RAPID ENVIRONMENTAL IMPACT ASSESSMENT REPORT & ENVIRONMENTAL MANAGEMENT PLAN FOR PROPOSED RIVER SAND MINING PROJECT AT REVENUE VILLAGES OF TEHSIL : NATHDWARA & DISTRICT: RAJSAMAND, RAJASTHAN

MINING LEASE AREA: 773.2797 Ha. (NON FOREST) PRODUCTION CAPACITY: 2.81 LTPA

STUDY PERIOD – POST-MONSOON (OCT-DEC 2013)

Proponent:
Mr. HIMMAT SINGH SHEKHAWAT
98, Roop Rajat Township, Phase-II, Pall Road, Jodhpur, Rajasthan.

Consultant:
Enviro Concept (I) Pvt. Ltd. (Environmental Engineer & Consultants)
1/3 A, Yudhister Marg, C-Scheme, Jaipur
Telefax: 0141-2223290, M: +919829118043
Mr. Himmat Singh Shekhawat  R/o 98, Roop Rajat Township, Phase-II, Pal road, Jodhpur (Raj) propose to develop a River Sand mining in, Revenue Villages (Covering 26 Villages) of Tehsil: Nathdwara, District: Rajasmand, Rajasthan having lease area of 773.2797 Ha with initially proposed capacity was 2.81 LTPA as per approved mining plan. The land form is mostly river bed and non-forest land. The River beds area is belong to Government land as per revenue records. Letter of intent (LOI) for mining lease for 773.2797 Ha areas has been granted in favor of Mr. Himmat Singh Shekhawat vide letter No. P10(3)Mine/Group-2/2013 dated 05.03.2013. TOR was granted vide letter No. No. J-11015/211/2013-IA.II (M) dated 14.10.2013. The goal of the project is to provide sand for various construction as well as Infrastrurals projects.

Baseline data collection i.e. Air Quality, Water Quality, Noise Quality, & Soil Quality were collected during Post Monsoon Period 2013 by Noida Testing Laboratories, Greater Noida (NABL Accredited Laboratories). Secondary data has been collected from Indian Meteorological Department, Jaipur (IMD), Water Resource Department, Central Ground Water Board, Forest & Census Department etc. A final Environmental Impact Assessment report was prepared to comply with the terms of reference (TOR). As per the provisions of Environmental Impact Assessment Notification dated 14-09-2006 issued by Ministry of Environment and Forests, Govt. of India; Public Hearing was conducted at 03.00 PM on 25.11.2014, in the premises of Panchayat Samiti Office, Village: Khamnor, Tehsil: Nathdwara District: Rajasmand, under the Chairmanship of ADM Shri Govind Singh Ranawat for, Proposed River Sand Mining Project located at Revenue villages of Tehsil: Nathdwara, District: Rajasmand, Rajasthan. Advertisement for conducting public hearing was published on 19.10.2014 in “Hindustan Times” & 20.10.2014 in “Danik Bhaskar”.

We are committed to follow the proposed EMP in this EIA Report as an Environment Policy of the Company.

We also hereby undertake that all the points raised in the TOR issued by MOEF are complied with I also undertake that the facts given in the Final EIA/EMP report are factually correct to the best of our knowledge.

Mr. Himmat Singh Shekhawat  Devendra Goyal
Project Proponent  EIA Coordinator
Date: 03-02-2015
## ABBREVIATION

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| 10.1.1 | ENVIRONMENTAL CLEARANCE |
| 10.1.2 | TERMS OF REFERENCE |
| 10.2 | BRIEF DESCRIPTION OF THE PROJECT |
| 10.2.1 | LAND USE PATTERN |
| 10.3 | ANALYSIS OF ALTERNATIVE SITES |
| 10.4 | DESCRIPTION OF THE ENVIRONMENT |
| 10.5 | ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES |
| 10.5.1 | NOISE ENVIRONMENT |
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### APPENDIX I

(See paragraph – 6)

**FORM 1**

(Revised as per notification of MoE&F Dated 01.12.2009)

#### (I) Basic Information:

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<td>Name of Project</td>
<td>River Sand Mining Revenue Villages of Tehsil: Nathdwara, District: Rajsamand, Raj.</td>
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<td>2</td>
<td>S. No. in the Schedule</td>
<td>As per the Gazette Notification dated 14th September, 2006, the project is classified as Category “-A-“ under item 1(A)</td>
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</table>
| 3      | Proposed Capacity / Length tonnage to be handled / command area/ Lease area/ number of wells to be drilled. | Lease area: 773.27 Hect.  
Capacity: **281400 TPA Say 2.81 LTPA as per Final Mining Plan**  
Initially Capacity: 280000 Ton as per Draft Mining Plan  
No wells need to be drilled. |
| 4      | New/Expansion/Modernization                                          | New                                                                   |
| 5      | Existing Capacity/Area etc                                            | -                                                                     |
| 6      | Category of Project i.e ‘A’ or ‘B’                                    | A                                                                     |
| 7      | Does it attract the general condition? If yes, please specify.        | No                                                                    |
| 8      | Does it attract the specific condition                                | No                                                                    |
| 9      | Location                                                              | Location of lease area:  
Latitude: 24°54’48.6”N to 25°01’12.9”N  
Longitude: 73°37’18.9”E to 73°56’09.7”E  
Khasra Nos. Khasra no details enclosed as **Annexure No. 3**  
Plot/ Toposheet No 45H/9, 45 H/13, 45G/12, 45 G/16  
Village Namana, Khedana, Kumariya Khera, Ulpura, Kothariya, Kallakhedi, Karjiya Ghati, Gunjol, Kuncholi, Kunthwa, Bagol, Gudla(Dhanyla), Dhanyla, Paneriyo Ki Madri, Joshiyo Ki Madri, Tantol, Sarsuniya, Khamnor, Molela, Khedi, Dabun, Saloda, Karai, Sema, Chota Bhanja and Bada Bhanja.  
Tehsil Nathdwara  
District Rajsamand  
State Rajasthan |
| 10     | Nearest railway station/ airport along with district in kms.          | Nearest Railway Station: Nathdwara (20 km)  
Nearest Airport : Dabok, Udaipur (40 km) |
<p>| 11     | Nearest Town,City,DistrictHeadquarters                                | Nearest Town: Nathdwara:20 km |</p>
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<td>Village Panchayats, Zilla Parishad, Municipal corporation, Local body (Complete Postal Address with telephone nos. to be given)</td>
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<td><strong>13</strong></td>
<td>Name of the applicant</td>
</tr>
<tr>
<td><strong>14</strong></td>
<td>Registered Address</td>
</tr>
<tr>
<td><strong>15</strong></td>
<td>Address for correspondence</td>
</tr>
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<td><strong>16</strong></td>
<td>Details of alternative Site examined, if any</td>
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<td><strong>17</strong></td>
<td>Interlinked Projects</td>
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<td><strong>18</strong></td>
<td>Whether separate application of interlinked projects has been submitted?</td>
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<td><strong>19</strong></td>
<td>If yes, date of submission</td>
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<tr>
<td><strong>20</strong></td>
<td>If, no reason</td>
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<td><strong>21</strong></td>
<td>Whether the proposal involves approval/clearance under; if yes details of the same and their status to be given.</td>
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<td><strong>22</strong></td>
<td>Whether there is any Government order/Policy relevant? Relating to the site?</td>
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<td><strong>23</strong></td>
<td>Forest land involved (hectares)</td>
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<tr>
<td><strong>24</strong></td>
<td>Whether there is any litigation pending against the project and/or land in which the project is propose to be set up?</td>
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- **Capacity corresponding to sectoral activity** (such as production capacity for manufacturing, mining lease area and production capacity for mineral production, area for mineral exploration, length for linear transport infrastructure, generation capacity for power generation etc.)

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<td>98, Roop Rajat Township, Phase-II, Pall Road, Jodhpur, Rajasthan.</td>
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<td><strong>15</strong></td>
<td>98, Roop Rajat Township, Phase-II, Pall Road, Jodhpur, Rajasthan.</td>
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<td><strong>16</strong></td>
<td>It is a site specific project. No need to alternative site examined. Letter of Intent enclosed as Annexure No. 2.</td>
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<td><strong>17</strong></td>
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<tr>
<td><strong>22</strong></td>
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<td><strong>23</strong></td>
<td>No forest land involved.</td>
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<tr>
<td><strong>24</strong></td>
<td>No</td>
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**NOTE:**

- **Final EIA / EMP Report for River Sand Mining Project at Tehsil: Nathdwara District: Rajsamand 2014-15**
- **District Headquarter:** Rajsamand
- **Zilla Parishad:** Rajsamand
- **Municipal Corporation:** Rajsamand
- **Name of the applicant:** Himmat Singh Shekhawat
- **Registered Address:** 98, Roop Rajat Township, Phase-II, Pall Road, Jodhpur, Rajasthan.
- **Address for correspondence:** 98, Roop Rajat Township, Phase-II, Pall Road, Jodhpur, Rajasthan.
- **Name:** Himmat Singh Shekhawat
- **Designation:** Owner
- **Address:** 98, Roop Rajat Township, Phase-II, Pall Road, Jodhpur, Rajasthan.
- **Pin Code:** 342008
- **Email:** s-c-i-l@hotmail.com, ecipl2015@gmail.com
- **Telephone:** 9314481827
- **Fax:** -
- **Details of alternative Sites examined, if any:** It is a site specific project. No need to alternative site examined. Letter of Intent enclosed as Annexure No. 2.
- **Interlinked Projects:** No
- **Whether separate application of interlinked projects has been submitted?** Not Applicable
- **If yes, date of submission:** No
- **If, no reason:** No
- **Whether the proposal involves approval/clearance under; if yes details of the same and their status to be given.** Not Applicable
- **The Forest (Conservation) Act, 1980**
- **The wild life (Protection) Act, 1972**
- **The C.R.Z Notification, 1991**
- **Whether there is any Government order/Policy relevant? Relating to the site?** No
- **Forest land involved (hectares):** No forest land involved.
- **Whether there is any litigation pending against the project and/or land in which the project is propose to be set up?** No
### (II) Activity

1. **Construction, operation or decommissioning of the Project involving actions, which will cause physical changes in the locality (topography, land use, changes in water bodies, etc.)**

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<th>Yes/No</th>
<th>Details thereof (with approximate quantities /rates, wherever possible) with source of information data</th>
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<td>1.1</td>
<td>Permanent or temporary change in land use, land cover or topography including increase in intensity of land use (with respect to local land use plan)</td>
<td>No</td>
<td>The area is river bed and mined out area will be replenished gradually during succeeding rainy season. Hence there will be no change in land use, land cover or topography of the area.</td>
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<td>Creation of new land uses?</td>
<td>No</td>
<td>No</td>
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<td>Pre-construction investigations e.g. bore houses, soil testing?</td>
<td>No</td>
<td>Not required.</td>
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<td>Construction works?</td>
<td>No</td>
<td>A small office will be hired or constructed in village.</td>
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<td>1.6</td>
<td>Demolition works?</td>
<td>No</td>
<td>Not required.</td>
</tr>
<tr>
<td>1.7</td>
<td>Temporary sites used for construction works or housing of construction workers?</td>
<td>No</td>
<td>Local workers will be deployed. Mine office to be constructed to supervise work.</td>
</tr>
<tr>
<td>1.8</td>
<td>Above ground buildings, structures or earthworks including linear structures, cut and fill or excavations</td>
<td>No</td>
<td>Excavation of river sand upto 3 mts depth.</td>
</tr>
<tr>
<td>1.9</td>
<td>Underground works including mining or tunneling?</td>
<td>No</td>
<td>Extraction of minerals will be done by open cast method, so no underground works will be carried out.</td>
</tr>
<tr>
<td>1.10</td>
<td>Reclamation works?</td>
<td>No</td>
<td>As this is the river bed mining reclamation work through natural process.</td>
</tr>
<tr>
<td>1.11</td>
<td>Dredging?</td>
<td>No</td>
<td>River bed upto 3 bgf from dry bed, Hence No dredging required.</td>
</tr>
<tr>
<td>1.12</td>
<td>Offshore structures?</td>
<td>No</td>
<td>Not required</td>
</tr>
<tr>
<td>1.13</td>
<td>Production and manufacturing processes?</td>
<td>No</td>
<td>Not required</td>
</tr>
<tr>
<td>1.14</td>
<td>Facilities for storage of goods or materials?</td>
<td>No</td>
<td>Minerals extracted will be loaded directly into trucks/dumpers. Hence no storage facility will be required.</td>
</tr>
<tr>
<td>1.15</td>
<td>Facilities for treatment or disposal of solid waste or liquid effluents?</td>
<td>No</td>
<td>No solid waste will be generated.</td>
</tr>
<tr>
<td>1.16</td>
<td>Facilities for long term housing of operational workers?</td>
<td>No</td>
<td>No such facilities for housing of operational workers is required because, local workers will be deploy.</td>
</tr>
<tr>
<td>1.17</td>
<td>New road, rail or sea traffic during construction or operation?</td>
<td>No</td>
<td>Not required.</td>
</tr>
</tbody>
</table>
1.18 New road, rail, air waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc? | No | Not required
---|---|---
1.19 Closure or diversion of existing transport routes or infrastructure leading to changes in traffic movements? | No | No closure/diversion of existing transport routes or infrastructure is required
1.20 New or diverted transmission lines or pipelines? | No | Not required
1.21 Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers? | No | No Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers required.
1.22 Stream crossings? | No | Not applicable
1.23 Abstraction or transfers of water form ground or surface waters? | No | Water is required for domestic usage & dust suppression which will be supplied through existing borewell located nearby areas.
1.24 Changes in water bodies or the land surface affecting drainage or run-off? | No | There will be no change in the water bodies or land surfaces.
1.25 Transport of personnel or materials for construction, operation or decommissioning? | No | Local people will be deployed.
1.26 Long-term dismantling or decommissioning or restoration works? | No | Not applicable.
1.27 Ongoing activity during decommissioning which could have an impact on the environment? | No | Not applicable.
1.28 Influx of people to an area in either temporarily or permanently? | No | Local people will be deployed.
1.29 Introduction of alien species? | No | No such Introduction of alien species is foreseen.
1.30 Loss of native species or genetic diversity? | No | As such no loss of native species or genetic diversity is expected.
1.31 Any other actions? | No | -

2. Use of Natural resources for construction or operation of the Project (such as land, water, materials or energy, especially any resources which are non-renewable or in short supply):

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Information/checklist confirmation</th>
<th>Yes/No</th>
<th>Details thereof (with approximate quantities /rates, wherever possible) with source of information data</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Land especially undeveloped or agricultural land (ha)</td>
<td>No</td>
<td>The activity will be done in the proposed mine lease area which is a river bed. No agricultural land is required.</td>
</tr>
<tr>
<td>2.2</td>
<td>Water (expected source &amp; competing users) unit: KLD</td>
<td>Yes</td>
<td>5 KLD, Water will be supplied through tanker water supply.</td>
</tr>
<tr>
<td>S. No.</td>
<td>Information/Checklist confirmation</td>
<td>Yes/No</td>
<td>Details thereof (with approximate quantities/rates, wherever possible) with source of information data</td>
</tr>
<tr>
<td>-------</td>
<td>-------------------------------------------------------------------------------------------------------------------</td>
<td>--------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>2.3</td>
<td>Minerals (MT)</td>
<td>Yes</td>
<td>Minerals will be excavated in this project about 2.81 LTPA.</td>
</tr>
<tr>
<td>2.4</td>
<td>Construction material – stone, aggregates, sand / soil (expected source – MT)</td>
<td>No</td>
<td>Not required</td>
</tr>
<tr>
<td>2.5</td>
<td>Forests and timber (source – MT)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>2.6</td>
<td>Energy including electricity and fuels (source, competing users) Unit: fuel (MT), energy (MW)</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>2.7</td>
<td>Any other natural resources (use appropriate standard units)</td>
<td>No</td>
<td>No other natural resources will be used.</td>
</tr>
</tbody>
</table>

3. Use, storage, transport, handling or production of substances or materials, which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Information/Checklist confirmation</th>
<th>Yes/No</th>
<th>Details thereof (with approximate quantities/rates, wherever possible) with source of information data</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Use of substances or materials, which are hazardous (as per MSIHC rules) to human health or the environment (flora, fauna, and water supplies)</td>
<td>No</td>
<td>Project operation will not involve use of any materials, hazardous to human health or environment.</td>
</tr>
<tr>
<td>3.2</td>
<td>Changes in occurrence of disease or affect disease vectors (e.g. insect or water borne diseases)</td>
<td>No</td>
<td>Not applicable</td>
</tr>
<tr>
<td>3.3</td>
<td>Affect the welfare of people e.g. by changing living conditions?</td>
<td>Yes</td>
<td>The proposed project will generate employment opportunities &amp; revenue to the state government.</td>
</tr>
<tr>
<td>3.4</td>
<td>Vulnerable groups of people who could be affected by the project e.g. hospital patients, children, the elderly etc.,</td>
<td>No</td>
<td>This project will not affect the vulnerable groups of people.</td>
</tr>
<tr>
<td>3.5</td>
<td>Any other causes</td>
<td>No</td>
<td>Not applicable.</td>
</tr>
</tbody>
</table>

4. Production of solid wastes during construction or operation or decommissioning (MT/month)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Information/Checklist confirmation</th>
<th>Yes/No</th>
<th>Details thereof (with approximate quantities/rates, wherever possible) with source of information data</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>Spoil, overburden or mine wastes</td>
<td>Yes</td>
<td>No overburden will be generated.</td>
</tr>
<tr>
<td>4.2</td>
<td>Municipal waste (domestic and or commercial wastes)</td>
<td>Yes</td>
<td>Domestic waste will be channelized to septic tanks followed by soak pit.</td>
</tr>
<tr>
<td>4.3</td>
<td>Hazardous wastes (as per Hazardous Waste Management Rules)</td>
<td>No</td>
<td>No hazardous wastes are envisaged.</td>
</tr>
<tr>
<td>4.4</td>
<td>Other industrial process wastes</td>
<td>No</td>
<td>No waste generated.</td>
</tr>
<tr>
<td>4.5</td>
<td>Surplus product</td>
<td>No</td>
<td>No surplus product generated.</td>
</tr>
</tbody>
</table>
4.6 | Sewage sludge or other sludge from effluent treatment. | No | Not generated. |
4.7 | Construction or demolition wastes. | No | No major construction activity will be done. |
4.8 | Redundant machinery or equipment | No | There will be no redundant machinery or equipment as the machinery will be movable and can be used some where else. |
4.9 | Contaminated soils or other materials | No | No contaminated soils are generated |
4.10 | Agricultural waste | No | No agricultural waste will produce. |
4.11 | Other solid wastes | No | No other solid waste generated except some gravels & bolders. |

5. **Release of pollutants or any hazardous, toxic or noxious substances to air (Kg/hr)**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Information/Checklist confirmation</th>
<th>Yes/No</th>
<th>Details thereof (with approximate quantities/rates, wherever possible) with source of information data</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1</td>
<td>Emissions from combustion of fossil fuels from stationary or mobile sources</td>
<td>Yes</td>
<td>The automobile emission will be occure due to diesel operated equipment and loading vehicles. Better maintainance of equipment will help to reduce such emissions.</td>
</tr>
<tr>
<td>5.2</td>
<td>Emissions from production processes</td>
<td>No</td>
<td>Not envisaged.</td>
</tr>
<tr>
<td>5.3</td>
<td>Emissions from materials handling including storage or transport</td>
<td>Yes</td>
<td>During loading some emission is expected</td>
</tr>
<tr>
<td>5.4</td>
<td>Emissions from construction activities including plant and equipment</td>
<td>Yes</td>
<td>Not applicable</td>
</tr>
<tr>
<td>5.5</td>
<td>Dust or odours from handling of materials including construction materials, sewage and waste</td>
<td>Yes</td>
<td>Not envisaged.</td>
</tr>
<tr>
<td>5.6</td>
<td>Emissions from incineration of waste</td>
<td>No</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>5.7</td>
<td>Emissions from burning of waste in open air (e.g. slash materials, construction debris)</td>
<td>No</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>5.8</td>
<td>Emissions from any other sources</td>
<td>No</td>
<td>Emissions from other source are not envisaged.</td>
</tr>
</tbody>
</table>

6. **Generation of Noise and Vibration, and Emissions of Light and Heat:**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Information/Checklist confirmation</th>
<th>Yes/No</th>
<th>Details thereof (with approximate quantities/rates, wherever possible) with source of information data with source of information data</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1</td>
<td>From operation of equipment e.g. engines, ventilation plant, crushers.</td>
<td>Yes</td>
<td>Due to operation of machinery there may be vibration and noise. Necessary PPEs (Ear Muffs) will be provided for the personnel working in high noise area.</td>
</tr>
</tbody>
</table>
6.2 From industrial or similar processes | No | No such process is proposed.
6.3 From construction or demolition | No | No construction or demolition work is proposed.
6.4 From blasting or piling | No | No blasting and piling is required as material is loose in nature.
6.5 From construction or operational traffic | No | There will be generation of noise and vibrations will be site specific and will not be transmitted outside of mining lease area. The noise level will be below the permissible limit owing to the green belt around mining premises.
6.6 From lighting or cooling system | No | None
6.7 From any other sources | No | None

7. Risks of contamination of land or water from releases of pollutants into the ground or into sewers, surface waters, groundwater, coastal waters or the sea:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Information/Checklist confirmation</th>
<th>Yes/No</th>
<th>Details thereof (with approximate quantities/rates, wherever possible) with source of information data</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1</td>
<td>From handling, storage, use or spillage of hazardous materials</td>
<td>No</td>
<td>There is no generation of hazardous material during mining process.</td>
</tr>
<tr>
<td>7.2</td>
<td>From discharge of sewage or other effluents to water or the land (expected mode and place of discharge)</td>
<td>No</td>
<td>Domestic discharge will be disposed through the soak pit.</td>
</tr>
<tr>
<td>7.3</td>
<td>By deposition of pollutants emitted to air into the land or into water</td>
<td>No</td>
<td>Not envisaged for mining area</td>
</tr>
<tr>
<td>7.4</td>
<td>From any other sources</td>
<td>No</td>
<td>Not envisaged</td>
</tr>
<tr>
<td>7.5</td>
<td>Is there a risk of long term build up of pollutants in the environment from these sources?</td>
<td>No</td>
<td>No long term pollutant anticipated</td>
</tr>
</tbody>
</table>

8. Risk of accidents during construction or operation of the Project, which could affect human health or the environment

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Information/Checklist confirmation</th>
<th>Yes/No</th>
<th>Details thereof (with approximate quantities/rates, wherever possible) with source of information data</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.1</td>
<td>From explosions, spillages, fires etc from storage, handling, use or production of hazardous substances</td>
<td>No</td>
<td>No explosives or hazardous substances will be used.</td>
</tr>
<tr>
<td>8.2</td>
<td>From any other causes</td>
<td>No</td>
<td>Adequate measures for safety will be taken during operation stage.</td>
</tr>
<tr>
<td>8.3</td>
<td>Could the project be affected by natural disasters causing environmental damage (e.g. floods, earthquakes, landslides, cloudburst</td>
<td>No</td>
<td>The area is classified as Zone II (least to moderate) by Bureau of Indian standards (BIS) for earthquake sensitivity.</td>
</tr>
</tbody>
</table>
9. Factors which should be considered (such as consequential development) which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Information/Checklist confirmation</th>
<th>Yes/No</th>
<th>Details thereof (with approximate quantities/rates, wherever possible) with source of information data</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.1</td>
<td>Lead to development of supporting, ancillary development or development stimulated by the project which could have impact on the environment e.g.: • Supporting infrastructure (roads, power supply, waste or waste water treatment, etc.) • housing development • extractive industries • supply industries • other</td>
<td>No</td>
<td>Nil Nil Nil Nil</td>
</tr>
<tr>
<td>9.2</td>
<td>Lead to after-use of the site, which could have an impact on the environment</td>
<td>Yes</td>
<td>There could be water logged for sometime during rainy season.</td>
</tr>
<tr>
<td>9.3</td>
<td>Set a precedent for later developments</td>
<td>No</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>9.4</td>
<td>Have cumulative effects due to proximity to other existing or planned projects with similar effects</td>
<td>No</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

(III) Environmental Sensitivity

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Areas</th>
<th>Name/Identity</th>
<th>Aerial distance (within 15 km.) Proposed project location boundary</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value</td>
<td>No</td>
<td>Not applicable</td>
</tr>
<tr>
<td>2</td>
<td>Areas which are important or sensitive for ecological reasons - Wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains, forests</td>
<td>Banas &amp; Lapli</td>
<td>The project lies on this river.</td>
</tr>
<tr>
<td>3</td>
<td>Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration</td>
<td>No</td>
<td>Not applicable</td>
</tr>
<tr>
<td>4</td>
<td>Inland, coastal, marine or underground</td>
<td>No</td>
<td>Not applicable</td>
</tr>
<tr>
<td></td>
<td>waters</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>----------------------------------------------------------------------</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>5</td>
<td>State, National boundaries</td>
<td>No</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>6</td>
<td>Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas</td>
<td>No</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>7</td>
<td>Defence installations</td>
<td>No</td>
<td>Nil</td>
</tr>
<tr>
<td>8</td>
<td>Densely populated or built-up area</td>
<td>No</td>
<td>No scattered population</td>
</tr>
<tr>
<td>9</td>
<td>Areas occupied by sensitive man-made land uses (hospitals, schools, places of worship, community facilities)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>10</td>
<td>Areas containing important, high quality or scarce resources (ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)</td>
<td>Yes</td>
<td>Rajsamand Lake Tourist Place: Shrinath Temple</td>
</tr>
<tr>
<td>11</td>
<td>Areas already subjected to pollution or environmental damage. (those where existing legal environmental standards are exceeded)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>12</td>
<td>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)</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

Date: 30-01-2015
Place: Jaipur

Signature of the Applicant
Himmat Singh Shekhawat
98, Rooprajat Township, Phase-11, Pall Road, Jodhpur, Rajasthan
Executive Summary

1.1 PROJECT DESCRIPTION

Mr. Himmat Singh Shekhawat, Jodhpur is propose to develop a River sand mine in, Revenue villages of Tehsil: Nathdwara, District: Rajsamand, State: Rajasthan having lease area is 773.2797 Ha., does not fall in forest land. It has been proposed to collect sand from the river bed (nadi & nallas). River beds areas are owned by Govt. of Rajasthan. Mining lease is award for fresh grant to state Mining Department for a period of 5 years with effect from the date of registration. Mining will be confined to the allotted lease area which lies on the river bed of Banas & Lapli River from which approximately 2.81 lac Ton per year of sand will be excavated and the cost of the project is Rs. 68 lac only.

Table 1.1 Salient features of the projects

<table>
<thead>
<tr>
<th>S.No</th>
<th>Particulars</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Project Name</td>
<td>River Sand Mining at Revenue village of Tehsil: Nathdwara, District: Rajsamand (Raj.)</td>
</tr>
<tr>
<td>2</td>
<td>Location</td>
<td></td>
</tr>
<tr>
<td>a</td>
<td>Village</td>
<td>Revenue villages of Tehsil: Nathdwara</td>
</tr>
<tr>
<td>b</td>
<td>Tehsil</td>
<td>Nathdwara</td>
</tr>
<tr>
<td>c</td>
<td>District</td>
<td>Rajsamand</td>
</tr>
<tr>
<td>d</td>
<td>State</td>
<td>Rajasthan</td>
</tr>
<tr>
<td>3</td>
<td>Latitude</td>
<td>24°54’48.6” to 25°01’12.9”</td>
</tr>
<tr>
<td>4</td>
<td>Longitude</td>
<td>73°37’18.9” to 73°56’09.7</td>
</tr>
<tr>
<td>5</td>
<td>Survey of India Topo-sheets No.</td>
<td>45H/9, 45H/13, 45G/12, 45G/16</td>
</tr>
<tr>
<td>6</td>
<td>Elevation Range</td>
<td>520 - 635 mRL</td>
</tr>
<tr>
<td>7</td>
<td>Method of Mining</td>
<td>Open cast &amp; Semi-mechanized</td>
</tr>
<tr>
<td>8</td>
<td>Mineable Reserves</td>
<td>302.27 Lac Tonne</td>
</tr>
<tr>
<td>9</td>
<td>Lease Area</td>
<td>773.2797 Ha</td>
</tr>
<tr>
<td>10</td>
<td>Nearest Highway</td>
<td>NH-8</td>
</tr>
<tr>
<td>11</td>
<td>Nearest railway station</td>
<td>Nathdwara about 20 km</td>
</tr>
<tr>
<td>12</td>
<td>Nearest airport</td>
<td>Udaipur, Dabok (40 km)</td>
</tr>
<tr>
<td>13</td>
<td>Man Power</td>
<td>23</td>
</tr>
<tr>
<td>14</td>
<td>Project Cost</td>
<td>Rs. 68 Lac</td>
</tr>
<tr>
<td>15</td>
<td>EMP costs</td>
<td>Rs. 13.0 Lac</td>
</tr>
<tr>
<td>16</td>
<td>Cost towards CSR activities</td>
<td>Rs. 4.6 Lac</td>
</tr>
</tbody>
</table>

1.1.1 PROPOSED METHOD OF MINING

The mining process is opencast semi-mechanized river bed mining of minor minerals. Drilling and blasting is not required as the material is soft in nature. As per MMCR rules 1986 extraction is limited to 3.0 m depth only from the surface area when River bed is dry. Entire stretch of the lease area is around 50.0km long has been divided in to five block only for mining operation supervision management and safety. Mineral will be removed in 3.0 m layer only forming one bench. Bench will advance from South West to North East direction in the river. Height of bench will be 3.0 mt. Light
weight excavators will be deployed for extraction. Mineral will be loaded in trucks of 20 tones capacity trucks and equipment, earth movers will be on hire basis.

