The payments for each year of the additional contract period shall be based on mutual agreement between both the parties & shall be decided at the time of processing bidders application for extension of time.

80 The payment shall be accepted in the following instruments.

a. Demand Draft.

b. b. Cheque.

c. Transferred through Net banking/NEFT/RTGS/Debit card/Credit card or any other mode of online transfer in the Specified Account.

d. Any other mode as decided by Procuring Entity.

81 The Employer reserves all the rights to use reservoir for any purpose. Government reserves all the fishing rights, utilization of reservoir for water sports/tourism, deployment of floating solar panel etc and any activity related to such activities.

82 Bidder is advised to study flood occurrence & its mitigation pattern of the reservoir and plan its activity accordingly. Government reserves all rights to operate reservoir/release flood water/ control reservoir water levels, utilize water from reservoir/ restrict any activity any time to ensure safety of dam & its components including canal head works & PHED intake wells.

83 **EFFECTS OF CHANGES IN LAW**

The Contract price/rate specified in Bid Proposal Sheets of Bid document is excluding royalty charges, all type of taxes, duties, Cess, levies imposed by central, State Govt. and Local bodies etc. prevailing from time to time which are to be borne by the contractor only. Thus rate offered to the employer is net rate. If any rates of Tax are increased or decreased, a new Tax is introduced in India only or an existing Tax is abolished, or any change in interpretation or application of any Tax resulting from a change or Introduction in India only due to any National or State Statue, Ordinance, Decree or other law or any 'regulation or bye-law of any local or other duly constituted authority in India only, occurring in the preceding month of the last date of submission of bid document, in the course of the performance of contract, which was or will be assessed on the Contractor. Inconnection with the performance of the contact, an equitable adjustment of the Contract rate shall be made by contractor to fully take into account any such change by addition to the Contract Price or deduction there from, as the case may be. Further, no adjustment of the Contract rate shall be made on account of variation in deemed export benefits, if any.

84 Bidder shall get required dedicated HT or LT power line, water line, gas line, road, transportation mechanism or required utility connection etc at its own from the concern organization at the location desired by him and all such cost for these purposes shall be borne by contractor. However, if required, Employer/Department will provide requisite name and support at the cost of contractor.

4.4.1 Equipment

The Bidder shall provide adequate information to demonstrate clearly that it has the capability to meet the requirements for the key equipment listed in Section III (Evaluation and Qualification Criteria). **A separate Form shall be prepared for each item of equipment listed**, or for alternative equipment proposed by the Bidder.

S. No.	Name of Equipment and characteristics	Minimum Required Numbers	Availability			
			Owned	leased	To be procured	Age/ condition
1	Indian Registered Dredgers					
	Cutter suction type dredgers/inland cutter suction type dredgers	02				
	Grab/ Backhoe/Bucket type Dredgers	04				
2	Hopper barges with hopper capacity of at least 500 cubic meters.	4				
3	Sand Processing Plant enabled with Hydro cyclone Method having minimum feed 70 TPH	1				

Signature of Bidder / Authorised Signatory