**LAND**
The proposed river sand mining spreads in an area of 773.2797 Ha, which is government land.

**WATER**
The water requirement in the mine is 5.0 KLD for mining activities, dust suppression, drinking purpose and greenbelt development.

**POWER**
All the activities will be carried out only during day time. Hence, no power is required.

1.2 DESCRIPTION OF THE PROJECT

Baseline environmental studies were conducted to monitor micro-meteorology, ambient air quality, ground and surface water quality, noise levels, present land use pattern, soil quality, biological environment and socio-economic status within a study area of 10 Km. radius around the mining lease area. Baseline environmental data was monitored by M/s Noida Testing Laboratory., Noida for one full season i.e. Post-Monsoon season, 2013 (October-November-December).

(I) **METEOROLOGY**

Micro-meteorological data of Udaipur (Dabok) has been obtained from Meteorological Centre, Sanganer, Jaipur for the Post-monsoon season–2013. The micro-meteorological status contains wind speed, wind direction, Dry bulb temperature, (max & min) relative humidity, rainfall etc. The met data collected were used to determine predominant meteorological conditions.

<table>
<thead>
<tr>
<th>Table 1.2 Climatology during Study Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average rainfall (in mm)</td>
</tr>
<tr>
<td>Temperature (°C)</td>
</tr>
<tr>
<td>Relative Humidity (At 08:30 hrs)</td>
</tr>
<tr>
<td>Relative Humidity (At 17:30 hrs)</td>
</tr>
<tr>
<td>Dominant Wind Direction</td>
</tr>
<tr>
<td>Average Wind Speed</td>
</tr>
</tbody>
</table>

(II) **AMBIENT AIR QUALITY**

Ambient air quality monitoring has been carried out with a frequency of two days per week at six locations. These are compared with the standards prescribed by Central Pollution Control Board (CPCB) for rural and residential zone. Results revealed that all the monitored parameters like (PM$_{10}$, NO$_2$, SO$_2$ & CO) were found within the prescribed limit. Ambient Air Quality Monitoring reveals that the concentrations of PM$_{10}$ for all the 6 AAQM stations were found between 61.65 to 80.0 g/m$^3$. As far as the gaseous pollutants SO$_2$ and NO$_2$ are concerned, the prescribed CPCB limit of 80 g/m$^3$ has never surpassed at any station. The concentrations of SO$_2$ were found in range of 6.14 to 15.0 g/m$^3$. The concentrations of NO$_2$ were found in range of 14.45 to 24.6 g/m$^3$. The Concentration of CO was found in range of 0.3 to 0.52mg/m$^3$.

(III) **GROUND WATER QUALITY**

The analysis results indicate that the pH ranges from 7.24 to 7.62 at all locations. The TDS (Total Dissolved Solids) was found in the range 486.82 to 495.07mg/L. It is seen that the physico-chemical analysis of other parameters like Chloride, Calcium, Magnesium, Nitrate and Fluoride were found within desirable limit of IS (10500:2012).

(IV) **WATER TABLE**
Depth of water table in this area is 1.08 to 20.99 mBGL.

(V) NOISE QUALITY
The daytime (L_{day}) noise levels at all the locations are observed in the range of 34.1 dB (A) to 53.7 dB (A). The maximum noise level of 53.7 dB (A) was observed at Kankroli and the minimum noise level of 34.1 dB (A) was observed at Kuncholi during the study period. It is observed that the day time noise levels are in accordance to the prescribed limits.

(VI) ECOLOGY
A general floral survey was carried out in the study area. Flora found in the 10 km study area are Khair (Acacia catechu), Semal (Bombax ceiba), Amaltas (Cassia fistula), Neem (Azadirachta indica), Castor (Ricinus communis) Cotton Tree (Bombax ceiba), Peeple, Babul (Acacia nilotica), Ardu (Ailanthus excels). Fauna: Red-wattled lapwing (Vanellus cinereus), Rock pigeon (Columba livia), Green bee-eater (Merops orientalis), Laughing dove (Streptopelia senegalensis), House crow (Corvus splendens) Indian Hare (Lepus nigrillos)

There are no rare endemic, endangered species & threatened species of flora within the study area. Pavocristatus (Peacock) & Common languor (Presbytis antellus) are the schedule-I & Schedule-II Fauna found in the Buffer area. Details are given in Chapter No: 4, at Point No: 4.14-4.17 of REIA/EMP Report. The flora and fauna study within 10 km radius is conducted and authenticated by DFO. There are no national parks, sanctuaries, tiger/ Elephant corridors, migratory route for birds etc.

There are no Ecologically Sensitive Areas present in the study area.

(VI) SOIL ENVIRONMENT
Six numbers of soil samples have been collected within study area and analyzed for physical and chemical properties. It has been observed that the soils are moderately alkaline in nature. Samples collected from identified locations indicate pH value ranging from 7.67 to 8.08, which shows that the soil is alkaline in nature. Organic Matter ranges from 0.53% to 0.89% in the soil samples.

(VII) SOCIO-ECONOMIC
Total population of the area is 195363 persons out of which 98284 (50.31%) are male and 97079 (49.69%) are female. The lease area falls in 26 villages where 25.59 percent of total population lives. Representation of Scheduled Cast and Scheduled Tribe population is only 10.93 and 23.17% respectively.

1.3 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES
1.3.1 IMPACT DUE TO AIR POLLUTION AND ITS MANAGEMENT
Air pollution is likely to be caused at various stages of sand mining operations such as excavation, loading, transportation and screening of material. Particulate Matter (PM_{10}) is the main pollutants during Sand mining operations. Most of the dust will be generated from loading and transportation operations. This dust becomes air borne and gets carried away to surrounding areas. The impact on air is mainly localized in nature as the dust particles are not carried to longer distances and the effect is felt within the core zone of the project involving active Sand mining operations.

In order to mitigate fugitive dust emissions and other air emissions from the project activities, the following measures are proposed to be adopted.

- To avoid fugitive dust emissions at the time of excavation, the mining area will be wetted by water spraying.
- Sand is transported to the nearest market by road through trucks. The sand will be wetted after loading in to the truck and will be covered by tarpaulin sheets.
To minimize the vehicular pollution from the sand transporting vehicles, the following conditions are insisted to permit the vehicles of the transporters:

- The vehicles will be with good engine condition and will be maintain pollution control certificate issued by appropriate authorities.
- Regular maintenance of transport vehicles and monitoring of vehicular emission levels at periodical intervals.
- Ambient Air quality Monitoring will be carried out at four stations to assess the air quality in and around the project for taking necessary control measures.
- Green belt development along the access roads at mine premises and near the villages.

1.3.2 IMPACT DUE TO NOISE POLLUTION AND ITS MANAGEMENT

Noise environment in this project will be affected only by the machineries at the site and vehicular transportation. Since mining is done semi-mechanically, slight increase in noise levels can be expected. Baseline Noise levels are observed well within the limits in the monitored villages. However, after applying the mitigation measures noise pollution will be reduced further.

In order to mitigate noise generation from the mining activities, the following mitigation measures are proposed:

a. Since the noise generating is only through mechanical equipment and movement of vehicles, strict compliance to periodical maintenance of the vehicle conditions will be insisted.

b. Further, to protect the employees and workmen at the sites of loading and use of Backhoe, necessary safety wear like ear plugs will be provided.

c. Noise monitoring at the work places will be carried out to ensure the compliance.

1.3.3 SOCIO-ECONOMIC ENVIRONMENT

The project activities will not have any adverse impacts on any of the common property resources of the village communities, as the sand mine lease area is not being used for any purpose by any section of the society in this region. There is no R & R involvement in this project. There is no land acquisition in this project. The Project is expected to yield a positive impact on the socio-economic environment. It helps sustain the development of this area including further development of infrastructure facilities.

1.4 ENVIRONMENT MONITORING PROGRAMME

An Environmental monitoring programme has been prepared for the proposed project for periodical assessment of effectiveness of implementation of Environment Management Plan. The monitored data on air quality, water quality, soil quality and noise levels, will be periodically examined for taking necessary corrective measures. The monitored data will be submitted to Rajasthan State Pollution Control Board (RSPCB). The post-project data will be submitted in half-yearly monitoring reports to the same.

1.5 PROJECT BENEFIT

The project activity will help in combating the growing demand of sand in the market & hence will help in the economic growth of the country. This project will lead to direct & indirect employment opportunity. Employment is expected during sand excavation, sand transportation, in trade and other ancillary services. Employment in these sectors will be primarily temporary or contractual and involvement of unskilled labor will be more. A major part of this labor force will be mainly from local villagers who are expected to engage themselves both in agriculture and project activities. This will enhance their income and lead to overall economic growth of the area.

1.6 ENVIRONMENTAL MANAGEMENT PLAN (EMP)
Environmental management plan will be proposed for “Sand” mining project to mitigate the anticipate impact during the mining operation.

1.6.1 AIR QUALITY MANAGEMENT
- Vehicles will be covered by tarpaulin to reduce spillage on roads.
- Regular checking & Maintenance of vehicles, trucks, dumpers etc, will be conducted and pollution under control (PUC) vehicle will be used during transportation.
- Periodically, water will be sprinkled on haul roads to wet the surface.
- Overloading of transport vehicles will be avoided to prevent spillage.
- Green belt of trees with good footage on both side of haul road.
- Dust mask provided to the workers engaged at dust generation points like excavations, loading and unloading points.
- Road will be properly maintained.

1.6.2 WATER QUALITY MANAGEMENT
- Mining will be carried out above the water table.
- Mining will not intersect the river water level or ground water table of the area.
- Mining schedule will be synchronized with the river flow direction and the gradient of the land.

1.6.3 NOISE MANAGEMENT
- Minimum use of horns and speed limit of 20 km/hour in the village area.
- Timely maintenance of vehicles and their silencers to minimize sound.
- Phasing out of old and worn out trucks.
- Provision of green belts in consultation with forest department along the road networks.

1.6.4 SOLID WASTE MANAGEMENT
There will be no generation of overburden/waste material. No backfilling has been proposed in the excavated zone of river to some extent will be replenished by sediment during rainy season.

1.6.5 GREEN BELT DEVELOPMENT & PLANTATION PROGRAMME
As the lease area falls in river bed, plantation & green belt development is not possible within the lease area. It is proposed that plantation will be carried out in the, along the approach roads, around Govt. buildings, schools in consultation with forest department. The Local species will be planted as per the CPCB guidelines.

1.6.6 SOCIO-ECONOMIC ENVIRONMENT
The implementation of the sand mining project will generate both direct and indirect employment. Besides, it will provide a check on existing system of mining operation. Since the quarries will be allotted on lease basis, mining operation will be legally valid and it will bring income to the state exchequer.

1.6.7 GREENBELT DEVELOPMENT
The following plant species will be planted according to CPCB guidelines: Cassia fistula(Amaltas), Delbergia sisso(Sisam), Mangifera indica (Mango), Acacia nilotica (Babul), Azadirachta indica(Neem), Albizia lebbek (Siris), Prosopis cineraria (Khejri), Delonix regia (Gulmohar), Butea monosperm (Palash), Phoenix sylvestris (Khajur), Peepal (Ficus religiosa) , Calotrops procera (Akada), etc. Trees shall necessarily be planted along the periphery of the area in rows.

Table 1.3 Greenbelt Programme

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of Sampling</th>
<th>Survival</th>
<th>Species</th>
<th>Place of Plantation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Year</td>
<td>800</td>
<td>560</td>
<td>Neem, Pipal,</td>
<td>Along the roads, in schools</td>
</tr>
</tbody>
</table>
1.7 CONCLUSION
As discussed, it is safe to say that the collection of minor mineral from River bed project is not likely to cause any significant impact on the ecology of the area as the mineral is replenishable and does not harm the environment and ecology of River and its surroundings.
Proper measures will be taken to control emissions likely to generate transportation of Mineral. Green belt development in the vicinity of river banks, along the approach roads, around Govt. buildings, schools will also be taken up as an effective pollution mitigative technique.

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### कार्यकारणी सारांश

1.0 परियोजना का विवरण

श्रीमान् हिम्मत सिंह शेखावत ने राजसमंद की तहसील नाथद्वारा के राजस्व गांवों के नदी-नालों से अप्रधान खनिज अर्थात बजरी के खनन का प्रस्ताव रखा है।

यह परियोजना 14 सितंबर 2006 के (पर्यावरणीय प्रभाव आंकन) अधिसूचना के तहत "ए" श्रेणी में वर्गीकृत की गई है। खनन पट्टा रजिस्ट्रेशन दिनांक से प्रभावी पाँच साल की अवधि के लिये दिया गया है। खनन कार्य आवंटित खनन क्षेत्र (773.2797 हेक्टेयर) तक ही किया जायेगा प्रतिवर्ष 2.81 लाख टन बजरी/रेत निकाली जायेगी।

### सारणी नं. 1.1

परियोजना की मुख्य विशेषतायें।

<table>
<thead>
<tr>
<th>क्र. सं.</th>
<th>विवरण</th>
<th>सविस्तार वर्णन</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>परियोजना का नाम</td>
<td>बजरी खनन, राजसमंद जिला तहसील नाथद्वारा के राजस्व गांव, राजस्थान</td>
</tr>
<tr>
<td>2.</td>
<td>स्थान</td>
<td>राजस्व गांव नाथद्वारा तहसील के राजस्व गांव</td>
</tr>
<tr>
<td></td>
<td>गांव</td>
<td>नाथद्वारा</td>
</tr>
<tr>
<td></td>
<td>तहसील</td>
<td>राजसमंद</td>
</tr>
<tr>
<td></td>
<td>जिला</td>
<td>राजस्थान</td>
</tr>
<tr>
<td>3.</td>
<td>अक्षांश देशांतर</td>
<td>24°54’48.6&quot; N से 25°01’12.9&quot; N तक</td>
</tr>
<tr>
<td></td>
<td></td>
<td>73°37’18.9&quot; E से 73°56’09.7” E तक</td>
</tr>
<tr>
<td>4.</td>
<td>ऊंचाई रेंज</td>
<td>520–635 एम एस एल से ऊंचाई</td>
</tr>
<tr>
<td>5.</td>
<td>खनन विधि</td>
<td>सेमी मेकनाइजड, ऑपन कार्ट विधि</td>
</tr>
<tr>
<td>6.</td>
<td>माइक्रोइल रिजर्व</td>
<td>302.27 लाखटन (पाँच वर्षों के लिये)</td>
</tr>
<tr>
<td>7.</td>
<td>खनन क्षेत्र</td>
<td>773.2797 हेक्टेयर</td>
</tr>
<tr>
<td>8.</td>
<td>निकटतम हाइवे</td>
<td>नेशनल हाइवे — एन.एच. 8</td>
</tr>
<tr>
<td>9.</td>
<td>निकटतम रेलवे स्टेशन</td>
<td>नाथद्वारा (20 किमी. दूर)</td>
</tr>
<tr>
<td>10.</td>
<td>निकटतम एयरपोर्ट</td>
<td>डबोक, उदयपुर (40 किमी. दूर)</td>
</tr>
<tr>
<td>11.</td>
<td>अम शोकत</td>
<td>23</td>
</tr>
<tr>
<td>12.</td>
<td>परियोजना लागत</td>
<td>68 लाख</td>
</tr>
<tr>
<td>13.</td>
<td>इ.पृ.पत. लागत</td>
<td>13 लाख</td>
</tr>
<tr>
<td>14.</td>
<td>सी.एस.आर. लागत</td>
<td>4.6 लाख</td>
</tr>
</tbody>
</table>

1.1 खनन की प्रस्तावित विधि

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D//FREIA/201503
ओपन कास्ट सेमी मेकनाइज्ड विधि से बजरी का खनन किया जायेगा। ड्रिलिंग और ब्लूटिंग की आवश्यकता नहीं है क्योंकि अप्रशंसन खनिज बजरी नस्ल प्रकृति की है। एम.एम.सी.आर. 1986 नियमानुसार 3 मीटर की गहराई तक ही खनन किया जायेगा। खनन क्षेत्र लगभग 50 किमी. लम्बा है। इसलिये पाँच ब्लॉक A, B, C, D & F में विभक्त किया गया है। बजरी को 3 मीटर की परत में एक बेंच के रूप में निकाला जायेगा। बेंच की ऊंचाई 3 मीटर की होगी। हल्की वजन के एकजातट खनन के लिये काम में लिये जायेंगे। बजरी को अधिकतम 20 टन क्षमता वाले ट्रक, ट्रैक्टर व ट्रोली में भरा जायेगा।

1.2 विज्ञानी, पानी और अन्य बुनियादी आवश्यकता
खनन क्रियाविधि दिन के दौरान ही की जायेगी। इसलिये विज्ञानी की आवश्यकता नहीं होगी। खदान में पानी की आवश्यकता 5 के.एल.डी. धूल दमन, पीने के लिये तथा ग्रीनबेल्ट विकास के लिये होगी जो कि ट्रेंकरों द्वारा उपलब्ध कराई जायेगी।

1.3 पर्यावरण का वर्णन
आधुनिक पर्यावरण अध्ययन, सूक्ष्म मौसम विज्ञान, परिवेशी वायु गुणवत्ता, जल गुणवत्ता, शोर तीव्रता, वर्तमान भूमि उपयोग, पूरा गुणवत्ता, जीविक पर्यावरण तथा सामाजिक आर्थिक पर्यावरण के लिये 10 किमी. क्षेत्र (तीन क्षेत्र से) किया गया है। बेसलाईन डाटा संग्रह पोस्ट मानसून (अक्टूबर–नवम्बर–दिसम्बर 2013) का मैस्य नोएडा टेस्टिंग लेबोरेट्री, नोएडा द्वारा किया गया है।

1.3.1 मौसम विज्ञान
राजस्थान में लिए गए मौसम विज्ञान को ऑक्सीज मौसम विभाग जयपुर से लिये गये है। सूक्ष्म मौसम संबंधी हवा की गति, हवा की दिशा, तापमान (अधिकतम, न्यूनतम) सापेक्षिक आंदोल, वर्षा आदि की स्थिति को शामिल किया गया है। जो ऑक्सीज मिले है वह मौसम की स्थिति निर्धारित करने के लिये इत्यादि किये गये है।

<table>
<thead>
<tr>
<th>सारणी नं. 1.2</th>
<th>अध्ययन अवधि के दौरान जलवायु</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. औसत वर्षा</td>
<td>0.0</td>
</tr>
<tr>
<td>2. तापमान (°C)</td>
<td>7.6–34.6</td>
</tr>
<tr>
<td>3. सापेक्षिक आंदोल (8.30 बजे)</td>
<td>30–85%</td>
</tr>
<tr>
<td>4. सापेक्षिक आंदोल(17.30 बजे)</td>
<td>19–70%</td>
</tr>
<tr>
<td>5. वायु दिशा</td>
<td>उत्तर पूर्व-दक्षिण पश्चिम</td>
</tr>
<tr>
<td>6. औसत वायु वेग</td>
<td>1.24 मी./से.</td>
</tr>
</tbody>
</table>

1.3.2 परिवेशी वायु गुणवत्ता
वायु परीक्षण के दौरान PM10, SO2, NO2 तथा CO की सांद्रता निर्धारित सीमा के अन्दर ही पाई गई है। परिवेशी वायु गुणवत्ता 6 स्थानों पर की गई तथा PM10 की सांद्रता 61.65 से 80.0 μg/m3 पाई गई। गैसीय प्रदूषक SO2 तथा NO2 CPCB की लिमिट 80μg/m3 के अन्दर ही पाई गई है। SO2 की
सांद्रता 6.14 से 15.0μg/m³ की रेंज में पाई गई। NO₂ की सांद्रता 14.45 से 24.6μg/m³ की रेंज में पाई गई। CO की सांद्रता 0.3 से 0.52mg/m³ की रेंज में पाई गई।

1.3.3 भू जल गुणवत्ता
छ: पानी के नमूने भू जल गुणवत्ता के लिये इकट्ठे किये गए। IS 10500%2012 के मानकों के अनुसार पानी के नमूनों का विश्लेषण किया गया। इसके अनुसार पी.एच. की सीमा 7.24 से 7.62 के बीच पाई गयी तथा टी.डी.एस. की सीमा 486.82 से 495.07 मिलीग्राम प्रति लीटर के बीच पायी गयी। सभी पैरामीटर जैसे क्लोराइड, कॅल्शियम, मैग्नेशियम और फ्लोराइड 10500:2012 की वांछनीय सीमा के भीतर ही पाये गये।

1.3.4 भू जल स्तर
भू जल स्तर मानसून से पूर्व 1.08 से 20.99 मीटर बी.जी.एल. पाया गया है।

1.3.5 ध्वनि गुणवत्ता
अध्ययन क्षेत्र में अधिकतम शोर तीव्रता 53.7 डी.बी.(ए). दिन के दौरान कांपकरोली तथा निम्नतम शोर तीव्रता 34.1 डी.बी.(ए) रात के समय गांव कुंडोली में पाई गई।

1.3.6 पारिस्थितिकी
10 किमी. के अध्ययन क्षेत्र में एक सामान्य स्थूलता किया गया जिसमें केंद्र, सेमल, अम्लतास, नीम, करोटी, कपास, लेप, बुलुल, अरुदु के वृक्ष पाए गए। जन्मू :— रेड वाल्ड लेपिंग, रोक विंग, ग्रीन बी ईंटर, लाफीगडव हाउस क्रो तथा इंडियन हेयर दिखे गए। प्रत्यावर्तित परियोजना से 10 किमी. की परिधि क्षेत्र के भीतर R & P वन अभायारण, बागोलिक आर्थिक, वन्यजीव कार्डिओर चीता/हाॅटी के लिये आर्थिक क्षेत्र अन्य कोई पारिस्थितिकी संवेदनशील क्षेत्र नहीं है। मौसम तथा लंगूर, भक्ष्य जोन में अनुसूची—I व II के जीव पाया गया है। विस्तृत अध्ययन रिपोर्ट के अध्ययन 4 के पैरा 4.11 में दिया गया है।

1.3.7 मृदा पर्यावरण
मृदा के छ: नमूनों अध्ययन क्षेत्र से इकट्ठे किये गये तथा भौतिक व रसायनिक गुणों की जोड़ की गई है। जिसके अनुसार PH की सीमा 7.67 से 8.08 के मध्य पाई गई जो कि मृदा की क्षारीय प्रकृति की दशकी है। कार्बनिक पदार्थ 0.53% से 0.89% की रेंज में पाया गया।

1.3.8 सामाजिक आर्थिक पर्यावरण
क्षेत्र की कुल जनसंख्या 195363 है जिसमें से 98284 (50.31%) पुरुष तथा 97079 (49.69%) महिलायें है। खनन क्षेत्र 26 गांवों में विभाजित है। जहाँ कुल जनसंख्या का 25.59% लोग रहते हैं। अनुसूचित जाति तथा अनुसूचित जनजाति की आबादी का प्रतिशत क्रमशः 10.93% तथा 23.17% है।

1.4 प्रत्यावर्तित पर्यावरणीय प्रभाव व कम करने के उपाय
1.4.1 वायु प्रदूषण के कारण व प्रबंधन प्राप्त वायु प्रदूषण बजरी खनन के दौरान, उत्खनन प्रक्रिया, लदान, परिवहन के कारण होगा। PM_{10} मुख्य वायु प्रदूषक होगा। डूल उत्सर्जक तथा वायु प्रदूषण को कम करने के लिये निम्नलिखित उपाय किये जायेंगे।

D//FREIA/201503
1. खनन क्रियाविधि के दौरान धूल उत्सर्जन को कम करने के लिये पानी का छिड़काव किया जाये।
2. ट्रकों द्वारा बजरी को तारपोल शीट से ढककर बाजार तक पहुँचाया जाये।
3. वाहनों से होने वाले प्रदूषण को कम करने के लिये निम्नलिखित शास्त्रीय प्रक्रियाओं का पालन किया जाये।
   A. वाहनों का इंजन अच्छी अवस्था में ही तथा प्रदूषण नियंत्रण प्रमाण पत्र उपयुक्त अधिकारी द्वारा प्रदान किया हो।
   B. परिवहन वाहनों की निरस्तर अंतराल में रखरखाव हो तथा वाहनों से उत्सर्जित होने वाले प्रदूषण की जीवंत समय पर हो।
4. परिवहन के वायु गुणवत्ता के जीवंत कम से कम चार स्थानों पर की जायेगी ताकि वायु गुणवत्ता परियोजना का आस-पास के क्षेत्र की निगरानी हो सके।
5. हरित पोटेंटियल का विकास सड़क तथा समीपतम गांवों में किया जाये।

1.4.2 वायु प्रदूषण के कारण तथा प्रबंधन प्रभाव
धन्य प्रदूषण के मुख्य स्रोत मशीनरी तथा वाहनों की आवाजाही होती है। खनन क्रियाविधि से मीटे मेकनाईज्ड विधि से की जायेगी जिससे मामूली धन्य स्तर में वृद्धि हो सकती है। बेसलाइन धन्य तीव्रता निर्धारित सीमा के अन्दर ही पाई गई है। हालांकि श्रेणी प्रदूषण को कम करने के लिये निम्नलिखित उपाय किये जायेंगे।

1. वाहनों की स्थिति अच्छी तथा नियमित रखरखाव किया जाये।
2. श्रंखला को ईंधन प्रपन दिये जायें।
3. श्रेणी ग्रुप की जीवंत समय-समय पर की जायेगी।

1.4.3 भू उपयोग प्रक्षेत्र एवं नदी प्रवाह में बदलाव पर प्रभाव
बजरी खनन, नदी के प्रवाह तथा दिशा के अनुसार ही किया जायेगा। खनन कार्य नदी/नालों में 3 मीटर गहराई या जल स्तर जो भी पहले हों तक ही किया जायेगा तथा उक्त खनन द्वारा नदी प्रवाह का प्राकृतिक बहाव अवरुद्ध नहीं किया जायेगा।

1.4.4 जल पर्यावरण पर प्रभाव
खनन गतिविधि भूजल स्तर से पर्याप्त ऊंचाई पर की जायेगी। इसलिये पानी के स्तर पर कोई प्रभाव नहीं होगा। खनन कार्य नदी-नालों में 3 मीटर की गहराई या भूजल स्तर जो भी पहले हों, तक ही किया जायेगा तथा उक्त खनन द्वारा नदी-नालों का प्राकृतिक बहाव अवरुद्ध नहीं होगा।

1.5 वैद्युतिक निगरानी कार्यक्रम
वैद्युतिक निगरानी कार्यक्रम प्रस्तावित परियोजना के लिये तैयार किया गया है। वायु गुणवत्ता, जल गुणवत्ता, धन्य गुणवत्ता तथा मृदा गुणवत्ता की जीवंत समय समय पर की जायेगी तथा देश में गुणवत्ता जीवंत RSPCB/MoEF को मैजी जायेगी। लक्षण द्वारा प्रदत्त पर्यावरण स्वीकृति की समी प्रशंसा का पालन किया जायेगा।

1.6 परियोजना के लाभ
प्रस्तावित परियोजना से बजरी की बजरी मांग की पूर्ति हो सकेगी जिससे पूरा करेगी क्षेत्र की आर्थिक स्थिति मजबूत होगी तथा विकास आगे बढ़ेगा इस परियोजना से समीपतम गांवों के
अकूल, कुशल श्रमिकों को रोजगार के अवसर प्रदान होगे तथा आर्थिक विकास में मदद मिलेगी।

इस परियोजना से प्रत्यक्ष तथा अप्रत्यक्ष रोजगार के अवसर मिलेंगे। रोजगार बजरी खनन, परिवहन के दौरान उपलब्ध होगे।

1.7 पर्यावरणीय प्रबंधन योजना

1.7.1 बायु गुणवत्ता प्रबंधन
- बजरी वाहनों को तिसराल से ढका जायेगा।
- वाहनों, ट्रकों, डिम्पर आदि की नियमित जॉच व रखरखाव किया जायेगा तथा पी.यू.सी. प्रमाणित वाहनों को ही परिवहन में लाया जायेगा।
- धूल के कणों को रोकने के लिये श्रमिकों को डस्ट मास्क दिये जायेगें।
- सड़कों का नियमित रखरखाव किया जायेगा।
- स्थानीय निकायों तथा वन विभाग के परामर्श से क्षेत्र में उचित स्थानों पर हरितपदलीका का विकास किया जायेगा।

1.7.2 जल गुणवत्ता प्रबंधन
- खनन कार्य जल स्तर से ऊपर किया जायेगा।
- खनन कार्य से नदी की जल गुणवत्ता तथा पृथ्वी के भीतर जल गुणवत्ता को प्रभावित नहीं करेगा।
- खनन कार्य नदी के प्रवाह तथा दिशा में अनुसार ही किया जायेगा।

1.7.3 ध्वनि प्रबंधन
- गांवों से जुड़ने वाले वाहनों को कम से कम हर्ष का उपयोग करने के निर्देश दिये जायेंगे तथा गांवों में वाहनों की गतिसीमा 20 किमी. /घंटा होगी।
- वाहनों तथा साइलेन्सर का समय समय पर रखरखाव किया जायेगा।
- पुसाने ट्रकों का उपयोग में नहीं लाया जायेगा।
- हरित प्लेटफर्म का विकास किया जायेगा।

1.7.4 ठोस कचरा प्रबंधन
प्रस्तावित खनन क्रियाविधि से ओवर बर्डन तथा अपशिष्ट पदार्थ का निकासन नहीं होगा। इसलिये पुनर्भरण की कोई आवश्यकता नहीं है। प्रत्येक वर्ष बारिश के दौरान बजरी का पुनर्भरण होगा।

1.7.5 हरित प्लेटफर्म का विकास तथा वृक्षारोपण कार्यक्रम
खनन क्षेत्र नदी तल में है। अतः धौहारोपण एवं हरित प्लेटफर्म का विकास खनन क्षेत्र में नहीं किया जा सकता है। अतः हरित प्लेटफर्म का विकास अप्रौंच रोड के दोनों तरफ, सरकारी स्कूल तथा गांवों तथा अन्य उचित स्थानों पर किया जायेगा। सीपीसी के मानकों के अनुसार स्थानीय प्रजातियों के पेड़ लगाये जायेगे। वन विभाग तथा स्थानीय निकायों के परामर्श से से किया जायेगा। सीपीसी की गाइडलाइन के अनुसार निन चोथे लगाए जाएगे केंद्रिय किस्टला (अमलतासा), डेल्फिनिया शियु (सिसम) मेन्जीफ्युरा इंडिका (आम), एक्स्ट्रीथा निलोटिका (बुबुल), अर्जुडिका इंडिका (पीम), एबबिजा लेबीन (सीरिस), जोसीपॉस साइजियरा(बेजेज़री), डेल्फिनिकास रेजिया (गुलमोहर), पल्सा फोनिस सिल्वेस्ट्रीस (खजुर), पीपल फाइकस रिलीजियोसा, केंद्रित्रीपीस प्रोपोस्त्रा (आक) इत्यादि। पेड़-पोधे क्षेत्र के चारों तरफ की परिधि में लगाए जायेगे।
सारणी नं. 1.3 हरित पद्धति का विकास

<table>
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<th>उत्तरजीवीता (70%)</th>
<th>योद्धारोपण का स्थान</th>
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<td>प्रथम वर्ष</td>
<td>800</td>
<td>560</td>
<td>रोड के दोनों तरफ, सरकारी जमीन पर कार्य किया जाएगा।</td>
</tr>
<tr>
<td>द्वितीय वर्ष</td>
<td>800</td>
<td>560</td>
<td>सामाजिक साधनों के लिए समर्थन प्रदान किया जाएगा।</td>
</tr>
<tr>
<td>तृतीय वर्ष</td>
<td>800</td>
<td>560</td>
<td>सामाजिक वाणिज्यिक योजना के लिए समर्थन प्रदान किया जाएगा।</td>
</tr>
<tr>
<td>चतुर्थ वर्ष</td>
<td>800</td>
<td>560</td>
<td>सामाजिक वाणिज्यिक योजना के लिए समर्थन प्रदान किया जाएगा।</td>
</tr>
<tr>
<td>पंचम वर्ष</td>
<td>800</td>
<td>560</td>
<td>सामाजिक वाणिज्यिक योजना के लिए समर्थन प्रदान किया जाएगा।</td>
</tr>
<tr>
<td>कुल</td>
<td>4000</td>
<td>2800</td>
<td>सामाजिक वाणिज्यिक योजना के लिए समर्थन प्रदान किया जाएगा।</td>
</tr>
</tbody>
</table>

1.7.6 सामाजिक आर्थिक पर्यावरण
प्रस्तावित परियोजना के क्षेत्र में विकास होना से प्रत्यक्ष एवं अप्रत्यक्ष रोजगार के अवसर मिलेगा। खनन पट्टा लीज पर आवंटित की गई है। खनन कार्य कानूनी रूप से मान्य होगा तथा राज्य के खजाने में भी वृद्धि करेगा।

1.8 सारणी
उपरोक्त विवरण के पश्चात यह कहना पूर्ण सार्थक होगा कि बजरी खनन परियोजना से मृत्यु की पारंपरिक स्थलों पर किसी प्रकार का दुष्प्रभाव नहीं पड़ेगा। चूंकि यह खनिज (बजरी) पुर्वितित है तथा खनन कार्य का कोई दुष्प्रभाव, नदी के पर्यावरण व पारिस्थितिक पर नहीं पड़ेगा।
खनिज वहन के द्वारा उत्पत्ति की रोकथाम हेतु उपाय अपनाये जायेंगे। सरकारी स्कूलों, पर्यावरण उद्योगों पर गांवों में हरित पट्टी का विकास किया जायेगा।

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CHAPTER-1

INTRODUCTION

1.1 PREAMBLE

Every anthropogenic activity has some impact on the environment. More often it is harmful to the environment than benign. However, mankind as it is developed today cannot live without taking up these activities for his food, security and other needs. Consequently, there is a need to harmonize developmental activities with the environmental concerns. Environmental Impact Assessment (EIA) is one of the tools available with the planners to achieve the above mentioned goal.

It is desirable to ensure that the development options under consideration are sustainable. In doing so, environmental consequences must be characterized early in the project cycle and accounted for in the project design.

Law requires that every project proponent must take Environmental Clearance from Ministry of Environment and Forests, New Delhi, before starting up any project. The environmental clearance is also mandatory for the expansion, modernization or renewal projects. The conditions are applicable as per the MoEF guidelines and EIA notifications issued and amended time to time.

There are many Acts/Rules & Notifications issued by MoEF, New Delhi for keeping the environment in and around project sites congenial for healthy/better standard of living. Few of them are mentioned below:

1. Environment (Protection) Act, 1986
2. Environment (Protection) Rules, 1986
3. Water (Prevention & Control of Pollution) Act, 1974
4. Air (Prevention & Control of Pollution) Act, 1981

As per the New EIA Notification dated 14 September, 2006, the mining project falls under category ‘A’, project activity 1(a) (3). Therefore, this project requires Environmental Clearance from MoEF, New Delhi. This mining project falls in category-A, as the total area of the project is 773.2797 Ha. The Environmental Impact Assessment (EIA) and Environmental Management Plan for “Mining of Minerals” as per the EIA Notification, 14th September 2006 has been prepared in accordance to Terms of reference (TOR) issued by the Ministry of Environment & Forest vide their letter No.-J-11015/211/2013-IA.II (M) dated 14.10.2013 and the Environmental Impact Assessment Guidance Manual published by MoEF for grant of environmental clearance with relevant project specific data.

All these mining projects are statutorily required to conduct Environmental Impact Assessment study for obtaining environmental clearance.

1.2 GENERAL INFORMATION OF MINES

Crushed stone, gravel and sand are one of the largest non-fuel mineral commodities by tonnage produced in Rajasthan, supplying some of the most important construction materials. Further, average unit value of crushed stone, sand and gravel is one of the lowest of all mineral commodities. This production of aggregate in a particular area is a function of the availability of natural resources, the size of population, the economy of the area and various developmental and infrastructural works being undertaken in the area like road construction, hydro-electric projects etc. Further, being a low
value, high-volume mineral commodity, the prices are dramatically affected by transportation distances. If the distances increase, the transportation cost may increase much more than the cost of the aggregates.

Although river bed deposits of sand stone & sand form significant resource that is seasonally replenished, their excessive extraction may cause scouring and erosion of river and other environmental problem. The extraction of river terrace deposits is alternative to riverbed mining. Substantial resources of sand and stone exists in river terrace beneath land assessed through geological/resource mapping and site exploration survey involving test pits, geophysical surveys, and sampling and laboratory studies.

1.2.1 RIVER SAND MINING & ITS USES
Sand Mining is a process of the actual removal of sand from the foreshore including rivers, streams and lakes. Sand is mined from beaches and inland dunes and dredged from river bed. These minerals typically occur combined with ordinary sand. The sand is dug up, the valuable minerals are separated in water by using their different density, and the remaining ordinary sand is re-deposited. River sand is vital for human well being & for sustenance of rivers. River sand is one of the world’s most plentiful resources (perhaps as much as 20% of the Earth’s crust is sand) and has the ability to replenish itself. As a resource, sand by definition is ‘a loose, incoherent mass of mineral materials and is a product of natural processes.’ These processes are the disintegration of rocks and corals under the influence of weathering and abrasion.

Sand has become a very important mineral for society due to its many uses. It can be used for making concrete, filling roads, building sites, brick-making, making glass, sandpapers, reclamations, and etc. The role of sand is very vital with regards to the protection of the coastal environment. It acts as a buffer against strong tidal waves and storm surges by reducing their impacts as they reach the shoreline. Sand is also a habitat for crustacean species and other related marine organisms. Sand also plays an important role in our tourism industry as it is an integral part of our beach attractions.

1.3 IDENTIFICATION OF PROJECT & PROJECT PROPONENT
The details of the project proponent are given below:
Name of Applicant- Mr. Himmat Singh Shekhawat
Address- 98, Roop Rajat Township,
Phase-II, Pal Road, Jodhpur (Raj)
a) Status of Applicant- individual
b) Mineral which applicant intends to mine – Bajri (River Sand) as minor mineral from river bed.
c) Period for which the mining lease is applied
Mining lease is given for a period of 05 years with effect from the date of registration by State Mining Department. Copy of LOI is enclosed as Annexure- I.

1.4 DESCRIPTION OF THE PROJECT
1.4.1 SIZE OF THE PROJECT
The total area of mine lease is 773.2797 Ha for mining of River Sand with a production capacity of 2.81Lac Ton/Year.

1.4.2 LOCATION OF THE PROJECT
The site is situated at Tehsil Nathdwar & District Rajsamand. The land of lease area belongs to following revenue villages:-
### Table 1.1 Villages Comes Under Lease Area

<table>
<thead>
<tr>
<th>Name of Village</th>
<th>Khasra nos.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Namana</td>
<td>1, 656, 657, 658</td>
</tr>
<tr>
<td>Khedana</td>
<td>1018, 428</td>
</tr>
<tr>
<td>Kumariya Kheda</td>
<td>1</td>
</tr>
<tr>
<td>Ulpura</td>
<td>47, 449</td>
</tr>
<tr>
<td>Kothariya</td>
<td>1, 128, 833</td>
</tr>
<tr>
<td>Karjiya Ghati</td>
<td>1</td>
</tr>
<tr>
<td>Gunjol</td>
<td>405, 412, 1372</td>
</tr>
<tr>
<td>Kuncholi</td>
<td>442, 1363, 1357, 1579/1574, 1586/1514</td>
</tr>
<tr>
<td>Kunthwa</td>
<td>429, 431, 2118</td>
</tr>
<tr>
<td>Bagol</td>
<td>1281</td>
</tr>
<tr>
<td>Gudla (Dhanya)</td>
<td>3012, 3452</td>
</tr>
<tr>
<td>Dhanya</td>
<td>2176/365</td>
</tr>
<tr>
<td>Paneriyo ki Madri</td>
<td>73, 487</td>
</tr>
<tr>
<td>Joshiyo ki Madri</td>
<td>1</td>
</tr>
<tr>
<td>Tantol</td>
<td>1,171</td>
</tr>
<tr>
<td>Sarsuniya</td>
<td>1, 231, 265, 609</td>
</tr>
<tr>
<td>Khamnoro</td>
<td>1, 304, 879, 915, 2058, 2276</td>
</tr>
<tr>
<td>Molela</td>
<td>5336, 6113</td>
</tr>
<tr>
<td>Khedi</td>
<td>2111</td>
</tr>
<tr>
<td>Dabun</td>
<td>1, 962, 957, 1845</td>
</tr>
<tr>
<td>Saloda</td>
<td>19, 1016, 1719</td>
</tr>
<tr>
<td>Karai</td>
<td>1749, 2266, 2678</td>
</tr>
<tr>
<td>Sema</td>
<td>2699, 3002, 3003, 3004, 3005</td>
</tr>
<tr>
<td>Chota Bhanuja</td>
<td>2796, 2848, 2941</td>
</tr>
<tr>
<td>Bada Bhanuja</td>
<td>43, 115, 157, 162, 317, 345, 360, 5019, 5020</td>
</tr>
</tbody>
</table>

The area of mining lease fall in survey of India Topo sheet no. 45H/9, 45H/13, 45G/12, 45G/16

### Table 1.2 Brief Description of the Project

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Particulars</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Nature of project</td>
<td>Mining Project</td>
</tr>
<tr>
<td>B</td>
<td>Size of project</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Mining Lease area</td>
<td>773.2797</td>
</tr>
<tr>
<td>2.</td>
<td>Proposed Production capacity</td>
<td>2.81 TPA</td>
</tr>
<tr>
<td>C</td>
<td>Project Location</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Village</td>
<td>As Above</td>
</tr>
<tr>
<td>4.</td>
<td>Tehsil</td>
<td>Nathdwara</td>
</tr>
<tr>
<td>5.</td>
<td>District</td>
<td>Rajsamand</td>
</tr>
<tr>
<td>6.</td>
<td>State</td>
<td>Rajasthan</td>
</tr>
<tr>
<td>7.</td>
<td>Latitude</td>
<td>24°54′48.6″N to 25°01′12.9″N</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>8.</td>
<td>Longitude</td>
<td>73°37'18.9&quot;E to 73°56'09.7&quot;E</td>
</tr>
<tr>
<td>9.</td>
<td>Toposheet No.</td>
<td>45H/9, 45 H/13, 45G/12, 45 G/16</td>
</tr>
<tr>
<td><strong>D</strong></td>
<td><strong>Environmental Settings Details</strong></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Nearest Town</td>
<td>Nathdwara</td>
</tr>
<tr>
<td>11</td>
<td>Nearest Highway</td>
<td>NH-8, SH-49</td>
</tr>
<tr>
<td>12</td>
<td>Nearest Railway Station</td>
<td>Nathdwara (20 km)</td>
</tr>
<tr>
<td>13</td>
<td>Nearest Airport</td>
<td>Udaipur, Dabok (40 km)</td>
</tr>
<tr>
<td>14</td>
<td>Ecological Sensitive Areas (National Park, Wild Life Sanctuaries, etc.)</td>
<td>Nil</td>
</tr>
<tr>
<td>15</td>
<td>Seismic Zone</td>
<td>Zone II</td>
</tr>
<tr>
<td><strong>E</strong></td>
<td><strong>Cost Details</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total Project Cost</td>
<td>68 Lac</td>
</tr>
<tr>
<td></td>
<td>Cost for Environmental Protection Measures</td>
<td>13.0 Lac</td>
</tr>
</tbody>
</table>

Fig. 1.1 Google Image of Proposed Project Site
1.5 ENVIRONMENTAL CLEARANCE PROCESS

Mining lease for mineral Bajri is proposed to be granted as provided in RMMC.(Amendment) Rules 2012 vide Notification F-14 (1) Mines/ Gr. II/ 2011 dated 23.05.2012.and as per Mines (Gr. II) Department Notification, Jaipur F-14 (1) Mines/ Gr. II/ 2011.Jaipur, dated 21st June’ 2012. As per these notifications it is mandatory to obtain Environmental Clearance for Minor Mineral (Bajri) as per the Notification of MoEF&CC,New Delhi. As per the 14th September 2006 Notification of the MoEF, mining projects of ML area >50 Ha is classified as “Category-A” projects and the authority for approval of TOR & issue/reject Environmental Clearance (EC) is Expert Appraisal Committee (EAC)/MoEF, New Delhi. The Environmental Clearance process for the order as:

1.6 TERMS OF REFERENCE (TOR)

The application for TOR of the Proposed River Sand Mining located in Revenue villages, Tehsil : Nathdwara, District Rajsamand, Rajasthan was submitted on dated 03.07.2013 and the same was considered in the 10th Reconstituted Committee of the Expert Appraisal Committee (EAC) meeting of MoEF scheduled on 21st – 23rd August, 2013 was accorded approval vide letter no. J-11015/211/2013-IA.II (M) dated. 14.10.2013, copy is enclosed as Annexure No.1.

Compliance to the Terms of Reference (TOR) is given in Table 1.3.

Table 1.3 Compliance Terms of Reference (TOR)

<table>
<thead>
<tr>
<th>S.No</th>
<th>TOR Condition</th>
<th>Compliance Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Year-wise production details since 1994 onwards should be given clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification, 1994 coming into force w.r.t the highest production achieved prior to 1994.</td>
<td>The letter of Intent was granted in the year March 2013, the details of production since then are given below:-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>S.No</th>
<th>Month &amp; Year</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>December 2013</td>
<td>1496</td>
</tr>
<tr>
<td>2</td>
<td>January 2014</td>
<td>18560</td>
</tr>
<tr>
<td>3</td>
<td>February 2014</td>
<td>11921</td>
</tr>
<tr>
<td>4</td>
<td>March 2014</td>
<td>9505</td>
</tr>
<tr>
<td>5</td>
<td>April 2014</td>
<td>3056</td>
</tr>
<tr>
<td>6</td>
<td>May 2014</td>
<td>1994</td>
</tr>
<tr>
<td>7</td>
<td>June 2014</td>
<td>11369</td>
</tr>
<tr>
<td>8</td>
<td>July 2014</td>
<td>2289</td>
</tr>
<tr>
<td>9</td>
<td>August 2014</td>
<td>7983</td>
</tr>
<tr>
<td>10</td>
<td>September 2014</td>
<td>7832</td>
</tr>
<tr>
<td>11</td>
<td>October 2014</td>
<td>9779</td>
</tr>
<tr>
<td>12</td>
<td>November 2014</td>
<td>5320</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------------------------------------------</td>
<td>-----------------------------------------------------------------</td>
</tr>
<tr>
<td>2</td>
<td>A Copy of the document in support of the fact that the proponent is the rightful lessee of the mine should be given.</td>
<td>LOI for Mining Lease for 773.2797 Ha area has been granted in favour of Mr. Himmat Singh Shekhawat vide letter No. प. 10(3)खान / गुप्त–2/ 2013 dated 05.03.2013 and copy of the same is enclosed as Annexure No. 2.</td>
</tr>
<tr>
<td>3</td>
<td>All documents including approved mine plan, EIA and public hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management and mining technology and should be in the name of the lessee.</td>
<td>All documents including approved Mine Plan, EIA and public hearing are compatible with one another in terms of the production levels, waste generation and its management and mining technology.</td>
</tr>
<tr>
<td>4</td>
<td>All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/toposheet should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).</td>
<td>All corner coordinates of mine lease area are superimposed on High Resolution Imagery/toposheet. Detail is given in FEIA/EMP report at Chapter 4, Figure no. 4.3.</td>
</tr>
<tr>
<td>5</td>
<td>Does the company have a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/violation of the environmental or forest norms/conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances/violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large may also be detailed in the EIA report.</td>
<td>The company through its well laid down Environmental Policy will bring into focus any infringement/deviation/violation of the Environmental norms/conditions. After commencement of the project in the area, project proponent would have developed or to establish an environmental management system of reporting of non-compliance/violation of Environmental norms. Details given in Chapter-9 of REIA/EMP report and Environmental Policy enclosed as Annexure No:17</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<tr>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Issues relating to Mine Safety, including subsidence study, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No underground mining will be done, which may create subsidence problems. Mining will be done up to 3 m from surface or 1 m above water level, whichever is earlier. So, Slope study is not necessary. No blasting is required. Proposed project is opencast Mining. Issues relating to mine safety &amp; Proposed safeguard given in Chapter: 7 of Final REIA/EMP Report.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc should be for the life of the mine/lease period.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The study area Comprise of 10 km zone from the periphery of the mining lease is given in chapter-4, figure no. 4.6. No overburden and waste is likely to be generated during lease period.</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any changes of land use should be given.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Land use map showing land use of study area is given in Fig No. 4.2, Chapter: 4 of REIA Report. A) There is no National Park, Wildlife Sanctuary, National Monument, Biosphere Reserves etc. within 10 km periphery of the mining lease area. B) There is no habitation within the lease area.</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&amp;R issues, if any, should be given.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No overburden and Solid waste will be generated from the proposed river sand mine. As the mining is in river bed classified as Gair Mumkin Nadi Nallah. Hence, no R &amp; R issues are involved.</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not applicable as there is no forest land involved in project.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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<tr>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td><strong>11</strong></td>
<td>Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>There is no forest land involved; hence no forest clearance will be required.</td>
<td></td>
</tr>
<tr>
<td><strong>12</strong></td>
<td>Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not Applicable as there is no Forest land involved in the project.</td>
<td></td>
</tr>
<tr>
<td><strong>13</strong></td>
<td>The vegetation in the RF/PF areas in the study area, with necessary details, should be given.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>There are some RF/ PF present in the study area which are as follow</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Open Mix Jungle  (about 9.0 km)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Open Jungle (about 3.5 km)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Open Jungle (about 9 km)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Open Mix Jungle (about 9.0 km)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. Protected Forest (about 5 km)</td>
<td></td>
</tr>
<tr>
<td><strong>14</strong></td>
<td>A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly detailed mitigative measures required, should be worked out with cost implications and submitted.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>There will be no significant impact on the surrounding wild life due to the project.</td>
<td></td>
</tr>
<tr>
<td><strong>15</strong></td>
<td>Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Tiger/Elephant Reserves/Critically Polluted Areas/Aravalli (existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the State Wildlife Department/Chief Wildlife Warden under the Wildlife (Protection) Act, 1972 and copy furnished.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>There is no National Park, Sanctuary, Wildlife Corridor, Tiger/Elephant Reserve (existing as well as proposed) within10 km radius of the mine lease.</td>
<td></td>
</tr>
</tbody>
</table>
A detailed biological study of the study area (core zone and buffer zone) shall be carried out. Details of flora and fauna, duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any Scheduled-I fauna found in the study area, the necessary plan for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.

Proximity to Areas declared as ‘Critically Polluted’ or the Project areas likely to come under the ‘Aravali Range’, (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Dept. Should be secured and furnished to the effect that the proposed mining activities could be considered.

Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).
19. R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programme prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village located in the mine lease area will be shifted or not. The issues relating to shifting of Village including their R&R and socio-economic aspects should be discussed in the report.

20. One season (non-monsoon) primary baseline data on ambient air quality (PM$_{10}$, SO$_2$ and NO$_x$), water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM$_{10}$, particularly for free silica, should be given.

There is no habitation in the mine lease area; hence there is no need of R&R Plan.

One season primary baseline data on ambient air quality, water quality, noise quality, Soil quality & flora & Fauna (Post-Monsoon’2013 – October- November- December’2013) has been collected and mentioned in EIA/EMP report in Chapter-4.

The summary of the data is given in Chapter–4. Monitoring locations are given as follows:-

Date wise baseline data collected is given in Annexure-8

The mineralogical composition of PM$_{10}$ particularly of free silica is given in Chapter: 4, point no. 4.9.

<table>
<thead>
<tr>
<th>Location</th>
<th>Distance (km)</th>
<th>Direction w.r.t plant site</th>
<th>Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kuncholi</td>
<td>0.4</td>
<td>Lease Area</td>
<td>Core</td>
</tr>
<tr>
<td>Dewana</td>
<td>0.3</td>
<td>Lease Area</td>
<td>Core</td>
</tr>
<tr>
<td>Kankroli</td>
<td>6</td>
<td>NE</td>
<td>Buffer</td>
</tr>
<tr>
<td>Mochinda</td>
<td>6.1</td>
<td>West</td>
<td>Buffer</td>
</tr>
<tr>
<td>Kolora</td>
<td>7</td>
<td>SW</td>
<td>Buffer</td>
</tr>
<tr>
<td>Sanyan ki Khera</td>
<td>8</td>
<td>North</td>
<td>Buffer</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing predominant wind direction may also be indicated on the map.</td>
<td>Air quality modeling has been carried out for prediction of impact due to proposed project activities on the present air quality of the area as shown in Chapter: 5. The Wind Rose diagram indicating predominant wind direction is shown in Figure 4.10 of EIA report. The required details are given in Chapter-4.</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.</td>
<td>The water requirement for the project is 5.0 KLD which includes both for dust suppression and for Domestic purpose. The details of water requirement are given in Chapter: 2.</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.</td>
<td>Required water demand will be met from Tanker Water Supply. Hence, CGWA Permission is not required.</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.</td>
<td>No water conservation measures have been proposed. No rain water harvesting is possible in ML area.</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Impact of the project on the water quality, both surface and groundwater should be assessed and necessary safeguard measures, if any required, should be provided.</td>
<td>There will be no significant impact on both surface &amp; ground water quality is expected.</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect ground water table, a detailed Hydro Geological Study should be undertaken and Report furnished. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.</td>
<td>At any slope river sand mining will not intersect groundwater table, as mining will be carried out to shallow depth (3m).</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Details of any stream, seasonal or otherwise, passing through the lease area and modification/diversion proposed, if any, and the impact of the same on the hydrology should be brought out.</td>
<td>Mining will be carried itself in river bed, So no diversion/modification is proposed.</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Information on site elevation, working depth, groundwater table etc should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.</td>
<td>Site elevation 635 to 512 AMSL  Ultimate Working Depth 3.0 meter  Ground water table (Pre-Monsoon) 3.16- 20.99 m bgl  Ground water table (Post-Monsoon) 1.08- 13.31 m bgl</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the project.</td>
<td>Greenbelt Development Plan is given in Chapter: 9.</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered.</td>
<td>The total extraction of sand will be 1000 TPD. The loading capacity of a truck is 20 ton hence 50 trucks will be used per day. So there will be no impact on local transport infrastructure due to the project. The working hours will be 8 hrs./Day, every hour approx 6 truck will be move, So there will be no impact on local transport infrastructure due to the project.</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA report.</td>
<td>All basic facilities to mine workers will be provided at site like shelter, washroom, first-aid, drinking water at mentioned in Chapter No: 7.</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.</td>
<td>There will be no generation of OB/waste material. No backfilling has been proposed in the excavated zone of river to some extent will be replenished by sediment during rainy season.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Greenbelt Development Plan is given in Chapter-9.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No such occupational health hazard is anticipated still worker will be provided face mask and ear plugs. Detail given in FEIA/EMP Report of Chapter: 5.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Proposed remedial measures and detail along with budgetary allocation for public health is given in Chapter: 9.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>There is no habitation in proposed project site hence no local community will be influenced. River sand mining will increases infrastructure work and facilities that will help in generating employment, transportation. Directly around 23 workers will be adopted in mining.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>Detailed environmental management plan to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Detailed Environmental Management Plan is given in Chapter: 9.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Public hearing points raised and commitment of the project proponent on the same along with time bound action plan to implement the same should be provided and also incorporated in the REIA/EMP Report of the Project.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Public hearing points and commitment has been incorporated in Chapter No: 7 in REIA/EMP Report.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>Details of litigation pending against the project, if any, with direction/order passed by any Court of Law against the project should be given.</td>
<td>No litigation pending against the project in any Court of Law to the best of our knowledge.</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>The cost of the project (capital cost and recurring cost) as well as the cost towards implementation of EMP should clearly be spelt out.</td>
<td>Capital cost for the Proposed project: Rs.68 Lac and Cost for EMP: Rs. 13.0 Lac. The same has been incorporated in Chapter: 9 of REIA/EMP Report.</td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>Details of replenishment studies.</td>
<td>Details of replenishment of River sand area given in Chapter: 5.</td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>Details of Transportation of mined out materials as per the Indian Road Congress for both the ways (loaded as well as unloaded trucks) load and its impact on Environment;</td>
<td>Details of Transportation of mined out materials as per the Indian Road Congress for both the ways (loaded as well as unloaded trucks) load and its impact on Environment are given in Chapter: 5.</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>Impact of mining on plankton</td>
<td>Given in Chapter: 4 of REIA/EMP report.</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>Details of mining activity to be provided w.r.t Block Wise/Calendar wise/Zonal wise, as the mine lease area having a long stretch.</td>
<td>Given in Chapter: 2 of REIA/EMP report.</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>Details of Gradient of river bed to be provided.</td>
<td>Given in Chapter: 4 of REIA/EMP report.</td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>Details of excavation schedule &amp; sequential mining plan.</td>
<td>Given in Chapter: 2 of REIA/EMP report.</td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>The Mining Plan shall be prepared carefully, dividing lease area into manageable blocks to ensure scientific and systematic mining of minor minerals.</td>
<td>Total Mining Area has been divided in 5 Blocks (A, B, C, D &amp; E) Details is Given in Chapter: 2 of REIA/EMP Report.</td>
<td></td>
</tr>
<tr>
<td>49</td>
<td>The base line data shall be collected so as to represent the whole mine lease area.</td>
<td>The monitoring stations were selected in continuity to represent the whole study area.</td>
<td></td>
</tr>
</tbody>
</table>

### 1.7 POST ENVIRONMENTAL CLEARANCE MONITORING

Environmental Monitoring Program shall be implemented for the proposed mining operations in post environmental clearance phase also.

Environmental monitoring program include:

(i) Environmental surveillance
(ii) Analysis & interpretation of data
(iii)Preparation of reports to support environmental management system and
(iv)Compliance of EC time to time.

A comprehensive environmental surveillance shall be carried out by the project proponent. Monitoring report will be directly sent to the regulatory authorities. The monitoring data generated on routine basis shall serve as tools for:

- Environmental status of the area
- Performance of the environmental protection measures
Overall effectiveness of EMP. The monitoring program also includes the action plan in case of emergency, so that appropriate measure may be taken.

1.8 GENERIC STRUCTURE OF ENVIRONMENTAL IMPACT ASSESSMENT DOCUMENT

As per the REIA guidance manual prepared by Administrative Staff College of India (ASCI), Hyderabad, The mining sector manual consists of eleven chapters, which correspond to the generic structure given as per REIA notification 2006, as amended December 2009. Based on this manual, the generic structure of the report is as follows:

- Introduction
- Project Description
- Analysis of Alternatives (Technology & Site)
- Description of the Environment
- Anticipated Environmental Impact & mitigation Measures
- Environmental Monitoring Program
- Additional studies
- Project benefits
- Environmental Management Plan
- Summary & Conclusion
- Disclosure of Consultant Engaged

*****
CHAPTER 2
PROJECT DESCRIPTION

2.1 GENERAL INTRODUCTION

Sand is naturally occurring granular material composed of finely divide rock and mineral particles. The composition of sand is highly variable, depending upon the composition of rock and its sources. The most common constituent of sand in inland continental settings and non-tropical coastal settings is silica (silicon dioxide, or SiO_2), usually in the form of quartz.

The second most common type of sand is calcium carbonate, for example aragonite, which has mostly been created, over the past half billion years, by various forms of life, like coral and shellfish. It is, for example, the primary form of sand apparent in areas where reefs have dominated the ecosystem for millions of years like the Caribbean.

Figure 2.1 Scene of River Sand

The most common constituent of sand, in inland continental settings and non-tropical coastal settings, is silica (silicon dioxide, or SiO_2), usually in the form of quartz, which, because of its chemical inertness and considerable hardness, is the most common mineral resistant to weathering.

Quarrying of river sand, it is true, is an important economic activity in the country with Bajri (River Sand) forming a crucial raw material for the infrastructural development and for the construction industry but excessive in-stream sand and gravel mining causes the degradation of rivers. In-stream mining lowers the stream bottom of rivers which may lead to bank erosion. Depletion of sand in the streambed and along coastal areas causes the deepening of rivers which may result in destruction of aquatic and riparian habitats as well. Extraction of alluvial material as already mentioned from within or near a streambed has a direct impact on the stream’s physical habitat characteristics.

DMG, Rajasthan awarded the river sand mine lease area 773.2797 Ha, lies in Tehsil: Nathdwara and District: Rajsamand covering 26 villages. In the Tehsil rivers are as follows: Banas and Lapli. As per approved mining plan 2.81 LTPA river sand will be excavated.
2.2 GEOLOGY OF THE AREA
The district named is derived from Rajsamand Lake, an artificial lake created in the 17th century by Rana Raj Singh of Mewar. The district had been constituted on 10 April 1991 from Udaipur district. Rajsamand district is located in the southern part of Rajasthan State and extends between north latitudes 24°43’32” and 26°1’36” and east longitudes 73°28’30” and 74°28’55”. The district comprises of 7 Tehsils namely, Bhim, Amet, Deogarh, Kumbhalgarh, Rajsamand, Railmagra, Nathdwara. It covers an area of 4768.10 Sq. kms. It is bounded in the south and south west by Udaipur district, in the east and south east by Bhilwara and Chittorgarh district, in the north by Ajmer district and in the west by Pali district. Rajsamand district with the area of 4768 sq km covers 1.39 percent of total area of state and is divided into 7 Tehsils and 7 blocks. The district head quarter Rajsamand is 80 kilometers from Udaipur and is well connected by road and meter gauge line of western Railway.

The oldest formation exposed in the area belongs to Bhilwara super group of Archean age. The northern, central and western part of the district are occupied by the younger formations of Aravalli super group and Delhi super group of Proterozoic age. Quaternary and recent alluvium overlies most of the formations in isolated pockets, along river courses and in shallow depressions.

2.2.1 REGIONAL GEOLOGY
The district comprises rocks of Bhilwara Super group, Aravali Super group, Railo Series and Delhi Super Group The geological succession of rocks is as given below:

Intrusive

**Delhi Super group**
- Kumbhalgarh Group: Calc-gneisses, calc-Schist, marble, Schist, migmatites, gneisses, quartzites etc.
- Gogunda Group: Quartzites, interbedded schist with subordinate impure calcareous metasediments.

Intrusive Synorogenic granite & gneisses, Rikhabdev ultramafic suite.

**Jharol Group**
- 54 Phyllite, chlorite -schist, arnet-mica schist, calc- schist with marble etc.

**Nathdwara Group**
- Phyllite, calcareous phyllite, intercalatry bands of dolomite / calcitic marble.

**Aravalli**
- Bari Lake Group: Meta volcanics, conglomerate, arkose, quartzite, phyllite, schist, dolomite etc.

**Super group**
- Udaipur Group: Phyllite, graywacke, mica-schist, quartzite, limestone and dolomite
- Debari Group: Conglomerates, arkose, quartzite, phyllite, dolomite, limestone, chert & carbonaceous phyllites. Undifferentiated granites, basic sills/ dykes.

**Pre- Aravallis**
- Intrusives: Unthala - Gingla granites.
- Mangalwar Complex: Lasaria & Sarada Migmatites, Composite gneisses, mica schist, etc.
2.2.2 LOCAL GEOLOGY
The NW and SW part of the district near Nathdwara, Khamnor, Tantol and Khedi are occupied by gneisses and schist of Mangalwar complex of banded gneiss complex. In the NW of Nathdwara these rocks are over lain by NE-SW trending rocks of Pur Banera group which are more or less calcareous facies rocks. Further eastwards rocks of Delhi Super Group are found. These trend NE-SW in north and swing to NW-SE in the southern part of the district. These Meta sediments are intruded by the Gneiss Schist which is found all along with Delhi Super Group of rocks. The rocks belonging to Ajabgarh group represented by quartzite Amphibolite are observed near Kumbhalgarh. In the eastern part of this river some outcrop of quartzite and amphibolites can be seen at the basement of Gomati River. Western part of lease area showing presence of some pegmetites, quartz feldspar and marble in vicinity area of the Banas River.

2.2.3 RIVER SAND
Sediments of less than 1 mm size are predominantly deposited in the riverbed by flood waters during rainy season. There is no perfect classification between Bajri (River Sand) and Silt. They have been deposited in a mixed state. As usual the large sixe sediments deposited at the bottom and the smaller sizes are deposited at the top, on the eages/flanks of the river bed. However during the course of shifting of the course towards east about five hundred years back, silt was deposited on top in thicker layers upto 3 meter in some cases underline by about 6-15 mt of River Sand.

2.2.4 PHYSICAL AND CHEMICAL CHARACTERISTICS OF MINERAL
The size of sediments varies from 1 mm to about 3 mm and is not uniform. The grains in the all size, small or large are rounded to sub rounded in shape. The colour of Bajri (River Sand) is grayish fine to course grained. Bajri (River Sand) weathered particles of feldspethic rocks of granitic composition with mixture of silica and other accessories minerals.

2.2.5 ORIGIN AND CONTROL OF MINERALIZATION
The sediments are river borne and have been formed as a result of weathering process of feldspethic rock of granitic composition. Running river is main agent responsible for weathering it is significant at the time of rainy season and generates a huge quantity of Bajri (River Sand) which deposited at the bottom of the river. The entire riverbed has ample quantity of Bajri (River Sand) of uniform grade. The size of sediments decrease towards the end of flow of river i.e. towards the river banks.

2.3 LOCATION DETAIL
The proposed project is located at Tehsil: Nathdwara, District: Rajsamand. The lease area lies on the river of 26 Revenue Villages situated in Tehsil: Nathdwara, District Rajsamand. The area of mining lease fall in Survey of India Topo sheet no. 45H/9, 45H/13, 45G/12, 45G/16. The lease area comprises of Govt. land. The geographical location of the project is-

**Latitude** 24°54′48.6″ N to 25°01′12.9″N

**Longitude** 73°37′18.9″E to 73°56′09.7″E
Figure 2.2 Location Map
Table 2.1 Villages Covering Lease Area

<table>
<thead>
<tr>
<th>Name of village</th>
<th>Khasra no</th>
<th>Area in Bigha=Biswa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Namana</td>
<td>1,656,657,658</td>
<td>268=07</td>
</tr>
<tr>
<td>Khedana</td>
<td>1018,428</td>
<td>345=02</td>
</tr>
<tr>
<td>Kumariya Kheda</td>
<td>1</td>
<td>45=16</td>
</tr>
<tr>
<td>Ulpura</td>
<td>47,449</td>
<td>53=18</td>
</tr>
<tr>
<td>Kothariya</td>
<td>1,128,833</td>
<td>235=05</td>
</tr>
<tr>
<td>Karjiya Ghati</td>
<td>1</td>
<td>43=05</td>
</tr>
<tr>
<td>Gunjol</td>
<td>405,412,1372</td>
<td>111=12</td>
</tr>
<tr>
<td>Kuncholi</td>
<td>442,1363,1357, 1579/1574,1586/1514</td>
<td>114=16</td>
</tr>
<tr>
<td>Kunthwa</td>
<td>429,431,2118</td>
<td>126=15</td>
</tr>
<tr>
<td>Bagol</td>
<td>1281</td>
<td>128=02</td>
</tr>
<tr>
<td>Gudla (Dhanyla)</td>
<td>3012,3452</td>
<td>67=03</td>
</tr>
<tr>
<td>Dhanyla</td>
<td>2176/365</td>
<td>31=03</td>
</tr>
<tr>
<td>Paneriyo ki Madri</td>
<td>73,487</td>
<td>127=18</td>
</tr>
<tr>
<td>Joshiyo ki Madri</td>
<td>1</td>
<td>118=14</td>
</tr>
<tr>
<td>Tantol</td>
<td>1,171</td>
<td>102=16</td>
</tr>
<tr>
<td>Sarsuniya</td>
<td>1,231,265,609</td>
<td>91=15</td>
</tr>
<tr>
<td>Khamnor</td>
<td>1,304,879,915,2058, 2276</td>
<td>200=14</td>
</tr>
<tr>
<td>Molela</td>
<td>5336,6113</td>
<td>155=14</td>
</tr>
<tr>
<td>Khedi</td>
<td>2111</td>
<td>56=08</td>
</tr>
<tr>
<td>Dabun</td>
<td>1,962,957,1845</td>
<td>129=05</td>
</tr>
<tr>
<td>Saloda</td>
<td>19,1016,1719</td>
<td>127=07</td>
</tr>
<tr>
<td>Karai</td>
<td>1749,2266,2678</td>
<td>45=13</td>
</tr>
<tr>
<td>Sema</td>
<td>2699,3002,3003,3004,3005</td>
<td>185=02</td>
</tr>
<tr>
<td>Chota Bhanuja</td>
<td>2796,2848,2941</td>
<td>68=10</td>
</tr>
<tr>
<td>Bada Bhanuja</td>
<td>43,115,157,162,317, 345,360,5019,5020</td>
<td>48=14</td>
</tr>
<tr>
<td><strong>Total in Bigha</strong></td>
<td></td>
<td><strong>3057=13</strong></td>
</tr>
<tr>
<td><strong>Total In Ha</strong></td>
<td></td>
<td><strong>773.2797</strong></td>
</tr>
</tbody>
</table>

2.3.1 INFRASTRUCTURE

2.3.1.1 NEAREST HIGHWAY
The nearest highway is N.H. - 8.

2.3.1.2 NEAREST RAILWAY STATION
The nearest railway station is Nathdwara about 20 km away from lease area.

2.3.1.2 NEAREST AIRPORT
The nearest airport is Udaipur (Dabok) airport about 40 km away from the Lease area.

2.4 IMPORTANCE TO THE COUNTRY AND REGION
India is a developing country which required large infrastructure development. Sand, Stone and Bajri mine are important source of raw materials for Infrastructure. Hence, considering the demand of Sand and Bajri & sufficient availability in the area, it is very much necessary to have Sand and Bajri projects to sustain Infrastructure project as well as household requirement in the area and to provide employment opportunities to the locals.

2.5 EXPLORATION
The rivers borne sediment are deposited all along the river bed and are very well exposed on the surface. Moreover these sediments accumulated/replenished every year during rainy season by flood waters to almost the same level depending on the intensity of rains on the upstream side. Adequate quantity of River Sand reserve is available for meeting consumer demand.

2.5.1 SYNTHESIS OF EXPLORATION

At present mining of River Sand is doing by local people with permission of government in some areas. On the basis of local geology and information gathered from the mining lease area and nearby area.

2.5.2 ESTIMATION OF RESERVE

River sediments (River Sand) have been deposited/mineralized in the form of stratified deposit. Mineralization is found in the entire river bed. The River Sand is brought by flood waters from upstream side and naturally deposited when the water current in the river slows down. Parameters for reserve estimation:

Following parameters are considered for reserve estimation:

a) Shape, size, width and depth extension of mineral as conceived on the geological plan and section.

b) Bulk density of the Bajri (River Sand) is taken as 1.40 (as per MMCR 1986).

c) Based on geological cross section the actual width and thickness is taken in to consideration.

d) Reserves only in proved category are calculated to a depth of 3.0 Mt. in river bed since mining has been restricted to 3.0m deep only for safety reasons.

Volumetric method is adopted for calculating reserves of River Sand. Reserves are estimation on the basis of established width, thickness, and stoke length based on influence of the mineralized formation in the river bed and where good inferences are available only such area are considered for reserve estimation. The depth is considered upto 3.0m as although working is permitted upto 3.0m depth in the riverbed.

Therefore reserves are:

Cross sectional area $3^2$ (average length x average width) x depth x Bulk density. The reserves in the riverbed shall be replenished by flood waters every year during rainy season.

Mineable reserves have been taken as 95% of geological reserves.

Proved reserves as per UNFC code (111)

Total reserves = 32477340 Tonnes

A) Blocked reserves as per UNFC code (211 & 122)

| WATER BODIES | = 4.00 HECT. |
| ROADS (18NOS) | = 37.2510 HECT |
| RAILWAY LINE | = 8.80 HECT |
| BRIDGE | = 3.510 HECT |

Total blocked Area = 53.56 Hect

Total blocked reserve =2249520 Tonnes

B) Minable Reserves = A-B

= 32477340 - 2249520 = 302.27 Lac Tonnes

2.6 PHYSICAL AND CHEMICAL SPECIFICATION

The Bajri (River Sand) is of two grades i.e. fine and coarse Bajri (River Sand) and used for different purpose as tabulated below:

<p>| Table 2.2 Grade &amp; uses of Sand |</p>
<table>
<thead>
<tr>
<th>Type of River Sand</th>
<th>Grade</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low grade River Sand</td>
<td>SiO₂ up to 85%</td>
<td>Building materials of low cost use</td>
</tr>
<tr>
<td></td>
<td>Fe₂O₃ up to 2.75 %</td>
<td></td>
</tr>
<tr>
<td>High Grade River Sand</td>
<td>SiO₂ up to 98%</td>
<td>Building of medium and high class use</td>
</tr>
<tr>
<td></td>
<td>Fe₂O₃ up to 0.5%</td>
<td></td>
</tr>
</tbody>
</table>

Figure 2.3 FCC Map of River Sand Mining Area
Fig: 2.4 Surface Geological Plan of ML Area
2.7 USE OF MINERAL
Bajri (River Sand) will be useful for construction in different size fraction varying from fine Bajri (River Sand) to coarse Bajri (River Sand) of 6mm size.
The Bajri (River Sand) is generally used as fine and coarse Bajri (River Sand) for various construction purposes

2.8 METHOD OF MINING
The Bajri (River Sand) is won from river bed adopting open cast semi-mechanized mining method. Mining will be done by removal of Bajri (River Sand) from river bed with the help of Excavator/poclain (09 m$^3$ capacity) back hoe excavators, loaded in to trucks and send it nearby market. This leaves a top bench of 1-3 mtr depth and at least 20 mt widths. The Bajri (River Sand) below this (2m/3m bench) is then excavated by backhoe type excavators directly loading into large trucks for dispatch to consumers. Water is sprinkled in the area from where the Bajri (River Sand) is to be removed before the operation start and thereafter at regular intervals to keep the dust allayed at the source its Removal of Bajri (River Sand) precedes the wining of River Sand. Once a pre- determined area has been exhausted of the Bajri (River Sand) there is no need for drilling & blasting as hard rock is not encountered in Bajri (River Sand) mining.
It has been noticed while caring out mining that Bajri (River Sand) mining proves beyond doubt that semi-mechanized mining method are most economical safe involve the least manpower thereby giving high OMS (more then 150). In spite of handling of large quantities of Bajri (River Sand) the mine has clean atmosphere and not even a speck of dust can be seen pollution the air. Environment and ecology of the area remains undisturbed.
Mining work will be carried out by mechanized method by forming only one bench maximum 3.0m in Depth. The existing pits if any shall be widened and deepened to from proper benches. Loader of mineral shall be by excavators while transport of mineral mined out by the river bed.

2.9 DETAIL OF MINING ACTIVITY TO BE PROVIDED W.R.T BLOCK WISE/ CALENDAR WISE/ ZONAL WISE, AS THE MINE LEASE AREA HAVING A LONG STRETCH
Lease has been allotted for a period of 5 years. Lease area consists of 773.2797 hectare in khasra of 26 villages in a stretch of 50.0 km. it is proposed to work 05 Block as per the detail given as below:
Production programmed = 50 trucks/day  
Capacity of Truck is 20 tons/day  
Total production = 50 x 20 = 1000 tons/day

<table>
<thead>
<tr>
<th>Year</th>
<th>Area in M²</th>
<th>Thickness</th>
<th>Volume (Cum)</th>
<th>Sp./Gravity</th>
<th>Mineral in ton</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>13400</td>
<td>3 Mtr.</td>
<td>40200</td>
<td>1.4</td>
<td>56280</td>
</tr>
<tr>
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</tr>
</tbody>
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<td>3 Mtr.</td>
<td>40200</td>
<td>1.4</td>
<td>56280</td>
</tr>
</tbody>
</table>

2.10 GENERAL FEATURES  
2.10.1 MINE DRAINAGE
The ground water in this area gets intersected at a depth of more than 20m bgl in riverbed more than 15m near the river. No work shall be carried out below the water level.

2.10.2 VEHICULAR TRAFFIC DENSITY
The total extraction of sand will be 1000 TPD. The loading capacity of a truck is 20 ton hence 50 trucks will be used per day. So there will be no impact on local transport infrastructure due to the project. The Highway has traffic density less than 3 trucks per hour. On these Highway trucks/trolleys ply regularly and these will easily accommodate additional dumper/tippers per hour.

Traffic Load:
Total production per year: 2.81 Lac
Total production = 25 x 40 = 1000 tons/day
Total working day: 280
Production programmed is 50 trucks/day
Capacity of truck is 20 tons

2.10.3 POWER REQUIREMENT
There will be no requirement of power as the mining work will be done only day time.

2.10.2 WATER REQUIREMENT
The total water demand for the proposed project will be 5 KLD. Required water will be met from Tanker Water Supply.

Table 2.3 Water Requirement

<table>
<thead>
<tr>
<th>S. No</th>
<th>Activities</th>
<th>Average Demand (M³/Day)</th>
<th>Peak demand (M³/Day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Mine</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. Drilling and spraying</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>b. Dust suppression &amp; Green belt</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>c. Equipment / Vehicle washing</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>d. Pit head bath</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>e. Drinking water at mine site</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2.</td>
<td>Township Drinking</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>3.</td>
<td>Crushing/ Screening Dust suppression</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
<tr>
<td></td>
<td>a. Road</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. Ore Stack</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Ore beneficiation (if any)</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>
2.10.5 MINING MACHINERY
All the mining machinery will be used belongs to contractor on hire basis. The mining will be done with the help of. Excavators, front end loaders, dumpers, etc. Following equipment is proposed to be deployed for the desired production.

Table 2.4 List of machinery

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name of machinery</th>
<th>Capacity</th>
<th>Nos.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Excavators</td>
<td>0.9 to 1.2 m³</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Tippers/Trucks</td>
<td>20 tonnes</td>
<td>50</td>
</tr>
<tr>
<td>3</td>
<td>Water Tanker</td>
<td>4000 Ltrs.</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>Pay loader JCB</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>Light vehicles</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

2.10.6 WORKSHOP
Mining will be semi mechanized so there is essential requirement of a work shop where loading and haulage machineries and equipment will be repair and maintained for regular and smooth working.

2.10.7 FIRST – AID FACILITY
A first aid box with all necessary medicines will be kept all the times in the office building and nearby significant working areas for use as and when required.

2.11 MANPOWER REQUIREMENTS
Manpower will be about 23 persons as per the detail given below:

Table 2.5 Employment Detail

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Category</th>
<th>Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Manager- 1st or 2nd Class</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Safety Officer/ Assistant</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Mine foreman</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Mine Mate</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>Semi Skilled personnel</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>Un skilled personnel</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>23</strong></td>
</tr>
</tbody>
</table>

2.12 PROJECT IMPLEMENTATION SCHEDULE / STAGES
Efforts are being made to obtain all the statutory permissions of the mine. Mine lease has been granted with effective from agreement after obtaining environmental clearance for a period of 5 years. The commencement of production with proposed capacity of 2.81 LTPA will start soon after obtaining Environmental Clearance from MoEF followed by CTE & CTO.
CHAPTER- 3
ANALYSIS OF ALTERNATIVES (TECHNOLOGIES & SITES)

3.1 ANALYSIS OF ALTERNATIVE SITE
The proposed project is site specific project. Hence, no need to alternative site study performed.

3.2 ANALYSIS OF ALTERNATIVE TECHNOLOGIES
Different methods of mining have been developed since mining had been started. With the development of the new technologies many advanced method have been adopted, yielding more extraction and least impacts on various environmental aspects such as land, air, water, noise, biodiversity. A well-known mitigating measure applied at various locations around the world is selecting sand mining method which will cause the least environmental damage. Conventionally the River Sand mining is carried out manually but in the present time semi- mechanized mining and pollution free mining method should be adopted. Mining methods should be adopted to facilitate the replenishment of the excavated pits during rainy season. Different methods of mining are as below:-

3.2.1 OPEN CAST MINING METHOD
River Sand Mining proves beyond doubt that semi-mechanized mining method are most economical, environmentally friendly and safe also involve the minimum manpower thereby giving high OMS (more than 150). In spite of handling of large volume of River Sand the mine has no or negligible adverse impact on environment hence environment and ecology of the area remains undisturbed. Mining of the river sand does not require blasting or drilling as the mineral is loose in nature. It is also known as surface mining method.

3.2.2 UNDERGROUND MINING METHOD
Being a loose material, no underground mining is possible.

3.3 SELECTION OF MINING METHODOLOGY
After the complete analysis of the technologies and the nature of the material to be extracted, mining will be done by semi mechanized open cast method, using light weight excavator sand directly loading of minerals in trucks and tractors. This is one of the most eco-friendly methods to minimize the impact of the mining on surrounding environment.

*****
CHAPTER 4

DESCRIPTION OF THE ENVIRONMENT

4.1 INTRODUCTION

A regional background to the baseline data is being presented at the very onset, which will help in better appreciation of micro-level field data, generated on several environmental and ecological attributes of the study area. The base line status of the project environment is described section wise for better understanding of the broad-spectrum conditions. The baseline environment quality represents the background environmental scenario of various environmental components such as air, noise, land, ecological and socio-economic status of the study area. Field monitoring studies to evaluate the base line status of the project site were carried out covering October, November and December-2013 in compliance with CPCB guidelines. The key plan for detailed Environmental Baseline study is finalized based on standard guidelines of MoEF and CPCB. The local topography and meteorological conditions of the study area are taken into consideration while preparing the key plan.

4.2 STUDY AREA

The study area is taken in accordance with the provisions of sector specific EIA guidance manual for Mining of Minerals manual published by Ministry of Environment and Forests, during 2010. The study area for the proposed sand mining is as follows:

- The proposed project area (Mine lease area) is considered as ‘Core Zone’
- 10 km. radius from the boundary limits of the mine lease area is considered as ‘Buffer Zone’

### Table 4.1 Study Area at a Glance

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Particulars</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>General</td>
<td></td>
</tr>
<tr>
<td>a</td>
<td>Village</td>
<td>Village details enclosed as Annexure No. 3</td>
</tr>
<tr>
<td>b</td>
<td>Tehsil</td>
<td>Nathdwara</td>
</tr>
<tr>
<td>c</td>
<td>District</td>
<td>Rajsamand</td>
</tr>
<tr>
<td>d</td>
<td>State</td>
<td>Rajasthan</td>
</tr>
<tr>
<td>f</td>
<td>Latitude</td>
<td>24°54'48.6&quot; to 25°01'12.9&quot;</td>
</tr>
<tr>
<td>g</td>
<td>Longitude</td>
<td>73°37'18.9&quot; to 73°56'09.7</td>
</tr>
<tr>
<td>h</td>
<td>Toposheet No.</td>
<td>45H/9, 45 H/13, 45G/12, 45 G/16</td>
</tr>
<tr>
<td></td>
<td>Demography (Study Area)</td>
<td></td>
</tr>
<tr>
<td>a</td>
<td>Total population</td>
<td>195363</td>
</tr>
<tr>
<td>b</td>
<td>Scheduled Castes</td>
<td>21352</td>
</tr>
<tr>
<td>c</td>
<td>Literacy Rate</td>
<td>52.66%</td>
</tr>
<tr>
<td>d</td>
<td>Working Population</td>
<td>100349</td>
</tr>
<tr>
<td></td>
<td>Climatology (During Study Period)</td>
<td></td>
</tr>
<tr>
<td>a</td>
<td>Temperature Max. (°C)</td>
<td>34.6</td>
</tr>
<tr>
<td>b</td>
<td>Temperature Min. (°C)</td>
<td>7.6</td>
</tr>
<tr>
<td>c</td>
<td>Dominant Wind Direction</td>
<td>NE-SW</td>
</tr>
</tbody>
</table>
**4.3 INSTRUMENTS USED FOR ENVIRONMENTAL BASELINE DATA COLLECTION**

A. Respirable Dust Sampler with attachment for gaseous Pollutants  
B. Sound Level Meter  
C. Water Level Indicator  
D. GPS  

Apart from collecting samples of air, water and soil from representative sampling points given in proceeding sections, the data were collected by the field team through interaction with a large number of local inhabitants of the study area and different Government departments/agencies. This provided an excellent opportunity to the members of the field team for obtaining clear scenario of the existing environment of the study area.  

In order to assess impacts of project activities on assisting physical biological and social Environment it is necessary to collect information on following parameters:  
May be given according to priority and the importance of parameters specific to the project  
1. Land Environment  
2. Water Environment  
3. Meteorology  
4. Air Environment  
5. Noise Environment  
6. Biological Environment  
7. Socio-economic Environment  

To achieve these objectives, our team monitored the above said environmental parameters within core and buffer zone (10 km. radial distance) from the project site in accordance with the Guidelines for EIA issued by the Ministry of Environment & Forests, Govt. of India.
4.4 LAND ENVIRONMENT
4.4.1 TOPOGRAPHY
The proposed area is a river bed which is gentle slope. The elevation in the area varies from 635 mRL to 520 mRL. The surrounding area is devoid of any thick vegetation except for patched agricultural lands. The Rivers flow from West to East direction. The alluvial ground surface overlying river sand some distance away from the river bed is under cultivation. River is non Perennial River and it turns only in rainy season and almost dry in summer.

Table: 4.3 Slope Ratios

<table>
<thead>
<tr>
<th>Highest elevation:</th>
<th>635 mRL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowest elevation</td>
<td>520 mRL</td>
</tr>
<tr>
<td>Difference</td>
<td>635-520 = 115 mRL</td>
</tr>
<tr>
<td>River Length</td>
<td>50 km</td>
</tr>
<tr>
<td>Slope Ratio</td>
<td>2.3 m</td>
</tr>
</tbody>
</table>

Fig: 4.3 Slope Map of Study Area
4.4.2 PHYSIOGRAPHIC & DRAINAGE PATTERN

Rajsamand district consists of monotonously rolling topography interacted by shallow valleys. Towards the Western part of the district, Aravalli hills, a series of ridges run diagonally in the direction of NE and SW. The highest portion of Aravallis occurs south of Kailwar near Kumbhalgarh fort (25°08' 73°35') with an altitude of 1293 m above msl. A typical gneissic plain bearing irregularly carved of gneisses and granites without any alluvium cover is observed to the highest altitude of above 600 m amsl. The Central and Eastern part of the district is relatively plain area forming the foot hill part of Aravalli ranges. This plain gently slopes towards the East and North-East. In the higher and more rugged part towards the Western side alluvium is scanty where as in the Eastern flank the alluvium is more continuous and reasonably thick.
4.4.3 LAND USE/LAND COVER STUDY
Land use pattern of villages surrounding the mining lease is shown in table 4.2. & land use/land cover map of study area is shown as figure 4.4.

### Table 4.2 Land use /Land Cover Area Distribution

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Class</th>
<th>Area (Hectare)</th>
<th>Area (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Railway Line</td>
<td>12.90</td>
<td>0.01</td>
</tr>
<tr>
<td>2</td>
<td>Road</td>
<td>234.64</td>
<td>0.22</td>
</tr>
<tr>
<td>3</td>
<td>Settlements</td>
<td>2648.32</td>
<td>2.45</td>
</tr>
<tr>
<td>4</td>
<td>Water Body/River/Lease Area</td>
<td>3274.14</td>
<td>3.03</td>
</tr>
<tr>
<td>5</td>
<td>Forest Area</td>
<td>2929.72</td>
<td>2.71</td>
</tr>
<tr>
<td>6</td>
<td>Hilly/Rocky Area</td>
<td>5574.46</td>
<td>5.16</td>
</tr>
<tr>
<td>7</td>
<td>Crop Land</td>
<td>29353.57</td>
<td>27.19</td>
</tr>
<tr>
<td>8</td>
<td>Open Scrub Land</td>
<td>63930.06</td>
<td>59.22</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>107957.81</td>
<td>100</td>
</tr>
</tbody>
</table>

**Fig: 4.5 Land Use/Land Cover Map of the Study Area**
4.4.4 SOIL CHARACTERISTICS OF THE AREA

The soils of the district vary from sandy loam in Bhim, Deogarh & Amet blocks to heavy clay in Kumbhalgarh block. The types of soil occurring in the district are classified as follows: Type of Soil Name of block Sandy loam Bhim, Deogarh, Amet Clay loam Rajsamand, Relmagra, Khamnor Heavy clay Kumbhalgarh.

The loam soil can support almost all crops. Clay loam is suitable for cultivation of wheat, Barley, Maize, Cotton, Sugar cane, Jawar etc. crops like Bajra, Moong, Moth, Guar, Ground nut, til etc. can be grown on Sandy loam soils. Wheat, sugarcane and rice are the main crops of clay soils. Broadly, the Northern, Southern and Eastern part of the district possesses loam, foot hill soils and black cotton
soil with moderate run off, where as in the western part of the district lithosols and regosols of hills and rocky outcrops having very high run off are prevalent. Soil infiltration rate varied from 0.6 cm/hr to 4.2 cm/hr while the average infiltration rate was found 2.35 cm/hr. The cumulative depth to which vertical infiltration took place varied from 3.6 to 16.2 cm by which time, constant infiltration rate was also achieved.

Soil map of river sand mining study area is shown as figure 4.3.

**Fig: 4.3 Soil Map of the Study Area**
The information regarding soil environment has been collected from various secondary sources and also through soil quality analysis of soil samples collected from the study area. For studying soil quality of the region six samples were collected to assess the existing soil conditions in and around the project area. The soil sampling locations are presented in the below Table-4.3.

**Table 4.3 Description of Soil Sampling Locations**

<table>
<thead>
<tr>
<th>Location</th>
<th>Distance (km)</th>
<th>Direction w.r.t plant site</th>
<th>Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kuncholi</td>
<td>0.4</td>
<td>Lease Area</td>
<td>Core</td>
</tr>
<tr>
<td>Dewana</td>
<td>0.3</td>
<td>Lease area</td>
<td>Core</td>
</tr>
<tr>
<td>Kankroli</td>
<td>6</td>
<td>NE</td>
<td>Buffer</td>
</tr>
<tr>
<td>Mochinda</td>
<td>6.1</td>
<td>West</td>
<td>Buffer</td>
</tr>
<tr>
<td>Kolora</td>
<td>7</td>
<td>SW</td>
<td>Buffer</td>
</tr>
<tr>
<td>Sanyan ki Khera</td>
<td>8</td>
<td>North</td>
<td>Buffer</td>
</tr>
</tbody>
</table>

The present study on the soil quality establishes the baseline characteristics and identifies the incremental concentrations if any, due to the proposed project. The objective of the sampling is:

- To determine the baseline soil characteristics of the study area;
- To determine the impact of proposed activity on soil characteristics; and
- To determine the impact on soils more importantly from agricultural productivity point of view.

The soil sample was collected from three different depths viz. 30 cm, 60 cm and 90 cm. The samples were then packed in a polythene plastic bag and sealed. The sample from six different depths was homogenized and then was analyzed. The soil sampling locations are depicted in the below figure.
Figure 4.6 Topographical Map Showing Soil, Air, Water & Noise Sampling Locations

4.4.5 BASELINE SOIL STATUS

Soil quality of the study area is one of the important components of the environment. Soil samples from six villages located in the study area were collected as per methodology specified in BIS to make them representative and analyzed for physico-chemical analysis. The soil analysis results are presented in Table-4.4.

Table 4.4 Soil Analysis Results

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Parameters</th>
<th>Unit</th>
<th>Kuncholi</th>
<th>Dewana</th>
<th>Kankroli</th>
<th>Mochinda</th>
<th>Kolara</th>
<th>Sanya Ka Khera</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>pH(1:5 suspension)</td>
<td>-</td>
<td>7.68</td>
<td>7.72</td>
<td>8.08</td>
<td>7.91</td>
<td>7.67</td>
<td>7.88</td>
</tr>
<tr>
<td>2.</td>
<td>Electrical Conductivity at 25°C (1:5 suspension.)</td>
<td>μS/cm</td>
<td>364</td>
<td>359</td>
<td>389</td>
<td>372</td>
<td>358</td>
<td>368</td>
</tr>
</tbody>
</table>
### RESULTS
The soil analysis results are presented in above table. The result obtained is compared with the standard soil classification as given in Agriculture soil limits. Samples collected from identified locations indicate pH value ranging from 7.67 to 8.08, which shows that the soil is slightly alkaline in nature. Organic Matter ranges from 0.53% to 0.89% in the soil samples.

#### 4.5 SEISMICITY & FLOOD HAZARD ZONE OF AREA
Rajsamand District lies in low damage risk zone II. The area is less prone to earthquakes as it is located on comparatively stable geological plains based on evaluation of the available earthquake zone information. **Figure 4.7** depicts the earthquake zones of Rajasthan. **Figure 4.8** shows flood prone zones of the Rajsamand district.
4.6 WATER ENVIRONMENT

4.6.1 GROUND WATER

The general water table depth of the aquifers in the study area varies between 3.16–20.99 to 1.08–13.31 mbgl on pre-monsoon and post-monsoon basis. The water level fluctuations in these aquifers vary between 2.08 to 7.68 m. **Fig. 4.9** showing the depth of water level of Rajsamand District.

4.6.2 GROUND WATER QUALITY

Selected water quality parameters of ground water resources within 10-km radius of the study area have been studied for assessing the hydrological environment to evaluate anticipated impact of the proposed mine. Understanding the water quality is essential in the preparation of Environmental Impact statement. It also assists to identify critical issues in a view to suggest appropriate mitigation measures for implementation.

The purpose of this study is to:

1. Assess the water quality characteristics for critical parameters;
2. Evaluate the impacts on agricultural productivity, habitat conditions, recreational resources and aesthetics in the vicinity; and
3. Predict the likely impacts on water quality due to the project and related activities.
4.6.3 METHODOLOGY
Reconnaissance survey was undertaken and monitoring locations were finalized based on the following aspects:

- Drainage pattern of the regional area;
- Location of residential areas representing different activities/likely impact areas; and
- Areas representing the existing baseline environment.

6 groundwater samples were collected in the study area were examined for physico-chemical parameters. The samples were collected and analyzed as per the procedures specified in 'Standard Methods for the Examination of Water and wastewater' published by American Public Health Association (APHA).

4.6.4 WATER SAMPLING LOCATIONS
Ground water samples were collected as grab samples and were analyzed for various parameters. The analyzed results were compared with the standards for drinking water as per IS: 10500. The water sampling locations are shown in following Table.

<table>
<thead>
<tr>
<th>Location</th>
<th>Distance (km)</th>
<th>Direction w.r.t plant site</th>
<th>Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kuncholi</td>
<td>0.4</td>
<td>Lease Area</td>
<td>Core</td>
</tr>
<tr>
<td>Dewana</td>
<td>0.3</td>
<td>Lease area</td>
<td>Core</td>
</tr>
<tr>
<td>Kankroli</td>
<td>6</td>
<td>NE</td>
<td>Buffer</td>
</tr>
<tr>
<td>Mochinda</td>
<td>6.1</td>
<td>West</td>
<td>Buffer</td>
</tr>
<tr>
<td>Kolora</td>
<td>7</td>
<td>SW</td>
<td>Buffer</td>
</tr>
<tr>
<td>Location</td>
<td>Distance (km)</td>
<td>Direction w.r.t plant site</td>
<td>Zone</td>
</tr>
<tr>
<td>----------------</td>
<td>---------------</td>
<td>----------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>Kuncholi</td>
<td>0.4</td>
<td>Lease Area</td>
<td>Core</td>
</tr>
<tr>
<td>Dewana</td>
<td>0.3</td>
<td>Lease area</td>
<td>Core</td>
</tr>
<tr>
<td>Kankroli</td>
<td>6</td>
<td>NE</td>
<td>Buffer</td>
</tr>
<tr>
<td>Sanyan ki Khera</td>
<td>8</td>
<td>North</td>
<td>Buffer</td>
</tr>
</tbody>
</table>

### 4.6.5 PRESENTATION OF RESULTS

Groundwater & surface water samples have been considered in and around the proposed mine site within the periphery of 10 km taking in to account the various uses, these water resources are put to. The results of water samples are presented in Table-4.5.

**Table 4.5 Water Analysis Results**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Requirement (Desirable Limit) (As per BIS 10500:2012)</th>
<th>Permissible limit in the Absence of Alternate source (As per BIS 10500:2012)</th>
<th>Location and Source of Water Sample</th>
<th>GW1</th>
<th>(GW2)</th>
<th>(GW3)</th>
<th>(GW4)</th>
<th>(GW5)</th>
<th>(GW6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requirement (Desirable Limit) (As per BIS 10500:2012)</td>
<td>[%]</td>
<td>[mg/L]</td>
<td>Location and Source of Water Sample</td>
<td>GW1</td>
<td>(GW2)</td>
<td>(GW3)</td>
<td>(GW4)</td>
<td>(GW5)</td>
<td>(GW6)</td>
</tr>
<tr>
<td>Colour</td>
<td>5</td>
<td>&lt;1.0</td>
<td>Kuncholi</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Odour</td>
<td>Agreeable</td>
<td>Agreeable</td>
<td>Dewana</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taste</td>
<td>Agreeable</td>
<td>Agreeable</td>
<td>Kankroli</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turbidity</td>
<td>1</td>
<td>&lt;1.0</td>
<td>Mochinda</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pH value</td>
<td>6.5-8.5</td>
<td>&lt;7.5</td>
<td>Kolara</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total dissolve solid (TDS)</td>
<td>500</td>
<td>&lt;488.36</td>
<td>Sayan Ka Khera</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aluminum (as AI)</td>
<td>0.03</td>
<td>BDL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Ammonia</td>
<td>0.5</td>
<td>BDL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anionic surface Detergents(as MBAS)</td>
<td>0.2</td>
<td>BDL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barium (as Ba)</td>
<td>0.7</td>
<td>BDL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boron (as B)</td>
<td>0.5</td>
<td>BDL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calcium (as Ca)</td>
<td>75</td>
<td>BDL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chloramines (as Cl₂)</td>
<td>4.0</td>
<td>BDL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chloride (as Cl)</td>
<td>250</td>
<td>BDL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Copper (as Cu)</td>
<td>0.05</td>
<td>BDL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluoride (as F)</td>
<td>1.0</td>
<td>BDL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free Residual Chlorine</td>
<td>0.2</td>
<td>BDL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iron (as Fe)</td>
<td>0.3</td>
<td>BDL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnesium (as Mg)</td>
<td>30</td>
<td>BDL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manganese (as Mn)</td>
<td>0.1</td>
<td>BDL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 4.6.5 Observation and Results

The analysis results indicate that the pH ranges from 7.24 to 7.62 of the study area. The TDS (Total Dissolved Solids) was found in the range 486.82 mg/L to 495.07 mg/L. It is seen that the physico-chemical analysis of other parameters like Chloride, Calcium, Magnesium, Nitrate and Fluoride were found within desirable limit of IS (10500:2012).

#### 4.7 METEOROLOGY

The meteorological data helps for appropriate interpretation of the baseline status of the study area as well as for input into prediction models to evaluate air quality dispersion. Chronological data on meteorological parameters also plays an important role in identifying the general meteorological regime of the region. For the Study area, India Meteorological Department (IMD) broadly divides the year into four seasons given below:

**Table 4.6 Four Seasons Divided By IMD**

<table>
<thead>
<tr>
<th>Season</th>
<th>Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter</td>
<td>January to February</td>
</tr>
<tr>
<td>Pre-monsoon</td>
<td>March to May</td>
</tr>
<tr>
<td>Monsoon</td>
<td>June to September</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mn)</td>
<td>45</td>
</tr>
<tr>
<td>Nitrate (as NO₃)</td>
<td>6.21</td>
</tr>
<tr>
<td>Selenium (as Se)</td>
<td>0.01</td>
</tr>
<tr>
<td>Silver (as Ag)</td>
<td>0.1</td>
</tr>
<tr>
<td>Sulphate (as SO₄)</td>
<td>200</td>
</tr>
<tr>
<td>Sulphide (as H₂S)</td>
<td>0.05</td>
</tr>
<tr>
<td>Alkalinity (as Ca CO₃)</td>
<td>200</td>
</tr>
<tr>
<td>Total Hardness (as CaCO₃)</td>
<td>200</td>
</tr>
<tr>
<td>Zinc (as Zn)</td>
<td>5.0</td>
</tr>
<tr>
<td>Cadmium (as Cd)</td>
<td>0.003</td>
</tr>
<tr>
<td>Cyanide (as CN)</td>
<td>0.05</td>
</tr>
<tr>
<td>Lead (as Pb)</td>
<td>0.01</td>
</tr>
<tr>
<td>Mercury (as Hg)</td>
<td>0.001</td>
</tr>
<tr>
<td>Nickel (as Ni)</td>
<td>0.02</td>
</tr>
<tr>
<td>Arsenic (as As)</td>
<td>0.01</td>
</tr>
<tr>
<td>Total Chromium (as Cr)</td>
<td>0.05</td>
</tr>
<tr>
<td>Coliform Bacteria</td>
<td>Absent</td>
</tr>
<tr>
<td>E.Coli</td>
<td>Absent</td>
</tr>
</tbody>
</table>

---

4.6.5 Observation and Results

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<thead>
<tr>
<th>Season</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Winter</td>
<td>January to February</td>
</tr>
<tr>
<td>Pre-monsoon</td>
<td>March to May</td>
</tr>
<tr>
<td>Monsoon</td>
<td>June to September</td>
</tr>
</tbody>
</table>
4.7.1 METEOROLOGICAL DATA RECORDED AT PROPOSED PROJECT SITE
Meteorology plays a vital role in affecting the dispersion of pollutants. Since meteorological factors show wide fluctuations with time, meaningful interpretations can be drawn only from long-term reliable data. The source of such data is the Indian meteorological Department (IMD), which maintains a network of meteorological stations at several important locations.

4.7.2 METEOROLOGICAL DATA
The data recorded at site for the study period October-2013 to December-2013 are summarized in Table 4.7.

<table>
<thead>
<tr>
<th>Month</th>
<th>Temp (°C)</th>
<th>Relative Humidity (%)</th>
<th>Rainfall (in mm)</th>
<th>Average wind speed (m/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Max.</td>
<td>Min.</td>
<td>08:30 hrs.</td>
<td>17:30 hrs</td>
</tr>
<tr>
<td>October 2013</td>
<td>34.6</td>
<td>15.8</td>
<td>49-68 %</td>
<td>19-33%</td>
</tr>
<tr>
<td>November 2013</td>
<td>30.6</td>
<td>10.1</td>
<td>56-82%</td>
<td>24-37%</td>
</tr>
<tr>
<td>December 2013</td>
<td>29.9</td>
<td>7.6</td>
<td>30-85%</td>
<td>19-70%</td>
</tr>
</tbody>
</table>

*Source: Data Recorded during Study*

Percentage frequencies of wind in 16 directions have been computed from the recorded data during the study period [October, 2013 to December, 2013] for 24 hourly intervals to plot wind rose. Fig. 4.10 represents the wind pattern of the study period.

4.7.3 WIND PATTERN DURING THE STUDY PERIOD
The overall predominant wind direction during study period was observed towards North East. The wind rose diagram for the study period given below:
Figure 4.10 Wind Rose Diagram

Table 4.8 Wind Class Frequency Distribution

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Directions / Wind Classes (m/s)</th>
<th>0.5 - 2.1</th>
<th>2.1 - 3.6</th>
<th>3.6 - 5.7</th>
<th>5.7 - 8.8</th>
<th>8.8 - 11.1</th>
<th>&gt;= 11.1</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>348.75 - 11.25</td>
<td>2.63158</td>
<td>4.69417</td>
<td>1.4936</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5.61849</td>
</tr>
<tr>
<td>2</td>
<td>11.25 - 33.75</td>
<td>2.20484</td>
<td>2.20484</td>
<td>0.92461</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3.39828</td>
</tr>
<tr>
<td>3</td>
<td>33.75 - 56.25</td>
<td>1.4936</td>
<td>2.48933</td>
<td>0.21337</td>
<td>0.07112</td>
<td>0</td>
<td>0</td>
<td>2.71862</td>
</tr>
<tr>
<td>4</td>
<td>56.25 - 78.75</td>
<td>0.64011</td>
<td>2.77383</td>
<td>0.56899</td>
<td>0.14225</td>
<td>0</td>
<td>0</td>
<td>2.628</td>
</tr>
<tr>
<td>5</td>
<td>78.75 - 101.25</td>
<td>0.56899</td>
<td>2.56046</td>
<td>0.85349</td>
<td>0.14225</td>
<td>0</td>
<td>0</td>
<td>2.628</td>
</tr>
<tr>
<td>6</td>
<td>101.25 - 123.75</td>
<td>0.07112</td>
<td>0.92461</td>
<td>0.07112</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.67966</td>
</tr>
<tr>
<td>7</td>
<td>123.75 - 146.25</td>
<td>0.35562</td>
<td>0.2845</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.40779</td>
</tr>
<tr>
<td>8</td>
<td>146.25 - 168.75</td>
<td>0.14225</td>
<td>0.14225</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.18124</td>
</tr>
<tr>
<td>9</td>
<td>168.75 - 191.25</td>
<td>0.2845</td>
<td>0.21337</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.31717</td>
</tr>
<tr>
<td>10</td>
<td>191.25 - 213.75</td>
<td>0.21337</td>
<td>0.14225</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.22655</td>
</tr>
<tr>
<td>11</td>
<td>213.75 - 236.25</td>
<td>0.2845</td>
<td>0.42674</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.4531</td>
</tr>
<tr>
<td>12</td>
<td>236.25 - 258.75</td>
<td>0.21337</td>
<td>0.14225</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.22655</td>
</tr>
<tr>
<td>13</td>
<td>258.75 - 281.25</td>
<td>0.2845</td>
<td>0.49787</td>
<td>0.2845</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.67966</td>
</tr>
<tr>
<td>14</td>
<td>281.25 - 303.75</td>
<td>0.21337</td>
<td>0.2845</td>
<td>0.14225</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.40779</td>
</tr>
<tr>
<td>15</td>
<td>303.75 - 326.25</td>
<td>0.85349</td>
<td>0.2845</td>
<td>0.2845</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.90621</td>
</tr>
<tr>
<td>16</td>
<td>326.25 - 348.75</td>
<td>0.35562</td>
<td>0.2845</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.40779</td>
</tr>
<tr>
<td></td>
<td><strong>Sub-Total</strong></td>
<td><strong>6.88718</strong></td>
<td><strong>11.6901</strong></td>
<td><strong>3.08111</strong></td>
<td><strong>0.22655</strong></td>
<td><strong>0</strong></td>
<td><strong>0</strong></td>
<td><strong>21.8849</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Calm</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>41.8215</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Missing/Incomplete</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>36.2936</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
AIR ENVIRONMENT

4.8.1 AIR QUALITY
The ambient air quality with respect to the study zone of 10 km radius around the mine site forms the baseline information. The various sources of air pollution in the region are dust rising from unpaved roads, domestic fuel burning, vehicular traffic, agricultural activities, etc. The prime objective of baseline air quality monitoring is to assess existing air quality of the area. This will also be useful in assessing the conformity to standards of the ambient air quality as per standards during the mine operations.

4.8.2 AMBIENT AIR MONITORING
Ambient air monitoring was carried out on monthly basis in the surrounding areas of the mine site to assess the ambient air quality at the source. To know the ambient air quality at a larger distance i.e. in the study area of 10 km radius, air quality survey has been conducted at 6 locations over a period of three months of October, November and December-2013. Major air pollutants viz. Particulate Matter (PM$_{10}$ & PM$_{2.5}$), Sulphur Dioxide (SO$_2$), Nitrogen Dioxide (NO$_2$), representing the basic air pollutants in the region were identified for Ambient Air Quality Monitoring (AAQM). The prime objective of the baseline air monitoring was to evaluate the existing air quality of the area. This will also be useful for assessing the conformity to standards of the ambient air quality during the operation of the proposed mine.

This section describes the selection of sampling locations, methodology adopted for sampling, analytical techniques and frequency of sampling.

4.8.2.1 METHODOLOGY ADOPTED FOR AIR QUALITY SURVEY
The baseline status of the air quality in the study area has been assessed through a scientifically designed ambient air quality monitoring network. The design of monitoring network in the air quality surveillance program has been based on the following considerations:

- Meteorological conditions on synoptic scale;
- Topography of the study area;
- Representatives of regional background air quality for obtaining baseline status; and
Representatives of likely impact areas. Ambient Air Quality Monitoring (AAQM) stations were set up at 6 locations with due consideration to the above mentioned points. **Table: 4.9** gives the details of environmental setting around each monitoring station and their distances with reference to the proposed site.

**Table: 4.9 Air quality monitoring locations**

<table>
<thead>
<tr>
<th>Location</th>
<th>Distance (km)</th>
<th>Direction w.r.t plant site</th>
<th>Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kuncholi</td>
<td>0.4</td>
<td>Lease Area</td>
<td>Core</td>
</tr>
<tr>
<td>Dewana</td>
<td>0.3</td>
<td>Lease area</td>
<td>Core</td>
</tr>
<tr>
<td>Kankroli</td>
<td>6</td>
<td>NE</td>
<td>Buffer</td>
</tr>
<tr>
<td>Mochinda</td>
<td>6.1</td>
<td>West</td>
<td>Buffer</td>
</tr>
<tr>
<td>Kolora</td>
<td>7</td>
<td>SW</td>
<td>Buffer</td>
</tr>
<tr>
<td>Sanyan ki Khera</td>
<td>8</td>
<td>North</td>
<td>Buffer</td>
</tr>
</tbody>
</table>

**4.8.2.2 FREQUENCY AND PARAMETERS FOR SAMPLING**

Ambient air quality monitoring has been carried out with a frequency of two days per week at all locations covering one complete season except monsoon (CPCB guidelines). The ambient air quality parameters along with their frequency of sampling are given in **Table-4.10**.

**Table-4.10 Monitored Parameters and Frequency of Sampling**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Sampling Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM$_{10}$</td>
<td>24 hourly sample twice a week</td>
</tr>
<tr>
<td>PM$_{2.5}$</td>
<td>24 hourly sample twice a week</td>
</tr>
<tr>
<td>Sulphur Dioxide (SO$_2$)</td>
<td>24 hourly samples twice a week</td>
</tr>
<tr>
<td>Nitrogen Dioxide (NO$_2$)</td>
<td>24 hourly samples twice a week</td>
</tr>
<tr>
<td>Carbon Monoxide (CO)</td>
<td>8 hourly sample twice a week</td>
</tr>
</tbody>
</table>

**4.8.2.3 INSTRUMENTS USED FOR SAMPLING**

Respirable dust samplers (RDS) were used for monitoring of Respirable Particulate Matter (PM$_{10}$ & PM$_{2.5}$) and gaseous pollutants like SO$_2$ and NO$_2$.

**4.8.2.4 SAMPLING AND ANALYTICAL TECHNIQUES**

Sampling and analysis was done as per guidelines issued by CPCB/MoEF. The techniques used for ambient air quality monitoring and technical protocols are given in **Table-4.10**.

**Table 4.10 Techniques Used For Ambient Air Quality Monitoring**

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Parameters</th>
<th>Technique</th>
<th>Technical Protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>PM$<em>{10}$ &amp; PM$</em>{2.5}$</td>
<td>Respirable Dust Sampler</td>
<td>IS-5182(Part-IV)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Gravimetric Method)</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Sulphur Dioxide</td>
<td>Modified West and Gaeke</td>
<td>IS-5182(Part-II)</td>
</tr>
<tr>
<td>3.</td>
<td>Nitrogen Oxide</td>
<td>Jacob &amp; Hochhelser</td>
<td>IS-5182(Part-VI)</td>
</tr>
</tbody>
</table>
Table 4.11 (a) Summary of the Air Monitoring Result

<table>
<thead>
<tr>
<th>Location</th>
<th>PM10 Max.</th>
<th>Min.</th>
<th>Avg</th>
<th>98%ile</th>
<th>PM2.5 Max.</th>
<th>Min.</th>
<th>Avg</th>
<th>98%ile</th>
<th>SO2 Max.</th>
<th>Min.</th>
<th>Avg</th>
<th>98%ile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kuncholi</td>
<td>80</td>
<td>68.76</td>
<td>75.72</td>
<td>79.9</td>
<td>75.21</td>
<td>35.86</td>
<td>55.35</td>
<td>73.7</td>
<td>15.0</td>
<td>6.24</td>
<td>11.08</td>
<td>14.7</td>
</tr>
<tr>
<td>Dewana</td>
<td>78.56</td>
<td>66.97</td>
<td>72.83</td>
<td>79.6</td>
<td>46.53</td>
<td>39.88</td>
<td>43.205</td>
<td>45.59</td>
<td>11.01</td>
<td>7.65</td>
<td>9.37</td>
<td>10.9</td>
</tr>
<tr>
<td>Kankroli</td>
<td>80</td>
<td>69.98</td>
<td>75.85</td>
<td>79.6</td>
<td>43.76</td>
<td>34.32</td>
<td>39.04</td>
<td>42.88</td>
<td>13.0</td>
<td>8.67</td>
<td>10.63</td>
<td>12.9</td>
</tr>
<tr>
<td>Mochinda</td>
<td>80</td>
<td>61.65</td>
<td>71.39</td>
<td>79.9</td>
<td>44.21</td>
<td>34.79</td>
<td>39.5</td>
<td>43.32</td>
<td>12.76</td>
<td>6.14</td>
<td>9.10</td>
<td>12.5</td>
</tr>
<tr>
<td>Kolora</td>
<td>80</td>
<td>65.09</td>
<td>74.04</td>
<td>79.9</td>
<td>44.05</td>
<td>37.05</td>
<td>40.55</td>
<td>43.16</td>
<td>14.01</td>
<td>10.01</td>
<td>11.94</td>
<td>13.8</td>
</tr>
<tr>
<td>Sanyan ki Khera</td>
<td>75.84</td>
<td>68.32</td>
<td>71.93</td>
<td>75.1</td>
<td>42.65</td>
<td>39</td>
<td>40.825</td>
<td>41.79</td>
<td>11.74</td>
<td>8</td>
<td>9.98</td>
<td>11.4</td>
</tr>
</tbody>
</table>

Table 4.11(b) Summary of the Air Monitoring Result

<table>
<thead>
<tr>
<th>Location</th>
<th>NO2 Max.</th>
<th>Min.</th>
<th>Avg</th>
<th>98%ile</th>
<th>CO Max.</th>
<th>Min.</th>
<th>Avg</th>
<th>98%ile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kuncholi</td>
<td>23.65</td>
<td>14.45</td>
<td>19.82</td>
<td>22.7</td>
<td>0.47</td>
<td>0.33</td>
<td>0.38</td>
<td>0.4</td>
</tr>
<tr>
<td>Dewana</td>
<td>23.54</td>
<td>19</td>
<td>21.09</td>
<td>23.5</td>
<td>0.41</td>
<td>0.32</td>
<td>0.35</td>
<td>0.4</td>
</tr>
<tr>
<td>Kankroli</td>
<td>22.89</td>
<td>17.34</td>
<td>19.69</td>
<td>22.7</td>
<td>0.45</td>
<td>0.31</td>
<td>0.35</td>
<td>0.4</td>
</tr>
<tr>
<td>Mochinda</td>
<td>24.45</td>
<td>15.88</td>
<td>20.04</td>
<td>24.0</td>
<td>0.47</td>
<td>0.33</td>
<td>0.39</td>
<td>0.46</td>
</tr>
<tr>
<td>Kolora</td>
<td>24.6</td>
<td>18.76</td>
<td>21.79</td>
<td>24.0</td>
<td>0.49</td>
<td>0.33</td>
<td>0.40</td>
<td>0.48</td>
</tr>
<tr>
<td>Sanyan ki Khera</td>
<td>22.90</td>
<td>18</td>
<td>20.66</td>
<td>22.7</td>
<td>0.52</td>
<td>0.3</td>
<td>0.46</td>
<td>0.51</td>
</tr>
</tbody>
</table>

4.8.2.5 PRESENTATION OF RESULTS

Summary of the analysis results for the study period are presented in detail in Table-4.11(a-b). The summary of these results for all the locations is presented in Table-4.10. These are compared with the standards prescribed by Central Pollution Control Board (CPCB).

RESULT

Ambient Air Quality Monitoring reveals that the concentrations of PM10, PM2.5, SO2, NO2 & CO for all the 6 AAQM stations were found within prescribed Limit. Ambient Air Quality Monitoring reveals that the concentrations of PM10 for all the 6 AAQM stations were found between 61.65 to 80.0 μg/m3. PM2.5 value found between 34.32 to 75.21 μg/m3.

As far as the gaseous pollutants SO2 and NO2 are concerned, the prescribed CPCB limit of 80 g/m3 has never surpassed at any station. The concentrations of SO2 were found in range of 6.14 to 15.0 g/m3. The concentrations of NO2 were found in range of 14.45 to 24.6 g/m3. The Concentration of CO were found in range of 0.3 to 0.52mg/m3.

4.9 MINERALOGICAL COMPOSITION FOR PM10

RSPM is “defined as the component of inhaled respirable dust small enough to reach the pulmonary or alveolar region of the lung”.

Table 4.12 Mineralogical Composition of PM10, Post Monsoon 2013

<table>
<thead>
<tr>
<th>Location</th>
<th>Free Silica μg/m3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min.</td>
<td>Max.</td>
</tr>
<tr>
<td>Kuuncholi</td>
<td>38.65</td>
</tr>
<tr>
<td>Dewana</td>
<td>44.8</td>
</tr>
<tr>
<td>Kankroli</td>
<td>36.99</td>
</tr>
</tbody>
</table>
4.10 NOISE ENVIRONMENT

4.10.1 NOISE ANALYSIS WITHIN THE STUDY AREA

A preliminary reconnaissance survey has been undertaken to identify the major noise generating sources in the area. Noise at different noise generating sources has been identified based on the residential, industrial and commercial activities in the area. The noise monitoring has been conducted for determination of noise levels at 6 locations covering both core and buffer zones in the study area. The noise levels at each location were recorded for 24-hrs. The environment setting of each noise monitoring location is given in following Table.

<table>
<thead>
<tr>
<th>Location</th>
<th>Distance (km)</th>
<th>Direction w.r.t plant site</th>
<th>Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kuncholi</td>
<td>0.4</td>
<td>Lease Area</td>
<td>Core</td>
</tr>
<tr>
<td>Dewana</td>
<td>0.3</td>
<td>Lease area</td>
<td>Core</td>
</tr>
<tr>
<td>Kankroli</td>
<td>6</td>
<td>NE</td>
<td>Buffer</td>
</tr>
<tr>
<td>Mochinda</td>
<td>6.1</td>
<td>West</td>
<td>Buffer</td>
</tr>
<tr>
<td>Kolora</td>
<td>7</td>
<td>SW</td>
<td>Buffer</td>
</tr>
<tr>
<td>Sanyan ki Khera</td>
<td>8</td>
<td>North</td>
<td>Buffer</td>
</tr>
</tbody>
</table>

4.10.2 Method of Monitoring

Sound Pressure Levels (SPL) measurements were recorded at six locations. The readings were taken for every hour for 24-hrs. The day noise levels have been monitored during 6 am to 10 pm and night noise levels during 10 pm to 6 am at all the locations. Measured noise level displayed as a function of time provides a useful scheme for describing the acoustical climate of a community. Noise levels recorded at each station are computed for equivalent noise levels. Equivalent noise level is a single number descriptor for describing time varying noise levels. The equivalent noise level is defined as mathematically:

\[10\log \frac{1}{T} \sum (10\log L)\]

Where

- \(L\) = sound pressure level a function of time dB (A)
- \(T\) = Time interval of observations

Noise levels during the night time generally drop, therefore to compute Equivalent noise levels for the night time, noise levels are increased by 10 dB (A) as the night time high noise levels are judged more annoying compared to the day time.

<table>
<thead>
<tr>
<th>Location</th>
<th>Noise Level dB(A)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Day Equivalent (L_{day})</td>
<td>Night Equivalent (L_{night})</td>
<td></td>
</tr>
<tr>
<td>Kuncholi</td>
<td>42.3</td>
<td>34.1</td>
<td></td>
</tr>
<tr>
<td>Dewana</td>
<td>42.1</td>
<td>35.4</td>
<td></td>
</tr>
<tr>
<td>Kankroli</td>
<td>53.7</td>
<td>44.4</td>
<td></td>
</tr>
</tbody>
</table>
4.10.3 OBSERVATIONS OF RESULTS
The noise levels at all the locations are observed to be in the range of 34.1 dB (A) to 53.7 dB (A). The maximum noise level of 53.7 dB (A) was observed at Kankroli and the minimum noise level of 34.1 dB (A) was observed at Kuncholi during the study period. It is observed that the noise levels are in accordance to the prescribed limits.

4.11 BIOLOGICAL ASPECTS
Plant and animal communities are indicators of the environment. They respond not only to one environmental factor but also to an interactive group of factors. These communities influence and react sensitively to change in the balance of environmental stresses. Depletion of biodiversity is mainly due to intense anthropogenic pressure owing to “Population Explosion” mainly for expansion of agriculture, over grazing and illicit felling, shifting cultivation, development activities like irrigation, construction of hydro-electric dams, road construction including mining activities – all leading to dysgenic selection. Rational use of the resources is therefore; quite important in the management of biodiversity, the habitat, species and gene pools prevalent in an area, because once it is lost, it becomes an uphill task to reverse the process. Therefore, a detailed knowledge of the diversity of the area definitely helps in managing the area properly following suitable practices.

The biological study of the area has been conducted in order to understand the ecological status of the existing flora and fauna to generate baseline information and evaluate the probable impacts on the biological environment. Data have been collected from various Government Departments such as forests, agriculture, and animal husbandry and various offices and from various research papers. On the basis of primary as well as secondary data and after reviewing the research papers the final report has been prepared. All the collected data were classified to interpret the impact of pollution on the flora and fauna of that region.

<table>
<thead>
<tr>
<th>Table No 4.15 Methods used for sampling of flora and fauna</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Taxa</strong></td>
</tr>
<tr>
<td>Plants</td>
</tr>
<tr>
<td>Butterflies</td>
</tr>
<tr>
<td>Amphibians</td>
</tr>
<tr>
<td>Reptiles</td>
</tr>
<tr>
<td>Birds</td>
</tr>
<tr>
<td>Mammals</td>
</tr>
</tbody>
</table>

The Faunal studies were also conducted during the months of Oct-Dec 2013. Two schedule I species (IWPA 1972) Indian Peafowl (Pavo Cristatus) as a direct evidence in buffer area and Panther (Panthera pardus) by secondary information was observed in study area. One schedule II species Common Langur (Presbytis entellus) was observed as a secondary information in study area. Conservation plan for schedule I & schedule II species with the help of forest department is given in this chapter.
Following Flora and Fauna are found in the Core Zone of the study area as follows:

Table 4.15 (a) List of the Trees in the Core Zone of study area

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Common Name</th>
<th>Scientific name</th>
<th>Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rongh</td>
<td>Acacia leucophloea</td>
<td>Mimosaceae</td>
</tr>
<tr>
<td>2</td>
<td>Babool</td>
<td>Acacia nilotica</td>
<td>Mimosaceae</td>
</tr>
</tbody>
</table>

Table 4.15 (b) List of the Shrubs

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Common Name</th>
<th>Scientific name</th>
<th>Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jharber</td>
<td>Ziziphus nummularia</td>
<td>Rhamnaceae</td>
</tr>
<tr>
<td>2</td>
<td>Vilayti Babool</td>
<td>Prospis juliflora</td>
<td>Mimosaceae</td>
</tr>
</tbody>
</table>

Table 4.15 (c) List of Herbs

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Doodhi</td>
<td>Euphorbia hirata</td>
<td>Euphorbiaceae</td>
</tr>
<tr>
<td>2</td>
<td>Gajar Ghass</td>
<td>Parthenium hysterophorus</td>
<td>Asteraceae</td>
</tr>
</tbody>
</table>

Table 4.15 (d) List of the Grasses

<table>
<thead>
<tr>
<th>S. No</th>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jhuhi ghas</td>
<td>Alysicarpus monilifer</td>
<td>Fabaceae</td>
</tr>
<tr>
<td>2</td>
<td>Jangli-jowar</td>
<td>Sorghum halepense</td>
<td>Poaceae</td>
</tr>
<tr>
<td>3</td>
<td>Dube</td>
<td>Cynodon dactylon</td>
<td>Poaceae</td>
</tr>
<tr>
<td>4</td>
<td>Dab</td>
<td>Desmostachya bipinnata</td>
<td>Poaceae</td>
</tr>
</tbody>
</table>

FAUNA IN CORE ZONE

Table 4.16 (a) List of the Avifauna

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Common Name</th>
<th>Scientific name</th>
<th>Family</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Common Myna</td>
<td>Acridotheres tristis</td>
<td>Starnidae</td>
<td>Schedule IV</td>
</tr>
<tr>
<td>2</td>
<td>Red Collared dove</td>
<td>Streptopelia tranquearbarica</td>
<td>Columbidae</td>
<td>Schedule IV</td>
</tr>
<tr>
<td>3</td>
<td>House crow</td>
<td>Corvus splendens</td>
<td>Corvidea</td>
<td>Schedule V</td>
</tr>
<tr>
<td>4</td>
<td>Koel, Cuckoo</td>
<td>Eudynamys scolopiea</td>
<td>Cuculidae</td>
<td>Not Evaluated</td>
</tr>
</tbody>
</table>

Table 4.16 (b) List of the Mammals

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Family</th>
<th>Status in Wildlife (Protection) Act-1972</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Common House Rat</td>
<td>Rattus rattus</td>
<td>Muridae</td>
<td>Schedule V</td>
</tr>
<tr>
<td>2</td>
<td>Indian Hare</td>
<td>Lepus nigrccollis</td>
<td>Leporidae</td>
<td>---</td>
</tr>
<tr>
<td>3</td>
<td>Five striped palm Squirrel</td>
<td>Funambulus pennanti</td>
<td>Sciuridae</td>
<td>Schedule IV</td>
</tr>
</tbody>
</table>

Table 4.17 (c) List of the Reptiles

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Family</th>
<th>Status in Wildlife (Protection) Act-1972</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Common garden lizard</td>
<td>Calotes versicolor</td>
<td>Agamidae</td>
<td>---</td>
</tr>
</tbody>
</table>
Flora and Fauna are found in the Buffer Zone of the study area

**Table 4.18 (a) List of Trees in the Buffer Zone of the study area**

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Common name</th>
<th>Scientific name</th>
<th>Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Neem</td>
<td>Azadirachta indica</td>
<td>Meliaceae</td>
</tr>
<tr>
<td>2</td>
<td>Kachnar</td>
<td>Bauhinia racemosa</td>
<td>Caesalpiniaceae</td>
</tr>
<tr>
<td>3</td>
<td>Neebu</td>
<td>Citrus medica</td>
<td>Rutaceae</td>
</tr>
<tr>
<td>4</td>
<td>Gunda, Lasoda</td>
<td>Cordia dichotoma</td>
<td>Ehretiaceae</td>
</tr>
<tr>
<td>5</td>
<td>Pipal</td>
<td>Ficus religiosa</td>
<td>Moraceae</td>
</tr>
<tr>
<td>6</td>
<td>Mahua</td>
<td>Madhuca indica</td>
<td>Sapotaceae</td>
</tr>
<tr>
<td>7</td>
<td>Kher, kehda</td>
<td>Acacia catechu</td>
<td>Mimosaceae</td>
</tr>
<tr>
<td>8</td>
<td>Ronj</td>
<td>Acacia leucophloea</td>
<td>Mimosaceae</td>
</tr>
<tr>
<td>9</td>
<td>Babool</td>
<td>Acacia nilotica</td>
<td>Mimosaceae</td>
</tr>
<tr>
<td>10</td>
<td>kumtha</td>
<td>Acacia senegal</td>
<td>Mimosaceae</td>
</tr>
<tr>
<td>11</td>
<td>Bel, bili</td>
<td>Aegle marmelos</td>
<td>Rutaceae</td>
</tr>
<tr>
<td>12</td>
<td>Jamun</td>
<td>Syzygium cumini</td>
<td>Myrtaceae</td>
</tr>
<tr>
<td>13</td>
<td>Imli</td>
<td>Tamarindus indica</td>
<td>Caesalpiniaceae</td>
</tr>
<tr>
<td>14</td>
<td>Dhamn</td>
<td>Grewia tiliifolia</td>
<td>Tiliaceae</td>
</tr>
<tr>
<td>15</td>
<td>Khirni, dudhi</td>
<td>Wrightia tinctoria</td>
<td>Apocynaceae</td>
</tr>
<tr>
<td>16</td>
<td>Ghat bore</td>
<td>Ziziphus xylopyrus</td>
<td>Rhamnaceae</td>
</tr>
<tr>
<td>17</td>
<td>Mahua</td>
<td>Madhuca indica</td>
<td>Sapotaceae</td>
</tr>
<tr>
<td>18</td>
<td>Aam</td>
<td>Mangifera indica</td>
<td>Anacardiaceae</td>
</tr>
<tr>
<td>19</td>
<td>Sitafal</td>
<td>Annona Squamosa</td>
<td>Annonaceae</td>
</tr>
<tr>
<td>20</td>
<td>Bargad</td>
<td>Ficus beghalensis</td>
<td>Moraceae</td>
</tr>
</tbody>
</table>

**Table 4.18 (b) List of the Shrubs**

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Common name</th>
<th>Scientific Name</th>
<th>Family</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vajradanti</td>
<td>Barleria crista</td>
<td>Acanthaceae</td>
</tr>
<tr>
<td></td>
<td>Ber</td>
<td>Ziziphus mauritiana</td>
<td>Rhamnaceae</td>
</tr>
<tr>
<td></td>
<td>Bamboo</td>
<td>Dendrocalamus strictus</td>
<td>Poaceae</td>
</tr>
<tr>
<td></td>
<td>Nag phani</td>
<td>Opuntia elatior</td>
<td>Cactaceae</td>
</tr>
<tr>
<td></td>
<td>Vilayati babool</td>
<td>Prosopis juliflora</td>
<td>Mimosaceae</td>
</tr>
<tr>
<td></td>
<td>Thor</td>
<td>Euphorbia nivulia</td>
<td>Euphorbiaceae</td>
</tr>
<tr>
<td></td>
<td>Aak</td>
<td>Calotropis procera</td>
<td>Asclepiadaceae</td>
</tr>
</tbody>
</table>

**Table 4.18 (c) List of Herbs**

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Common name</th>
<th>Scientific Name</th>
<th>Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kanteli</td>
<td>Lepidagathis hamiltoniana</td>
<td>Acanthaceae</td>
</tr>
<tr>
<td>2</td>
<td>Gajar ghas</td>
<td>Parthenium hysterophorus</td>
<td>Asteraceae</td>
</tr>
<tr>
<td>3</td>
<td>Neel</td>
<td>Indigofera tinctoria</td>
<td>Fabaceae</td>
</tr>
<tr>
<td>4</td>
<td>Gokhru</td>
<td>Tribulus terrestris</td>
<td>Zygophyllaceae</td>
</tr>
<tr>
<td>5</td>
<td>kamaru</td>
<td>Tridax procumbens</td>
<td>Asteraceae</td>
</tr>
<tr>
<td>6</td>
<td>Ghritkumari</td>
<td>Aloe vera</td>
<td>Liliaceae</td>
</tr>
<tr>
<td>7</td>
<td>Van Tulsi</td>
<td>Ocimum gratissimum</td>
<td>Lamiaceae</td>
</tr>
</tbody>
</table>
8  Dasran  |  Rhus mysurensis  |  Anacardiaceae  
9  Arandi  |  Ricinus communis  |  Euphorbiaceae  
10  Satyanasi  |  Argimon maxicana  |  Papervaceae  
11  Doodhi  |  Euphorbia hirata  |  Euphorbiaceae  

Table 4.18 (d) List of the Grasses

<table>
<thead>
<tr>
<th>S. No</th>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dab</td>
<td>Imperata cylindrica</td>
<td>Poaceae</td>
</tr>
<tr>
<td>2</td>
<td>Dub</td>
<td>Cynodon dactylon</td>
<td>Poaceae</td>
</tr>
<tr>
<td>3</td>
<td>Lapala</td>
<td>Aristida depressa</td>
<td>Poaceae</td>
</tr>
<tr>
<td>4</td>
<td>Baman</td>
<td>Chloris dolichostachys</td>
<td>Poaceae</td>
</tr>
</tbody>
</table>

FAUNA IN BUFFER ZONE

Table 4.19 (a) List of the Avifauna

<table>
<thead>
<tr>
<th>S. No</th>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Family</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>House sparrow</td>
<td>Passer domesticus</td>
<td>Passerinae</td>
<td>Schedule IV</td>
</tr>
<tr>
<td>2</td>
<td>White backed vulture</td>
<td>Neophron perenopterus</td>
<td>Assipitridae</td>
<td>Schedule IV</td>
</tr>
<tr>
<td>3</td>
<td>Black partridge</td>
<td>Francolinus francolinus</td>
<td>Phasianidae</td>
<td>Schedule IV</td>
</tr>
<tr>
<td>4</td>
<td>Indian peafoul</td>
<td>Pavo cristatus</td>
<td>Phasianidae</td>
<td>Schedule I</td>
</tr>
<tr>
<td>5</td>
<td>Red-wattled lapwing</td>
<td>Vanellus indicus</td>
<td>Charadriidae</td>
<td>No mention</td>
</tr>
<tr>
<td>6</td>
<td>Blue rock pigeon</td>
<td>Columba olivia</td>
<td>Columbidae</td>
<td>Schedule IV</td>
</tr>
<tr>
<td>7</td>
<td>Koel</td>
<td>Eudynamus scolopaceus</td>
<td>Cuculidae</td>
<td>No mention</td>
</tr>
<tr>
<td>8</td>
<td>Coucal crowphea san</td>
<td>Centropus sinensis</td>
<td>Cuculidae</td>
<td>No mention</td>
</tr>
<tr>
<td>9</td>
<td>House crow</td>
<td>Corvus splendens</td>
<td>Corvidae</td>
<td>Schedule V</td>
</tr>
<tr>
<td>10</td>
<td>Myna Common</td>
<td>Acridotheres tristis</td>
<td>Starnidae</td>
<td>Schedule IV</td>
</tr>
<tr>
<td>11</td>
<td>Weaver bird common</td>
<td>Ploceus phillippinus</td>
<td>Ploceidae</td>
<td>Schedule IV</td>
</tr>
<tr>
<td>12</td>
<td>Red Collared dove</td>
<td>Streptopelia tranquebarica</td>
<td>Columbidae</td>
<td>Schedule IV</td>
</tr>
</tbody>
</table>

Table 4.20 (b) List of the Reptiles

<table>
<thead>
<tr>
<th>S. No</th>
<th>Common Name</th>
<th>Scientific name</th>
<th>Family</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yellow-Bellied House Gecko</td>
<td>Hemidactylus flaviviridis</td>
<td>Agamidae</td>
<td>No mention</td>
</tr>
<tr>
<td>2</td>
<td>Girgit</td>
<td>Calotes versicolor</td>
<td>Agamidae</td>
<td>No mention</td>
</tr>
<tr>
<td>3</td>
<td>Starred tortoise</td>
<td>Geochelone elegans</td>
<td>Testudinidae</td>
<td>No mention</td>
</tr>
<tr>
<td>4</td>
<td>Northern house gecko</td>
<td>Hemidactylus flaviviridis</td>
<td>Gekkonidae</td>
<td>No mention</td>
</tr>
</tbody>
</table>

Table 4.20 (c) List of the Mammals

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Family</th>
<th>Status in Wildlife (Protection) Act-</th>
</tr>
</thead>
</table>

D//FREIA/201503
1. Common Langur  
   *Presbytis entellus*  
   *Cercopithecidae*  
   Schedule II

2. Blue Bull or Nilgai  
   *Boselaphus tragocamelus*  
   *Bovidae*  
   Schedule III

3. Five striped palm squirrel  
   *Funambulus pennantii*  
   *Sciuridae*  
   Schedule IV

4. Common House Rat  
   *Rattus rattus*  
   *Muridae*  
   Schedule V

5. Panther  
   *Panthera pardus*  
   *Felidae*  
   Schedule I

6. Indian Hare  
   *Lagus nigricollis*  
   *Laparidae*  
   Schedule IV

7. Sambar  
   *Cervus unicolor*  
   *Bovidae*  
   Schedule III

8. Indian Field Mouse  
   *Mus booduga*  
   *Muridae*  
   Schedule V

9. Striped hyaena  
   *Hyena hyena*  
   *Hyaenidae*  
   Schedule IV

10. Smooth Indian otter  
    *Lutra perspicillata*  
    *Muridae*  
    Schedule V

### 4.11.1 CONSERVATION PLAN FOR SCHEDULE-I SPECIES PEACOCK (Pavo cristatus, Linnaeus, 1758)

The Indian Peafowl (*Pavo cristatus*) has been an integral part of the people of India and their culture for centuries. From religion and mythology to civilization and socio-culture, the Indian Peafowl occupies an important place in the lives of the people. In addition to this, the Indian Peafowl is well recognized for its ecological and aesthetic values, and hence aptly declared as the 'National Bird' of India in the year 1963. Since the early 1990s, there have been reports of increasing illegal trade in peafowl feathers, large-scale mortalities due to increased use of insecticides/pesticides in agricultural lands, poaching, and retaliatory killings by people. Several peafowl stronghold areas in the country are now concerned about the current declining status. A detailed biological survey of the core zone and buffer zone (10 km radius from periphery of the mining lease) was carried out giving details of flora and fauna. However, peacock which is in *schedule-I* of the wildlife (protection) Act 1972 is found in the study area.

![Peacock Image]

### CLASSIFICATION OF PEACOCK (PAVO CRISTATUS)

<table>
<thead>
<tr>
<th>S.NO</th>
<th>CLASSIFICATION</th>
<th>DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kingdom</td>
<td>Animalia</td>
</tr>
<tr>
<td>2</td>
<td>Phylum</td>
<td>Chordata</td>
</tr>
<tr>
<td>3</td>
<td>Class</td>
<td>Aves</td>
</tr>
<tr>
<td>4</td>
<td>Order</td>
<td>Galliformes</td>
</tr>
</tbody>
</table>

D//FREIA/201503

86
Family: Phasianidat
Genus: Pavo
Species: Pavo cristatus
Vernacular Name: Mor or Peacock

**Status:** This bird was recognized under Schedule I species of Wild Life Protection Act in 1972 in India.

**GENERAL DESCRIPTION**

Peacock or Indian peafowl (Pavo cristatus) is a familiar and universally known large pheasant. It is the National bird of India. The term “Peacock” is commonly used to refer to birds of both sexes. Technically, males of are Peacock, females are peahens and together they are called peafowl. The male has a spectacular glossy green long tail feathers that may be more than 60 percent of the birds total body length. These feathers have blue, golden green and copper colored acelli (eyes). The long tail feathers are used for mating rituals like courtship displays. The feathers are arched into a magnificent shape across the back of the bird and almost touching on both sides. Females do not have these graceful tail feathers. They have the fan like crest with whitish face and throat, chestnut brown crown and hind neck, metallic green upper breast and mantle, white belly and brown back rump and tail. Their primaries are dark brown.

**Habitat**

**FEATURES OF PEACOCK (PAVO CRISTATUS)**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body Length</td>
<td>180-230 cm</td>
</tr>
<tr>
<td>Weight</td>
<td>2750-6000 gm</td>
</tr>
<tr>
<td>Habitat</td>
<td>In the undergrowth in deciduous forests, near streams, tall trees for roosting</td>
</tr>
</tbody>
</table>

Size of the male tail feathers, its coloration and numbers of eyes present determine the dominance of the male in peacock hierarchy. The females are believed to be attracted towards the male with longest and most colorful tail feathers.

**Peafowl Behavior**

Peacocks are gregarious by nature. In the breeding season they are usually seen in small parties of one male with three to five females whereas in the non-breeding season they remain in separate parties of adult males and females with juveniles. Peacock roost in tall trees and emerge from the dense thickets to feed in fields and openings in forests and fields.

**Life Cycle**

**FEATURES OF LIFE CYCLE**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Call</td>
<td>Kee-ow, Kee-ow, Ka-an, Ka-an, Kok-kok, Kok-kok, cain-kok</td>
</tr>
<tr>
<td>Breeding</td>
<td>April-September</td>
</tr>
<tr>
<td>Nest side</td>
<td>On ground in undergrowth (wild), On buildings by semi-feral birds in villages</td>
</tr>
</tbody>
</table>

**Food Habit**

Peacocks are ground feeders. Indian peafowl’s do most of their foraging early in the morning and shortly before sunset. They retreat to the shade and security of the trees for the hottest portion of the day. They make a meal of grains, berries, drupes, wild figs and some cultivated crops. They can also eat insects, small reptiles and small mammals.
Conservation and Relationship with man

The great beauty and popularity of the Indian Peafowl has ensured its protection throughout most of its native ranges. It is a national bird of India. The Peafowl is prominent in the mythology and folklore of the Indian people. The Hindus consider the bird to be scared because of its association with Lord Krishna who used to wear its feathers as crown (Mor Mukut). It is also associated with the God Kartikeya, son of the Lord Shiva and Parvati and brother of Lord Ganesh. It is “Vaahan” (transport) of Lord Kartikeya.

This long and close association with humans has proven the peafowl’s adaptability of human-altered landscapes. In villages where it is protected it becomes quite tame, but it is very shy and secretive where hunted. Peacock is generally protected by the local people.

CONSERVATION STATUS

<table>
<thead>
<tr>
<th>Extinct</th>
<th>Threatened</th>
<th>Least Concern</th>
</tr>
</thead>
<tbody>
<tr>
<td>EX</td>
<td>CR</td>
<td>NT</td>
</tr>
<tr>
<td>EW</td>
<td>EN</td>
<td>LC</td>
</tr>
</tbody>
</table>

IUCN
- CR: Extinct
- EN: Endangered
- VU: Vulnerable
- NT: Near Threatened
- LC: Least Concern
- Others

Wild Life (P) Act
- Schedule-I

CITES
- Not Listed

Threats

Threats to the peacock in the area are:
- Shortage of drinking water for the birds during the hot summer days.
- Habitat loss, especially the shortage of tall tree in and around the villages for roosting and for providing shades during hot summer month.
- Causalities caused by eating chemically treated agricultural crop seeds.
- Legal hunting by some communities.

Action plan for Conservation of peafowl:

- Time series analysis of habitat change to quantify the rate of change and identify high risk areas and potential sites for further affirmative action.
- Estimation of population size by established count method such as line transect, call counts and roost counts.
- Intensive ecological investigation in reprehensive sites in major biogeography zone with focus on the effects of threats in relation to breeding success and survival probability.
- Quantification of trade, with details on source and people involved.

Conservation Measures for peacock:

Direct and indirect approach is required to provide effecting conservation, which is suggested as under:
- Increase the tree cover in the buffer area shelter and roosting of peacocks. This will be achieved by planting of tree groves (a group of trees grows close together, generally without many bushes or other plants) in buffer area.
- Some local species such as Amaltash, Neem, Ardu, Shesham, Sirsi, Palash, Peepal tree etc. will be planted. Planting of tree groves in school compounds in the villages of buffers area as per the plantation programme.
- By conducting awareness programmes (community and school level) for conservation of peacocks in the area and also through organizing competitions during “Wildlife Week” and “Van Mahotsav” celebrations.
- Encourage Afforestation activities around. The selection of plant species will be based on requirements of peafowl roosting, food, shelter.
- Some provision of rewards to informers for the control of poaching and illegal trade in wildlife.
- Water tanks, if available in the study area will be repaired in habitation zone of Peafowl.
- Suggest strategies to minimize negative impacts of changing environment in nearby area of peacock population and to promote conservation of peacock habitats.
- Another way to help preserve the endangered species is to create society dedicated to ecological ethics. All the conservation measures will be implemented with the help of and in the consultation of the state forest department Jaipur.
- With the objective of effectively protecting the wild life and to control poaching, smuggling and illegal trade in wildlife and its derivatives the government of India enacted Wild Life (Protection) Act 1972. The act was amended in January 2003 and punishment for offences under the Act has been made more stringent.

4.11.2 CONSERVATION PLAN FOR COMMON LANGAUR
(SCHEDULE-II)

Common langur or Hanuman langurs, the most widespread langurs of South Asia are a group of Old World monkeys. All taxa have traditionally been placed in the single species *Presbytis entellus*. In 2001, it was recommended that several distinctive former subspecies should be given full species status, so that seven species are recognized. Common langurs are large and fairly terrestrial, inhabiting forest, open lightly wooded habitats, and urban areas on the Indian subcontinent. Most species are found at low to moderate altitudes.

<table>
<thead>
<tr>
<th>Scientific Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kingdom</td>
</tr>
<tr>
<td>Phylum</td>
</tr>
<tr>
<td>Class</td>
</tr>
<tr>
<td>Order</td>
</tr>
<tr>
<td>Family</td>
</tr>
<tr>
<td>Subfamily</td>
</tr>
<tr>
<td>Genus</td>
</tr>
</tbody>
</table>

Traditionally, only *Presbytis entellus* was recognized as a species, the remainder all being treated as subspecies. In 2001, it was proposed that seven species should be recognized, with the majority considered monotypic. They are mostly folivorous and inhabit trees but they also walk often on the ground as well. Common langur or Hanuman langur is now endangered because of an encroaching human expansion. Often this can be attributed to their folivory and inadequate food supply. Gotch
(1979) stated that "Hanuman" is a Hindu word for a monkey god. *Presbytis* refers to an old man, while *entellus* comes from a figure in Virgil's *Aeneid*.

**DISTRIBUTION**

The bulk of the Common langur distribution is within India, and all seven currently recognized species have at least a part of their range in this country. Common langurs can adapt to a variety of habitats. They inhabit arid habitats like deserts, tropical habitats like tropical rainforests and temperate habitats like coniferous forests, deciduous habitats and mountains habitats. They can adapt well to human settlements, and are found in villages, towns and areas with housing or agriculture. They live in densely populated a city which has a population numbering up to a million.

**ECOLOGY AND BEHAVIOR**

Common langurs are diurnal. They sleep during the night in trees but also on man-made structures like towers and electric poles when in human settlements.

Common langurs are primarily herbivores. However, unlike some other coloines they do not depend on leaves and leaf buds of herbs, but will eat also coniferous needles and cones, fruits and fruit buds, evergreen petioles, shoots and roots, seeds, grass, bamboo, fern rhizomes, mosses, and lichens. Leaves of trees and shrubs rank at the top of preferred food, followed by herbs and grasses. They forage on agricultural crops and other human foods, and even accept handouts. Although they occasionally drink, langurs get most of their water from the moisture in their food.

**REPRODUCTION AND PARENTING**

In one-male groups, the resident male is usually the sole breeder of the females and sires all the young. In multiple-male groups, the highest-ranking male fathers most of the offspring, followed by the next-ranking males and even outside males will father young. Higher-ranking females are more reproductively successful than lower-ranking ones. Female common langurs do not make it obvious that they are in estrous. However, males are still somehow able to deduce the reproduction state of females. Females signal that they are ready to mate by shuddering the head, lowering the tail, and presenting their anogenital regions. Such solicitations do not always lead to copulation. When langurs mate, they are sometimes disrupted by other group members. Females have even been recorded mounting other females. The gestation period of common langur lasts around 200 days, at least at Jodhpur, India. In some areas, reproduction is year-around. Year-round reproduction appears to occur in populations that capitalize on human-made foods. Other populations have seasonal reproduction. Infanticide is common among common langurs. Most
Infanticidal langurs are males that have recently immigrated to a group and driven out the prior male. These males only kill infants that are not their own. Infanticide is more commonly reported in one-male groups, perhaps because one male monopolizing matings drives the evolution of this trait. In multiple-male groups, the costs for infanticidal males are likely to be high as the other males may protect the infants and they can’t ensure that they’ll sire young with other males around. Nevertheless, infanticide does occur in these groups, and it is suggested that such practices serve to return a female to estrous and gain the opportunity to mate. Females usually give birth to a single infant, although twins do occur. Most births occur during the night. Infants are born with thin, dark brown or black hair and pale skin. Infants spend their first week attach themselves to their mothers' chests and mostly just suckle or sleep. They do not move much in terms of locomotion for the first two weeks of their life. As they approach their sixth week of life, infants vocalize more. They use squeaks and shrieks to communicate stress. In the following months, the infants are capable of quadrupedal locomotion and can walk, run and jump by the second and third months. All oparenting occurs among langurs, starting when the infants reach two years of age. The infant will be given to the other females of the group. However, if the mother dies, the infant usually follows. Langurs are weaned by 13 months.

STATUS AND CONSERVATION

Common langurs have stable populations in some areas and declining ones in others. Black-footed langur and Kashmir gray langur are considered threatened. The latter is the rarest species of langur, with less than 250 mature individuals remaining. In India, langurs number at around 300,000, India has laws prohibiting the capturing or killing of langurs. Enforcement of these laws has proven to be difficult and it seems most people are unaware of their protection. As well mining, forest fires and explotation of wood for other uses. Langurs can be found near roads and can become victims of automobile accidents. This happens even in protected areas, with deaths by automobile collisions making nearly a quarter of mortality in Kumbhalgarh Wildlife Sanctuary in Rajasthan, India. Langurs are considered sacred in the Hindu religion and are sometimes kept for religious purposes by Hindu priests and for roadside performances. However, some religious groups use langurs as food and medicine, and parts of gray langurs are sometimes kept as amulets for good luck. Because of their sacred status and their less aggressive behavior compared to other primates, langurs are generally not considered pests in many parts of India. Nevertheless, secularization seems to have somewhat changed such attitudes. Langurs will raid crops and steal food from houses, and this causes people to persecute them. While people may feed them in temples, they do not extend such
care to monkey at their homes. Langurs stealing and biting people to get food in urban areas may also contribute to more persecutions.

4.11.3 CONSERVATION PLAN FOR SCHEDULE –I SPECIES PANTHER (*Panthera pardus* Linnaeus 1758)

**GENERAL DESCRIPTION**

Panther of schedule I of the wild life (protection) Act 1972 the species of fauna is observed in the study area on the basis of secondary information. Panthers are the most versatile of big cats and occupy all habitats from the Congo rainforest to true deserts. However, even with their remarkable adaptability.

<table>
<thead>
<tr>
<th>S. NO.</th>
<th>CLASSIFICATION</th>
<th>DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kingdom</td>
<td>Animalia</td>
</tr>
<tr>
<td>2</td>
<td>Phylum</td>
<td>Chordata</td>
</tr>
<tr>
<td>3</td>
<td>Class</td>
<td>Mammalia</td>
</tr>
<tr>
<td>4</td>
<td>Order</td>
<td>Carnivora</td>
</tr>
<tr>
<td>5</td>
<td>Family</td>
<td>Felidae</td>
</tr>
<tr>
<td>6</td>
<td>Subfamily</td>
<td>Pantherinae</td>
</tr>
<tr>
<td>7</td>
<td>Genus</td>
<td>Panthera</td>
</tr>
<tr>
<td>8</td>
<td>Species</td>
<td><em>P. pardus</em></td>
</tr>
</tbody>
</table>

Panther is extremely conservative in their choice of territory. An individual's territory is usually located in a river basin which generally extends to the natural topographical borders of the area. The territory of two individuals may sometimes overlap, but only slightly. Depending on sex, age, and family size, the size of an individual's territory can vary from 5,000–30,000 ha (19–116 sq mi). They may use the same hunting trails, routes of constant migration, and even places for extended rest constantly over the course of many years. Female Panthers with cubs are relatively often found in the proximity of deer farms. The large number of domestic deer is a reliable food source that may help to survive difficult times. In 2008, the IUCN stated that Panthers may soon move from a “Near Threatened” to “Vulnerable” status due to heavy hunting mainly for the commercial trade in Asia, persecution due to human-conflict situations, habitat loss and fragmentation. Panthers are also persecuted in Africa by local tribes who use Panther skins for ceremonial dress and body parts for traditional use. Panthers are living longer, people are killing fewer cats, and the population is growing. Females are also having more cubs.

**BEHAVIOUR**

Panther is extremely conservative in their choice of territory. An individual's territory is usually located in a river basin which generally extends to the natural topographical borders of the area. The territory of two individuals may sometimes overlap, but only slightly. Depending on sex, age, and family size, the size of an individual's territory can vary from 5,000–30,000 ha (19–116 sq mi). They may use the same hunting trails, routes of constant migration, and even places for extended rest constantly over the course of many years. Female Panthers with cubs are relatively often found in the proximity of deer farms. The large number of domestic deer is a reliable food source that may help to survive difficult times. Male Panthers don't help raise cubs, but they do provide essential security for females who share their home, protecting them from new males who routinely kill cubs to improve the chances of mating. With the constant killing of male Panthers, females were trapped in a cycle where resident males were not around long enough to guard the cubs from intruding males. Reducing the number of male Panthers killed has helped to re-establish stability, and females now have a safe
window in which to raise their young. River sand mining activity will not disturb the habitat and habitat condition of Panther whereas if Panther is observed in the study area rescues and preventive measures will be taken.

**Conservation Practice:**
- a comprehensive education program for school children, Conference and students in the Panther range
- media campaign to create awareness about the Panther's plight
- To inform the forest department if Panther is seen the Buffer area and make all efforts to send them back into safe zone.

**Reintroduction into the wild**
There are two sources of Panthers for reintroduction: Panthers born and raised in zoos and Panthers raised in a special reintroduction center passed through a rehabilitation program for life in the wild. If this reintroduction is to succeed, it is clear that the design of the breeding and release centre, and the management of the Panthers in it, must focus strongly on overcoming the difficulties imposed by the captive origin of the cats. Three necessary behaviors should be acquired prior to release: hunting and killing of live natural prey; avoidance of humans and avoidance of tigers.

**CONSERVATION MEASURE FOR ALL SCHEDULED FAUNA**
Direct and indirect approach is required to provide effecting conservation, which is suggested as under.

- Some provision of rewards to informers for the control of poaching and illegal trade in wildlife.
- Suggest strategies to minimize negative impacts of changing environment in nearby area of population and to promote conservation of habitats.
- Another way to help preserve the endangered species is to create society. Dedicated to ecological ethics. All the conservation measures will be implemented with the help of and in the consultation of the state forest department.
- Organized workshop for conservation awareness –
- A series of conservation awareness workshops for village and school children should be conducted in the different villages. Interactive discussion will be carried out participants.

- Some local species such as Amaltash, Neem, Ardu, Shesham, Sirsi, Palash, Peepal tree etc will be planted. Planting of tree groves in school compounds in the villages of buffers area as per the plantation programme.
- Encourage Afforestation activities around or close to habitation. The selection of plant species will be based on requirements of, food, shelter.
- Some provision of rewards to informers for the control of poaching and illegal trade in wildlife.
- Small water tank will be repaired in habitation zone if available in study area.
- Suggest strategies to minimize negative impacts of changing environment in nearby area of to promote conservation.
- Another way to help preserve the endangered species is to create society dedicated to ecological
ethics. All the conservation measures will be implemented with the help of and in the consultation of the state forest department.

- With the objective of effectively protecting the wild life and to control poaching, smuggling and illegal trade in wildlife and its derivatives the government of India enacted Wild Life (Protection) Act 1972. The act was amended in January 2003 and punishment for offences under the Act has been made more stringent.

**Budget for conservation**
The total budget for conservation will be Rs. 85 thousand that will be expenditures in Construct Plantation of fruits, shady and grasses species, repairing of small water tank and Training and awareness programme.

The Biodiversity budgetary provision of conservation for schedule I Fauna Pea Fowl (*Pavo cristatus*) and for schedule II Fauna Langur (*Presbytis entellus*) for one year are as follows:-

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Conservation Activities</th>
<th>Expenditures in Rs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Plantation</td>
<td>30,000</td>
</tr>
<tr>
<td>2</td>
<td>Maintenance of Plants</td>
<td>15,000</td>
</tr>
<tr>
<td>3</td>
<td>Workshops, Training &amp; Awareness programs</td>
<td>20,000</td>
</tr>
<tr>
<td>4</td>
<td>Monitoring and counting of scheduled Fauna in of project areas</td>
<td>10,000</td>
</tr>
<tr>
<td>5</td>
<td>Providing water and forage facilities and repairing of available ponds etc</td>
<td>10,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>85,000</strong></td>
</tr>
</tbody>
</table>

4.11.4 IMPACT OF MINING ON PLANKTON
The core zone is the river sand bed so there in no vegetation pattern. However River is non perennial that dries up during the summer season. The less or more water in the river is seen only in monsoon season and rest of the duration of the year it remains dry. Some water bodies of very less dimension and shallow in depth may be visible in the river bed due to some small check dams, while in some part of river big size boulders and exposure of basement rock is also visible.
During the entire lease period, River Sand Mining will be restricted to 3.0 meter depth from the river bed and will be kept above 1-2 meter from the water table. Mining will be avoided during the monsoon season and heavy rain. River sand mining activity will have negligible effect on planktons, found as results of our study.

<table>
<thead>
<tr>
<th>Table No. 4.42 List of Planktons</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>S. No.</strong></td>
</tr>
<tr>
<td>1</td>
</tr>
</tbody>
</table>
| 2 | Zooplankton | Dynoflagelate  
|   |             | Cocolithophores  
|   |             |  
|   | Protozoa    |  
|   | Nebalia,    |  
|   | Amoeba      |  
|   | Phacus      |  
|   | Diffulugia  |  
|   | Vorticella sp. |  
|   | Stentor sp. |  
|   | Rotifera    |  
|   | Brachionus calciflorus |  
|   | B. caudatus |  
|   | B. rubens   |  
|   | Keratella tropica |  
|   | Lecane luna |  
|   | Asplanchna. |  
|   | Cladocera   |  
|   | Ceriodaphnia cornuta |  
|   | Daphnia carinata |  
|   | Moina macroscopa |  
|   | Chydorus ovalis |  
|   | Calanoids   |  
|   | Heliodiaptomus Neodiaptomus |  
|   | Insecta     |  
|   | Larvae of Ephemeroptera |  
|   | Larvea of Diptera |  
|   | And commonly found are |  
|   | Crustacean’s larva |  
|   | Larva of fish |  

### 4.12 SOCIO-ECONOMIC ENVIRONMENT

The growth of industrial sectors and infrastructure developments in villages and towns is bound to create its impact on the socio-economic aspects of the local population. The impacts may be positive or negative depending upon the developmental activity. To assess the impacts on the socio-economics of the local people, it is necessary to study the existing socio-economic status of the local population, which will be helpful for making efforts to further improve the quality of life in the area of study. To study the socio-economic aspects of people in the study area around proposed mine, the required data has been collected from various secondary sources and supplemented by the primary data generated through the process of a limited door to door socioeconomic survey.

#### 4.12.1 SOCIO-ECONOMIC SURVEY

A survey was conducted to collect the primary data on socio-economic condition and to know people’s perception on river sand mining activities. Survey was conducted in the villages of core area where the lease is proposed. The logic of selection of core area is that the local people of said villages will be directly affected by mining activities.

#### 4.12.1.1 METHODOLOGY
To identify socio-economic impact of river sand mining, a field survey was conducted. Experienced and qualified field staffs were engaged to collect field data through proper developed questionnaires. Proper orientation and training was given to investigators for survey. The target groups were selected from villages of core and buffer area. Participatory and questionnaire survey method were adopted to collect data. Focus Group Discussion (FGD) and Participatory Rural Appraisal (PRA) techniques are the two important tools of participatory method used in the field. Household level contacts and interviews have been undertaken with each family for completing the household socio-economic profile. For individual farmers and community members, qualitative interviews were used since this approach allows a more in-depth investigation into the each interviewee. It also allows people to speak for themselves without their answers being biased by predetermined hypothesis-based questions. The questionnaire was basically focused to gather respondents’ views from the study areas on the impacts of river sand mining.

4.12.1.2 EMPLOYMENT GENERATION
The proposed river sand mining project will help in generating newer employment opportunity both directly and indirectly. The core and buffer area will be benefitted as the employment preference will be given to locals. As the education level of the local area is low, employment might help create livelihood to the people. The proposed project will bring in job opportunities both during operational phase. The man power requirement is based on quantity of production and transportation technology. The area is considered backward from employment point of view. A number of skilled and unskilled people are employed but as we go away from urban area the agriculture is only source of livelihood. The region being located in the arid region the agriculture base on rainfall only which uncertain. Hence the population in general does not have opportunities of earning from either agriculture or any other employment. In this situation the river sand mining will provide some employment to the local people.

The indirect employment opportunity in the form of hiring trucks and Tractors skilled and unskilled labor will also be generated due to mining. Small shops and other business avenues will also be emerged.

The study area is still lacking in education, health, housing, water, electricity etc. It is expected that same will improve to a great extent due to proposed mining project and associated industrial and business activities. It is therefore suggested that extraction of minerals should be taken up on regular basis during the post monsoon period. This will dredge the river bed on regular basis, regulate the course of the river and check flooding of the catchment area.

4.12.2 REVIEW OF DEMOGRAPHIC AND SOCIO-ECONOMIC PROFILE -2011
The information on socio-economic aspects of the study area has been compiled from secondary sources, which include various public offices as indicated in the above section. The sociological aspects of this study include human settlements, demography, social such as Scheduled castes and Scheduled Tribes and literacy levels besides infrastructure facilities available in the study area. The economic aspects include occupational structure of workers. There are 26 villages falling within the core zone. The entire mine lease area is Govt. lands and falls under Rajsamand district.

The requirement of unskilled semi skilled workers for the mining and transportation of minerals to market will be limited to about 23. The workers directly engaged for mining activity will be deployed for collection of minerals and loading it into tractor trolleys/tipper trucks. About 50 Trucks (20 Ton each) will be engaged daily as per demand. It is pertinent to mention that percentage of marginal workers in the district is 19.33 % and non worker is 48.63% percent as per 2011 census.
Thus the project would give fruitful employment to local workers and will help in stemming or at the least lessening the migration of such workers to urban centre from the village.

4.12.3 OCCUPATIONAL STRUCTURE IN BUFFER ZONE

In the initial stages, the shift of resources occurs away from the, primary sector (agriculture, forestry, fishery, dairy, poultry, mining etc.) to the manufacturing sector or the secondary sector. These two sectors are the commodity producing sectors and their activities are required to be supported by the appropriate and adequate development of the service sector, or the tertiary sector. Occupational structure of the workforce will be indicative of the economic activity. Any change in occupational structure would be indicative of the changing nature economically. The occupational structure has been worked out for categories of occupational available in the project buffer zone, which includes cultivators, agricultural labor, and household industry workers etc.

4.12.4 HEALTH STATUS

Health of the people is not only a desirable goal, but is also essential investment in human resources. As per the National Health Policy (1983) primary health center has been accepted as a main instrument for achieving this goal.

For the development and strengthening of rural health infrastructure through a three tier system, such as Sub Centers, Primary Health Centers (PHC) and Community Health Centers have been established.

4.12.5 AWARENESS AND OPINION ABOUT THE PROJECT

- The respondents from almost of all the villages are aware about this project activity.
- The respondents have mixed view about the project. Most of the respondents have opinion that due to proposed project activity, economy of the villages will be improved.
- As regards the respondents from the nearby villages also shown favorable opinion about activity that it may lead to increase in infrastructural facilities, job opportunities and business opportunities in the project area.
- People from the villages under the study area have put their opinion and willingness for the allotment of the land for the project.

4.13 DEMOGRAPHIC STRUCTURE

Total population of the area is 195363 persons out of which 98284 (50.31%) are male and 97079 (49.69%) are female. Representation of Scheduled Cast and Scheduled Tribe population is only 10.93 and 23.17% respectively. Tribal population is high in comparing to other districts of Rajasthan. The table No. 4.18 shows that out of total population 14.78% population lives in core area and rest of 74.41% population live in buffer zone. In general, the female population is less in all three categories i.e. general, scheduled cast and scheduled tribe.

Table 4.18 Demography of study areas

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Range</th>
<th>No. of Village</th>
<th>Population</th>
<th>Population SC</th>
<th>Population ST</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>1</td>
<td>Core Area</td>
<td>26 (14.78)</td>
<td>49995</td>
<td>25342</td>
<td>24653</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(25.59)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Buffer Area</td>
<td>150 (85.22)</td>
<td>145368</td>
<td>72942</td>
<td>72426</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(74.41)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>176</td>
<td>195363</td>
<td>98284</td>
<td>97079</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(50.31)</td>
<td>(49.69)</td>
<td></td>
</tr>
</tbody>
</table>

(Figure in parenthesis is %)  

Source: - Rajsamand Census Hand Book 2011

Figure 4.12 Graphical Representation of Demography of Study Area
4.13.1 WORK FORCE

River sand mining is labor oriented mining because it covers large area. Hence requires large population of man and women for excavation, loading, transportation and storage work. From employment point of view, labors are low paid worker. They prefer to be engaged in nearby area so as to save the travel cost and time. Therefore availability of worker in villages of core area of mining is important. The Table No. 4.19 presents statistics of work force available in core as well as buffer zone. The total population in the region is 195263 persons out of which 51.36% are working and 48.64% are Non working population. In core area the total population is 49995 (14.78%) persons out of which working population is only 25530 (25.44%). The male and female population is 14737 and 10739 respectively. The percentage of marginal worker is 37.64. This population is potential from job seeking point of view.

Table 4.19 Working and Non Working Population of study area

<table>
<thead>
<tr>
<th>S. No</th>
<th>Range</th>
<th>Total Village</th>
<th>Total Population</th>
<th>Working Population</th>
<th>Main Working</th>
<th>Marginal Working</th>
<th>Non Working</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total</td>
<td>Male</td>
<td>Female</td>
<td>Total</td>
</tr>
<tr>
<td>1</td>
<td>Core Area</td>
<td>26</td>
<td>49995 (14.78)</td>
<td>25530</td>
<td>14737</td>
<td>10739</td>
<td>16775</td>
</tr>
<tr>
<td>2</td>
<td>Buffer Area</td>
<td>150</td>
<td>145368 (85.22)</td>
<td>74819</td>
<td>41650</td>
<td>33169</td>
<td>45798</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>176</td>
<td>195363</td>
<td>100349</td>
<td>56387</td>
<td>43908</td>
<td>62573</td>
</tr>
</tbody>
</table>
Fig: 4.32 Working and Non Working Population of Study Area

Among the worker there are two category i.e. main worker and marginal worker. Main worker are those who work for the major part of the year i.e. 183 days or more and marginal worker is one who work for less than 6 months in a year. Other category is of non worker, those who are either under the age of 15 years or more than 64 years. This class is not fit for any work. Hence availability of work force in the core zone is very less. One has to bring the worker far from the work place.

4.13.2 OCCUPATIONAL STRUCTURE

Occupational structure of an area shows the nature and status of employment activities in the area. Out of the total population about 51.36% population is working which is further grouped in eight fold classification as shown in table No. 4.20. Main working population of this area falls in ‘Main other working’ category. The occupation of this category is secondary and tertiary of nature. Nathdwara is famous for Srinathji temple. Hence people are engaged in hotel industries, transportation and other allied activities. Second main occupation of people in this area is agriculture. 20.58% of working population is cultivator. 14.63% are marginal cultivators and 11.77% are engaged as agriculture labor.

Table 4.20 Occupational Structure

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Range</th>
<th>Total Village</th>
<th>Total Population</th>
<th>Working Population</th>
<th>Main Cultivator</th>
<th>Main Agriculture labour</th>
<th>Main Household Industries</th>
<th>Main Other Working</th>
<th>Marginal Cultivator</th>
<th>Marginal Agriculture Labour</th>
<th>Marginal Household Industries</th>
<th>Marginal Other Working</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Core Area</td>
<td>26</td>
<td>49995 (14.78)</td>
<td>25530 (25.44)</td>
<td>5635</td>
<td>2427</td>
<td>649</td>
<td>8049</td>
<td>3733</td>
<td>2147</td>
<td>597</td>
<td>2278</td>
</tr>
<tr>
<td>2</td>
<td>Buffer Area</td>
<td>150</td>
<td>145368 (85.22)</td>
<td>74819 (75.56)</td>
<td>15020</td>
<td>6331</td>
<td>1140</td>
<td>23307</td>
<td>10936</td>
<td>9661</td>
<td>985</td>
<td>7408</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>176</td>
<td>195363 (51.36)</td>
<td>100349 (20.58)</td>
<td>20655</td>
<td>8758</td>
<td>1789</td>
<td>31356</td>
<td>14669</td>
<td>11808</td>
<td>1582</td>
<td>9686</td>
</tr>
</tbody>
</table>

Working and Non Working Population

<table>
<thead>
<tr>
<th></th>
<th>CORE ZONE</th>
<th>BUFFER ZONE</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core</td>
<td>195363</td>
<td>145368</td>
<td>95014</td>
</tr>
<tr>
<td>Buffer</td>
<td>25530</td>
<td>70549</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>49995</td>
<td>24465</td>
<td></td>
</tr>
</tbody>
</table>

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4.13.3 Literacy

Literacy in any region is key for socio-economic progress and the Indian literacy rate grew to 74.04% in 2011 from 12% at the end of British rule in 1947. Although this was a greater than six-fold improvement, the level is well below the world average literacy rate of 84% and of all nations, India currently has the largest illiterate population.

The table shows out of total population only 102888 (52.66%) are literates and 92475 (47.34%) are illiterates. If we look at male-female ratio, there is a wide gender disparity. Out of total literate population there are 62.22% male are literates while female literates are 37.78% only in the region. Among illiterates there are 38.14% male and 61.86% females to total illiterates. This analysis shows that literacy in the region is low. Hence the potential availability of unskilled labor is more in this region.

4.13.4 INFRASTRUCTURE FACILITIES

Infrastructure is basic physical and organizational structures needed for the operation of a society or enterprise, or the services and facilities necessary for an economy to function. It can be generally defined as the set of interconnected structural elements that provide framework supporting an entire structure of development. It is an important term for judging a country or region's development. The term typically refers to the technical structures that support a society, such educational institutions, medical facilities banking facilities, telecommunications and so forth, and can be defined as "the
physical components of interrelated systems providing commodities and services essential to enable, sustain, or enhance societal living conditions.

4.13.5 EDUCATION FACILITIES

Education is important as it gives knowledge about happenings around us. It develops a perspective of looking at life in us and helps us build opinions as well as have points of view on things in life. It equips us with everything that is required to make our life sensible.

The table No. 4.22 shows the educational facilities available in the villages of core area as well as buffer area of river sand mine. Every village has at least primary school in both of core as well as buffer area villages. There are 65 middle and 19 secondary schools in the study area. There are 4 Sr. Sec. schools and 11 Adult Literacy Centers present in the study area.

<table>
<thead>
<tr>
<th>S. No</th>
<th>Range</th>
<th>Total Village</th>
<th>Primary School</th>
<th>Middle School</th>
<th>Secondary School</th>
<th>Sr. Secondary School</th>
<th>Adult Literacy Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Core Area</td>
<td>26</td>
<td>45</td>
<td>16</td>
<td>9</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Buffer Area</td>
<td>150</td>
<td>140</td>
<td>49</td>
<td>10</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>176</td>
<td>185</td>
<td>65</td>
<td>19</td>
<td>4</td>
<td>11</td>
</tr>
</tbody>
</table>

4.13.6 MEDICAL FACILITIES

The data reveals that the area is lacking in medical facilities as no village in the core area has medical facility. Out of 176 villages only 56 villages have the medical facilities. There are 33 Primary health sub centres, 19 Ayurvedic dispensaries and only 9 Primary health centre in the region. The table shows that the region is very poor in medical facilities even after the introduction of Centrally Sponsored NRHM Program in the state.

<table>
<thead>
<tr>
<th>S No</th>
<th>Range</th>
<th>Total Village</th>
<th>Medical Facilities</th>
<th>Child Welfare Centre</th>
<th>Health Centre</th>
<th>Primary Health Centre</th>
<th>Primary Health Sub Centre</th>
<th>Allopathic Dispensary</th>
<th>Ayurvedic Dispensary</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Core Area</td>
<td>26</td>
<td>12</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>8</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Buffer Area</td>
<td>150</td>
<td>44</td>
<td>1</td>
<td>3</td>
<td>6</td>
<td>25</td>
<td>2</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>176</td>
<td>56</td>
<td>3</td>
<td>6</td>
<td>9</td>
<td>33</td>
<td>4</td>
<td>19</td>
</tr>
</tbody>
</table>

The field investigation has revealed that for petty health problem most of the villagers visit nearby dispensaries or hospitals located in the study area. However, during emergency and long treatment they rush to district or sub-district hospitals or the hospitals located at nearby town. Field survey has revealed that the health care institutions located in the villages are not fully equipped with manpower, medicines, equipment and ambulances.
4.13.7 Drinking Water Facility
Drinking water is a basic need for survival of mankind. There are a number of central and state sponsored programme are running in the state, but the table 4.24 shows that all the villages have ground water facility.

<table>
<thead>
<tr>
<th>S. No</th>
<th>Range</th>
<th>Total Village</th>
<th>Well Water</th>
<th>Tank Water</th>
<th>Tube Well Water</th>
<th>Hand Pump</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Core Area</td>
<td>26</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>Buffer Area</td>
<td>150</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>176</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td>Yes</td>
</tr>
</tbody>
</table>

4.14 TRAFFIC ANALYSIS
Traffic analysis is carried out by understanding the existing carrying capacity of the roads near to the project site and the connecting main roads in the area. The roads connect from the mine site to National Highway No.76. These roads are wide enough to facilitate easy and smooth movement of heavy duty trucks. Then depending on the capacity of the mine, the number of trucks that will be added to the present scenario will be compared to the carrying capacity. Traffic analysis is carried out by understanding the existing carrying capacity of the roads near to the mining site and the connecting main roads in the area. Then depending on the capacity of the mine, the number of trucks that will be added to the present scenario will be compared to the carrying capacity. Traffic density measurements were performed at two locations near Mine Site and near-National Highway-8. The Monitoring was performed in October 2013 Traffic density measurements were made continuously for 24 hours by visual observations and counting of vehicles under three categories viz. heavy motor vehicles, light motor vehicles and two wheelers. As traffic densities on the roads are high, two skilled persons were deployed simultaneously at each station during each shift-one person on each of the two directions for counting the traffic. At the end of each hour, fresh counting and recording was undertaken. Total numbers of vehicles per hour under the three categories were determined. The results of measurements are given in Table No. 4.46.

<table>
<thead>
<tr>
<th>Traffic Vehicle category</th>
<th>No. of vehicles per day near Mine site (Nathdwara Tehsil)</th>
<th>No. of vehicles per day Near National Highway-8</th>
</tr>
</thead>
<tbody>
<tr>
<td>2Wh</td>
<td>21</td>
<td>78</td>
</tr>
<tr>
<td>H.M.V.</td>
<td>103</td>
<td>123</td>
</tr>
<tr>
<td>L.M.V.</td>
<td>140</td>
<td>194</td>
</tr>
<tr>
<td>Total</td>
<td>264</td>
<td>395</td>
</tr>
</tbody>
</table>

Source: Traffic Survey

During Mine operation

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposed Capacity</td>
<td>281000 tons per annum say as 2.81 Lac ton</td>
</tr>
<tr>
<td>No. of working days</td>
<td>280</td>
</tr>
<tr>
<td>Truck Capacity</td>
<td>20 Ton</td>
</tr>
<tr>
<td>No. of trucks deployed per day</td>
<td>25</td>
</tr>
<tr>
<td>Working Hours per day</td>
<td>8</td>
</tr>
</tbody>
</table>
4.14.1 IMPACTS DUE TO TRANSPORTATION
The sand produced from the mine is to be consumed by different construction/Infrastructural projects located at Nathdwara and adjoining areas. Transportation of mined out mineral from the river bed will be transported by hired/ consumers Dumpers, Tractors, trucks. Total Production during the five years planning is 14.07 Lac Ton. About 50 trucks per day will be required in this mining project. Capacity of each truck is 20 Ton. The proposed increase in traffic density will not cause significant impact on the traffic since the connecting road and nearby Highway is capable of handling this increase in traffic density. The trucks will be properly covered with tarpaulin and overloading will not be allowed to avoid spillage on roads.
CHAPTER–5
ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

5.0 GENERAL
Mining of River sand from the riverbed shall have direct impacts on several Environmental attributes. These may be broadly classified as the physical, biological, socio-economic and or cultural components. An understanding of the existing environmental scenario of the core & buffer zone the proposed project along with the impacts of the proposed project resulting in change in the environmental components are vital to ensure the project impacts on the environment is not adverse. Environmental impacts both direct and indirect on various environmental attributes due to proposed sand mining activity in the surrounding environment, during pre-operational, operational and post-operational are discussed. An impact can be defined as any change in physical, chemical, biological, cultural and/or socio-economic environment that can be attributed to activities related to alternatives under study for meeting the project needs. Impact methodology provides an organized approach for prediction and assessing these impacts. The nature of the impacts due to said project activities are discussed and identified here. Any economic development project, whether it is a simple and small or a large and complex it has some environmental implications. The environmental implications may be beneficial or adverse, but the main objective of impact identification is to specify areas that are likely to be affected by the implementation of a project.
The objectives of impact identification are as follows:-
- To ensure compliance with regulations.
- To provide a comprehensive coverage of a full range of impacts, including social, economic and physical.
- To distinguish between positive and negative, large and small, long term and short term, reversible and irreversible impacts.
- To identify secondary, indirect and cumulative impacts as well as direct impacts.
- To consider impacts within the constraints of an area’s carrying capacity.
The proposed sand extraction operations broadly consist of collection/excavation, loading, transportation, etc., will have an impact on the following environmental attributes.
1. Land Environment
2. Water Environment
3. Air Environment
4. Noise Environment
5. Biological Environment
6. Socio-economic Environment

5.1.1 ANTICIPATED IMPACTS ON LAND ENVIRONMENT
The proposed extraction of river sand, mining below the existing streambed, and alteration of channel-bed form and shape leads to several impacts such as erosion of channel bed and banks, increase in channel slope, and change in channel morphology.
These impacts may cause:
a. Undercutting and collapse of river banks.
b. Loss of adjacent land and/or structures.
c. Upstream erosion as a result of an increase in channel slope and changes in flow velocity.
d. Downstream erosion due to increased carrying capacity of the stream.
e. Downstream changes in patterns of deposition.
f. Changes in channel bed and habitat type.

5.1.1 MITIGATION MEASURES
Since the project is mainly for sand excavation, no loss of top soil will be involved. Sand mining will be restricted up to 3 m below river bed or the water table whichever less.
i. The mining will be done in unsaturated zone, thus minimizing loss to habitat.
ii. Care will be taken to ensure that ponding is not formed in the river bed.
iii. Dredging will not be allowed.
iv. A safety zone of 45.0 m radius is being demarked for the wells located in the river bed.

Table No 5.1 Land use pattern of mining lease area at various phases

<table>
<thead>
<tr>
<th>S. No</th>
<th>Particulars</th>
<th>Present Land Use (Ha.)</th>
<th>At the End of 3rd Year (Ha.)</th>
<th>At the End of 5th Year (Ha.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mine Area</td>
<td>0.0</td>
<td>20.10</td>
<td>33.50</td>
</tr>
<tr>
<td>2</td>
<td>Dump Area</td>
<td>0.0</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>Safety Zone (Permanent Roads 6 Nos.)</td>
<td>53.56</td>
<td>56.18</td>
<td>59.18</td>
</tr>
<tr>
<td>4</td>
<td>Infrastructure (Office, Temp. Shelter etc.)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>Mineral Storage</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>Plantation</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>Un Worked</td>
<td>719.71</td>
<td>696.99</td>
<td>680.59</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>773.27</strong></td>
<td><strong>773.27</strong></td>
<td><strong>773.27</strong></td>
</tr>
</tbody>
</table>

*Source: Approved Mining Plan with Progressive Mine Closure Plan

5.1.3 SAND BUDGET & REPLENISHMENT STUDY
For ecological & environmental sustainable balance there must be a balance between river sand mining and replenishment. The imbalance may cause following measure threatening to the eco- system of the area / region, especially in arid and semi- arid region of Rajasthan.
1. Transformation of river into buried Channel.
2. Changes in abiotic environment.
3. Soil / Land erosion (especially at banks) at the time of flood.
4. Possible Changes in regional water table (may increase or decrease in pockets) or may form a local water tables.
5. Quality of groundwater may change
6. Ponding in river bed
7. Change in river course.
A Number of researchers work on sedimentation in different part of world like Darid & Higgitt & XiXi Lu (U.K.) on Upper Yangtze basin (China) taking sediment yield data from more than 250 stations and concluded that increasing soil erosion is not clearly matched by a increase in sediment yield over time and role of water conservancy projects in trapping and storing sediment requires further attention. Other author V. Subramanian ( J.N.U. Delhi ) also calculated the sediment load of Indian rivers and reveals
that the major contribution which Indian rivers make to total amount of sediment delivered to the ocean at a global scale, but also highlights the large temporal and spacial variability of riverine sediment transport in the Indian subcontinent. This variability is evident not only in the quantities of sediment transported but also in size and mineralogical characteristics of the sediment load. Over the years, considerable data have been collected concerning sediment transport in several Indian rivers. For example, Abbas & Subramanien (1984) estimated the sediment load of the Ganges at Farrakka Barrage to be 1235 t km$^{-2}$ year$^{-1}$ which is 8 times the world average erosion rate (150 t km$^{-2}$ year$^{-1}$) calculated by Milliman & Meade (1983). Under the influence of its special physiographic condition and extensive human activity, the primary patterns of surface erosion in the Upper Yangtze basin (UYB) are water erosion, gravitational erosion and combined erosion. The eroded area amounts to about 351 x 103 km$^2$, accounting for 35% of the territory of the UYB, which has an annual gross erosion of 1.57 x 1091 and an average rate of erosion of 1559 t km$^{-2}$ year$^{-1}$. Soil loss occurs primarily in the Jinsha and Jialing basins, and especially in the Lower Jinsha and Upper Jialing basins. According to the available hydrometric data, the mean annual runoff and suspended sediment yield of the UYB are 439 X 109 m$^3$ and 523 X 106 t respectively. The Jinsha and Jialing rivers are the major source of sediment, contributing 72.8% of the sediment but only 48.6% of the runoff. The high sediment yield region with $M_s > 20001$ km$^{-2}$ year$^{-1}$ occupies only 4.6% of the territory, but contributes 32.8% of the sediment load. The sediment delivery ratios of tributary watersheds lie in the range 0.4-0.61, and the average value for the entire UYB is about 0.34. The variation of measured annual sediment yields over four decades, and both statistical and qualitative analyses, indicate that the sediment yield in the UYB fluctuates in a random way with no clear tendency to increase or decrease during a long period. Soil erosion control and sediment yield reduction within the entire UYB will only be effective through sustainable, large scale and long-term soil and water conservation works. F. E. Dendy & G.C. Bottom (U.S. Department of Agriculture, Mississippi) also carried out a study on “Sediment Yield runoff drainage area relationship in the United States”. He used sediment deposition data from more than 500 reservoirs to develop relationships between sediment yield, drainage-area size, and mean annual runoff. On the average, sediment yield per unit area was inversely proportional to the 0.16 power of net drainage area for drainage areas between 1 and 30,000 square miles. Sediment yield to per unit area increased quite rapidly to about 1,860 tons per square mile per year as runoff increased from 0 to about 2 inches. It then decreased as runoff increased from 2 to about 50 inches. He developed equations 5 and 6 to relate mean sediment yield to mean annual runoff and drainage–area size. While these equations explained 75 percent of the variation in average sediment yield, we should emphasize that they were derived from average values of grouped data. Use of the equations to predict sediment yield for individual drainage basins would be unwise. Local factors, including soils, geology, topography, land use, and vegetation, may influence sediment yield much more than either runoff or drainage area. Actual sediment yield from individual drainage basins may vary 10- fold or even 100-fold from computed yield.
The equations express the general relationships between sediment yields, runoff and drainage area. They may provide a quick, rough approximation of mean sediment yield on a regional basis for preliminary watershed planning. Because we derived the equations from average values, compute sediment yield normally would be low for highly erosive areas and high for well stabilized drainage basins with high plant density. Mostly, above studies were conducted on perennial rivers, which flow all around the year, but the climatic condition of Rajasthan with having a erratic rainfall, these studies do not correlate to arid or semi-arid condition.

K. D. Sharma (Central Arid Zone Research Institute, Jodhpur) carried out a study on soil erosion and sediment yield in the Indian arid zone. He stated that High Sediment Yield is generated in the Indian arid zone due to erratic and torrential rainfall, sandy and eroded rocky drainage basins and biotic activity. Sediment Yield increases with increasing rainfall and drainage basin slope and its magnitude depends upon the nature of surface material. In recent years, it has been confirmed that high sediment yields are associated with arid/semi-arid, seasonal mediterranean and tropical conditions (Walling & Webb, 1983). A compilation of sediment yields for meso scale drainage basins suggests that arid basins export 36 times more material than humid temperate and 21 times more than humid tropical equivalents (Reid & Frostick, 1987). Bare soil is highly susceptible to replenish and washes erosion, and arid zones produce
record suspended sediment concentrations (Jones, 1981). The sediment not only causes water quality to deteriorate but also affects physical and biological conditions in the receiving systems. In the Indian arid zone, the storage capacity of small reservoirs (400 to 700 000 m$^3$) is reduced by 1.9 to 7.8% annually due to sediment deposition (Sharma & Joshi, 1982).

Hydrologically, the arid zone in India (Fig.5.3) consists of three main zones. Zone I covers 42 900 km$^2$ and receives major inputs of water from more humid regions, and supports extensive irrigated agriculture. This is a canal irrigated area and no significant sedimentation problems are encountered here. Zone II comprises sandy plains, interdunes plains, sand dunes, eroded rocky/gravelly surfaces and isolated hillocks with a poorly developed or no stream network (148600 km$^2$). It contains no integrated stream network in the conventional sense; rather, there is a system of repetitive micro-hydrology. The internal drainage basins generate high sediment yields under occasional and sporadic torrential rainfall. Zone III represents the sloping region with an integrated stream network (94 280 km$^2$). These are ephemeral channels which remain dry for 90% of the year. When runoff does occur as a direct response to torrential rainfall, flash floods result and large quantities of sediment are transported down the valleys. In this zone the infrequent nature of rainfall and runoff encourages intensive measurement programmers.

In the zone of internal drainage (zone II), the sediment yields have been estimated through measurement of sediment accumulation in small reservoirs following the recommendation of McManus & Duck (1985), and Owens & Slaymaker (1992). One hundred small reservoirs were selected by stratified random sampling from a total of 1436 reservoirs occurring in the region. The distribution of the sample was adjusted to represent the majority of the physiographic environments, soil types, vegetation and rainfall conditions. In the sandy plain and dune complex environments, the deposited sediment mainly consists of fine to very fine sand, silt and clay, overlying windblown loose sand. This layer is deposited during the summer when the reservoirs are dry and acts as a marker to identify the successive depositional cycles. The sediment deposited in the younger alluvial environment is composed of medium to fine sand and silt over which a thin layer of clay is deposited. The occasional presence of gravel in the deposits acts as a marker to identify the successive depositional cycles. A distinct layer of gravel mantled
by medium to fine sand and silt is the characteristic depositional pattern in the older alluvial environment; and the proportion of clay is very small in these deposits. Equal amounts of fine sand, silt and clay are associated with the sediment deposits in the rocky/gravelly piedmonts. These sediments also contain stone chips. Sediment samples were obtained from fresh cuts in the beds during May-June 1993, when the reservoirs were dry. The annual average depth of deposition was calculated from 4 to 6 depth measurements in the bed of the reservoir between two successive marker layers. This value multiplied by the area of the reservoir provides an estimate of the total volume of sediment deposited each year. The annual specific sediment yield was obtained by dividing the total volume of sediment deposited per year by the drainage basin area. Measurements of drainage basin area and slope were taken from 1:50000 scale topographic maps.

In the zone with an integrated stream network (zone III), information on the spatial variation of stream discharge and sediment yield has been obtained from 34 gauging stations which are located on various tributaries of the Luni River. Hourly stage heights were observed at each station during periods of flow and discharge has been calculated by the slope-area method, with values for the roughness coefficient of these sand bed channels taken from Vangani & Kalla (1985). The initial water sample is taken at the onset of flow, and subsequent samples are collected at irregular intervals and with significant changes in the discharge until the flow ceases. The samples were collected using a US DH-48 depth integrating suspended sediment wading type hand sampler, employing the equal transit rate method as recommended by Jones (1981) for arid regions. The samples thus collected were transported to the laboratory and subjected to standard concentration analysis by filtration and evaporation. The resulting data, together with recorded runoff rates, provided a reasonably accurate representation of the variation of sediment concentration during each flow event, as well as permitting the computation of sediment yield. These data were collected for 16 years over the period 1979-1994. As with the effective rainfall distribution, the largest number of events is found in the smallest sediment yield class of 0-100 t km²; thus providing a positively skewed unmoral frequency distribution (Sharma et al., 1994). Chang & Stow (1988) observed that catastrophic flood events caused the highest sediment loss from drainage basins in the arid zone. Thus, while sediment production occurs more generally in the drainage basin, significant sediment delivery is limited to major flood flows. The relationship between sediment yield and effective rainfall is depicted in Fig. 5.4. Wide variations in the magnitude of annual sediment yield were observed among the various physiographic regions encountered in the Indian arid zone (Table 5.2).
The older alluvial plain has the highest sediment yield, while the younger alluvial plain has the lowest. The sediment yields from the rocky/gravelly piedmont, dune complex and sandy plain areas lie between these two extremes. Except for the higher sediment yields from the older alluvial plain and the rocky/gravelly piedmont, the annual sediment yields from the other physiographic regions are in agreement with the mean rates of 2.6, 4.0 and 4.6 m$^3$ ha$^{-1}$ year$^{-1}$ reported from the arid regions of Australia, Tanzania and USA, respectively (Jones, 1981), under the similar rainfall conditions.

**Table No 5.2 Annual sediment yields in the Indian arid zone**

<table>
<thead>
<tr>
<th>Physiographic region</th>
<th>Average sediment yield (m$^3$ ha$^{-1}$ year$^{-1}$)</th>
<th>No. of observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sandy plain</td>
<td>3.4</td>
<td>36</td>
</tr>
<tr>
<td>Dune complex</td>
<td>4.8</td>
<td>18</td>
</tr>
<tr>
<td>Younger alluvial Plain</td>
<td>2.7</td>
<td>30</td>
</tr>
<tr>
<td>Older alluvial Plain</td>
<td>18.4</td>
<td>5</td>
</tr>
<tr>
<td>Rocky /gravelly piedmont</td>
<td>14.3</td>
<td>11</td>
</tr>
</tbody>
</table>

Fig No: 5.5 Mean annual sediment yield as a function of (a) mean annual rainfall, and (b) drainage basin slope for the indicated lithogies

Sediment yield is also a function of basin lithology together with the drainage basin slope, and the amount and intensity of rainfall. It can be seen from Fig. 5.5 that Sediment yields are highest from the sandstone drainage basins, (26.1 m$^3$ ha$^{-1}$ year$^{-1}$) followed by the phyllite (22.7 m$^3$ ha$^{-1}$ year$^{-1}$), older alluvium (14.8 m$^3$ ha$^{-1}$ year$^{-1}$), limestone (12.0 m$^3$ ha$^{-1}$ year$^{-1}$), quartzite (8.4 m$^3$ ha$^{-1}$ year$^{-1}$), blown sand (5.8 m$^3$ ha$^{-1}$ year$^{-1}$), shale (2.0 m$^3$ ha$^{-1}$ year$^{-1}$) and the younger alluvium (1.5 m$^3$ ha$^{-1}$ year$^{-1}$). However, this trend is slightly changed when the relationship between sediment yield and basin slope is plotted (Fig. 3(b)). In this case sediment yield follows the order: sandstone (25.9 m$^3$ ha$^{-1}$ year$^{-1}$) > phyllite (22.7 m$^3$ ha$^{-1}$ year$^{-1}$) > limestone (18.1 m$^3$ ha$^{-1}$ year$^{-1}$) > older alluvium (14.9 m$^3$ ha$^{-1}$ year$^{-1}$) > quartzite (14.2 m$^3$ ha$^{-1}$ year$^{-1}$) > younger alluvium (4.4 m$^3$ ha$^{-1}$ year$^{-1}$) > blown sand (4.1 m$^3$ ha$^{-1}$ year$^{-1}$) > shale (2.5 m$^3$ ha$^{-1}$ year$^{-1}$). For a single lithologie unit there is a general increase in sediment yield with both annual rainfall and drainage basin slope. The variations of sediment yield with rainfall and drainage basin slope are due to the nature of the rock. The sandstone outcrops in this region are composed of medium to fine sand with intercalated beds of grit or gravels; these outcrops generate the highest sediment yield in
comparison to shale which is more resistant, and in consequence loses the least sediment. The phyllite is composed of medium to coarse grains with uniform structure and loses less sediment than the sandstone. The limestone formations are fine, compact, hard and cherty with fractured and weathered upper layers and, thus, still produce less sediment than the quartzite which is medium to coarse grained. When sediment yields are plotted against the runoff generated in during individual events, a general increase in sediment yield with runoff can be seen. The higher runoff is associated with greater kinetic energy for erosion and transport of the eroded sediment. There are striking differences between the various events however, in the rate at which sediment yield increases with runoff.

**Fig No. 5.6 The relationship between sediment yield and runoff for a sequence of storm events**

Total Catchment area of Banas & Lapli River (Proposed Lease Area) 444.14 Sq. km. Sediment quantity of sand in the proposed area has been estimated by case study by K.D.Sharma, (CAZRI,Jodhpur).The finally we have concluded that the adequate quantity of sand will be replenishment naturally during monsoon period.

### 5.1 ENVIRONMENTAL IMPACT ASSESSMENT

The environmental parameters likely to be affected by mining are related to many factors, i.e. physical, social, economic, agriculture and aesthetic. Opencast mining involves extraction of River Sand along with other operations, viz. traffic network, and other vehicular movements. All the operations can disturb environment of the area in various ways, such as removal of mass, change of landscape, displacement of human settlement, flora and fauna of the area, surface drainage, and change in air, water and soil quality. While for purpose of development and economic upliftment of people, there is need for establishment of industries and mining, but these have to be environmental friendly. Therefore, it is essential to assess the impacts of mining on different environmental parameters, before starting the mining operations, so that abatement measures could be planned in advance for eco-friendly mining in the area. The likely impacts on different environmental parameters due to this mining project are discussed below.

The river sand mining activities cause environmental problems such as degradation of land, deteriorating air, water and soil quality, affecting the biological and socio-economic environment of the area.
5.2 IMPACT ON AIR QUALITY & MITIGATION MEASURES

The mining activities will be confined to the river bed, to extract soft sediments, without drilling & blasting, by semi-mechanized method. The activities in the regular operation can be broadly classified into excavation, loading and transport. As the proposed activity is only a extraction and sand normally having moisture does not have much impact on the air environment. The generation of dust will be negligible and the air quality will be marginally affected. However, control measures like water sprinkling on haul road are required to reduce the dust level and keep it within permissible limit. The gaseous pollutants (SO$_2$, NO$_2$ & CO) are anticipated by transport vehicles. However, the impacts due to the various activities during operational phase of the proposed sand mining project are given hereunder.

### Table 5.1 Various activities during operational phase of the proposed sand mining project

<table>
<thead>
<tr>
<th>S. No</th>
<th>Activity</th>
<th>Environmental Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mining</td>
<td>Emission of fugitive dust</td>
</tr>
<tr>
<td>2</td>
<td>Handling of Mineral (Sand)</td>
<td>Emission of fugitive dust</td>
</tr>
<tr>
<td>3</td>
<td>Transportation</td>
<td>Emission of fugitive dust Vehicular exhaust Emission (SO$_2$, NO$_2$, CO)</td>
</tr>
</tbody>
</table>

5.2.1 Impacts of the Sand Excavation

Daily, around 1000 tonne of sand will be excavated. Excavation is proposed to carry out by Backhoe. During the excavation time, the sand may be discharged in to air environment. However, as the area experiences calm winds during most of the times (Annual Mean Wind Velocity is < 5 km/h) the displacement of sand by air will be very insignificant. However, even such small quantities also need to be addressed in the project.

5.2.2 Impacts of the Sand loading in to trucks

Daily around 1000 tone sand will be loaded in to the trucks for transportation to the nearby areas. Loading of sand in to the trucks may likely to release particulate matter.

5.2.3 Sand Transportation

It is envisaged that about 50 trucks will transport about 1000 tonne of sand to the nearby areas. The transportation is done on road by trucks with a capacity of 20 Ton. Thus, the transportation process also contributes to vehicular emissions like SO$_2$, NO$_2$, CO.

5.2.4 Mitigation Measures for Air Pollution

In the sand mine, air pollution is caused mainly due to dust generation added with gaseous emission from mining activities like loading & transport etc. The gaseous pollutants (SO$_2$, NO$_2$, & CO) are anticipated by transportation vehicles.

**A. Dust Pollution**

One of the main pollutants in air will be particulate matter (PM), which will be generated during various activities of mining such as extraction of sand, and movement of vehicles. Following measures is been taken to minimize air pollution.

- Haulage road will be adequately sprayed with water by water sprinkler.
- The haul roads in the area will be made compact. Both sides of the haul roads will be planted with trees to arrest air borne dust.
- Green belt/plantation will be developed all along the haul roads and other places to arrest dust.
• Dust mask/Face mask will be provided to all employees working in the likely dusty areas.
• Proper maintenance of vehicles is been done, which minimize the pollutants.
• Ambient Air Quality Monitoring is been conducted on regular basis to assess the quality of ambient air as per the EC conditions and submitted to respective authorities.
• Proper tuning of vehicles to keep the gas emissions under check.

5.2.5 Air Quality Impact Predictions (AQIP)
The air quality in the mining areas depends on the nature and concentration of emissions and meteorological conditions. The major sources of air pollution due to the mine is dust generation due to excavation, loading and transportation of mineral, wind erosion of exposed material. Dust emissions from these operations mainly depend on moisture content of the sand and type of control measure adopted.

In this study, United States Environmental Protection Agency (USEPA – 42 series) approved mathematical equations have been used to predict concentrations for different operations in mining including the mineral transportation. The major sources for the Fugitive dust emissions from the proposed sand mining project include:

1. Sand excavation
2. Sand Loading on to trucks
3. Sand transportation to designated sites/market

Details of Source & Emissions
1. Area Source Emission
   Air pollution i.e. fugitive & dust emission will be generated due to excavation and handling of sand.

2. Line Source Emission
   Pollution due to vehicular movement is main source of line source emissions in mining activities. Surface conditions of the roads and the fuel consumption of the vehicles remains on the worst side due to which these emissions rate remains higher as the vehicular density increases. The major sources of line emissions during mining activities are the vehicular exhausts and dust due vehicle movement. The major emissions from this source are carbon monoxide, nitrogen oxide and Sulphur dioxide etc.

Air quality modeling was done using line source model as published by USEPA “Workbook of Dispersion Modeling” by Turner, for transportation though roads and the empirical emission factor equations from USEPA. Emission factors to be used in Line source Dispersion equation is adopted from formula as given below:

\[ E = k \times (1.7) \times (s/12) \times (S/48) \times (W/2.7)^{0.7} \times (w/4)^{0.5} \times (365-p/365) \text{ kg/VKT} \]

Where
E = Emission Rate (kg/VKT)
k = Particle size multiplier = (0.36)
s = Silt Content of the Road surface material (%) = 12%
S = Mean Vehicle Speed (km/hr) = 20 km/hr
W = Mean Vehicle Weight (tonnes) = 20 tonne
w = Mean number of wheels = 8
p = Number of days with at least 0.254 mm of precipitation per year = 20
f = frequency of Vehicle movement in no per hour = 6 vehicles / hour
Concentration of the fugitive dust was calculated using the empirical equations for unpaved roads published by USEPA- AP42.

**A. Area source emission – Sand Excavation**

<table>
<thead>
<tr>
<th>Particulars</th>
<th>PM$_{10}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production capacity, Tonne per Annum</td>
<td>2,81,000</td>
</tr>
<tr>
<td>Production capacity, Tonne per Day</td>
<td>1000</td>
</tr>
<tr>
<td>Operational Hours per year</td>
<td>2240</td>
</tr>
<tr>
<td>USEPA Emission Equation in lb/ton</td>
<td>0.75[18.6 (s)$^{1.5}$ / (M)$^{1.4}$ ]</td>
</tr>
<tr>
<td>Emission of dust, g/sec</td>
<td>0.006414</td>
</tr>
<tr>
<td>Area of influence, m$^2$</td>
<td>10000 sqm</td>
</tr>
<tr>
<td>Uncontrolled Emission Rate, G/S/M$^2$</td>
<td>0.0000064</td>
</tr>
</tbody>
</table>

**B. Haulage Emissions (unpaved) – Transport of sand**

<table>
<thead>
<tr>
<th>Particulars</th>
<th>PM$_{10}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production capacity, Tonne per Annum</td>
<td>2,81,000</td>
</tr>
<tr>
<td>Production capacity, Tonne per Day</td>
<td>1000</td>
</tr>
<tr>
<td>Operational Hours per day</td>
<td>8</td>
</tr>
<tr>
<td>Capacity of each truck</td>
<td>20 Ton</td>
</tr>
<tr>
<td>Total no. of trucks per day</td>
<td>50</td>
</tr>
<tr>
<td>Total no. of trucks per hour</td>
<td>6</td>
</tr>
<tr>
<td>Lead Length per trip,km</td>
<td>50 km(Two way)</td>
</tr>
<tr>
<td>USEPA Emission Equation in lb/VMT (Pounds per vehicle miles traveled)</td>
<td>$(k) \times [(s/12)^{0.9}] \times [(W/3)^{0.45}] /((365-p)/365)$</td>
</tr>
<tr>
<td>Emission, kg/VKmT (kilogram per vehicle kilometer traveled)</td>
<td>0.796 lb/VMT</td>
</tr>
<tr>
<td>Area of influence, m$^2$</td>
<td>10,000</td>
</tr>
<tr>
<td>Uncontrolled Emission Rate, G/S/M$^2$</td>
<td>0.000022</td>
</tr>
</tbody>
</table>

Emission factor computed based on silt content of 12 % and moisture content of 10%.

For each, a brief description characterizing the source and the general methodology used to estimate emission rates are provided. Based on USEPA emission factors, the possible emissions from different mining activities such as excavation, loading and transportation has been computed. The summary of emissions for peak rated production capacity of 100% from different mining activities calculated.

A substantial portion of these emissions may consist of heavy particles that settle out within the mining site. Considering the silt content of the mining sand (12%) with a moisture content (10%) 5.2.6 Air Quality Modeling

In order to predict the Particulate emissions, AERMOD 8.2 View Model was used to predict changes in air quality i.e. maximum Ground Level Concentration (GLC’s) of particulate matter, due to the
various sand mining activities of the proposed project. The model uses the steady state Gaussian plume equation for continuous source. For convenience, 10000 m X 10000 m square block by keeping project centre coordinates as (0.000, 0.000) has been selected for modeling so as to include all the air quality baseline monitoring stations in the block. The GLC’s were predicted for Environment Management Plan with 90% of pollution control for peak production capacity. The inputs required for the model is:

- Hourly meteorological data
- Source data
- Receptor data
- Emission rate
- Terrain data

**Figure 5.1 Isopleths showing predicted incremental GLC’s of PM$_{10}$**

### 5.2.7 Results and Conclusion

The ground level concentrations are computed for 24-hr average. The maximum ground level concentrations of PM10, from the different mining activities for study period with EMP are given in Table 5.3

**Table No: 5.2 Predicted 24-Hour Short Term Incremental Concentrations**

<table>
<thead>
<tr>
<th>Pollutants</th>
<th>Incremental Concentration (g/m$^3$)</th>
<th>Distance (m)</th>
<th>Direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM$_{10}$</td>
<td>1.9</td>
<td>Within 500</td>
<td>Towards NE</td>
</tr>
</tbody>
</table>

The cumulative concentration (baseline + incremental) after implementation of the project are tabulated below in Table- 5.4. The maximum GLCs after implementation of the project are likely to
be within the prescribed NAAQ standards.

<table>
<thead>
<tr>
<th>Sampling Location</th>
<th>Monitoring Maximum concentration in $\mu$g/m$^3$</th>
<th>Predicted incremental Maximum concentration in $\mu$g/m$^3$</th>
<th>Resultant Maximum concentration in $\mu$g/m$^3$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mining site</td>
<td>81.1</td>
<td>1.9</td>
<td>83.10</td>
</tr>
</tbody>
</table>

### 5.3 IMPACT OF NOISE & MITIGATION MEASURES

#### 5.3.1 Impact of Noise on Working Environment

Noise will be generated by movement of vehicles used for transportation and machines used for excavation. Noise environment in this project will be affected only by the equipment at the site and vehicular transportation. Since mining is done semi-mechanically, slight increase in noise levels will be expected. Noise pollution can cause significant impact on the environment and subsequently on the humans. Baseline Noise levels are observed to be well within the limits in the monitored villages. However, after applying the mitigation measures noise pollution will be reduced further.

#### 5.3.2 Anticipated Impacts

The proposed sand mining project consists of three major activities as brought out earlier. The following table indicates the impacts due to various activities on Noise Environment:

<table>
<thead>
<tr>
<th>S. No</th>
<th>Activity</th>
<th>Environmental Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sand Excavation</td>
<td>Slight increase in Noise Levels</td>
</tr>
<tr>
<td>2</td>
<td>Sand Loading</td>
<td>Slight increase in Noise Levels</td>
</tr>
<tr>
<td>3</td>
<td>Sand Transportation</td>
<td>Slight increase in Noise Levels</td>
</tr>
</tbody>
</table>

#### 5.3.3 Mitigation Measures

- Since the noise generating is only through mechanical equipment and movement of vehicles, strict compliance to periodical maintenance the vehicle conditions will be insisted.
- No working will be carried out in the night hours.
- Greenbelt and plantation on road side will help in reduce noise level.

#### 5.3.4 Noise Abatement and Control

The following control measures will be adopted to keep the ambient noise levels well below the limits:

- In order to reduce the effect of noise pollution, ear plugs /earmuffs will be provided to all employees.
- Selections of machinery have been done which generate less noise.
- Confining the noise generating sources.
- Periodical noise level monitoring will be carried out.
- Maintenance of vehicles
- Prepare haulage road with slope ratio of 1:10.
- Day time mining
- Load one by one truck

### 5.4 IMPACT ON WATER ENVIRONMENT & MITIGATION MEASURES

#### 5.4.1 Impact on Surface Water
Surface drainage will not be affected by mining activities, as excavation of sand will be done in main river bed.

5.4.2 Rain Water Harvesting
The proposed mine is situated on the river bed of the Banas and Lapli River. So, no rain water harvesting structure is proposed.

5.5 BIOLOGICAL ENVIRONMENT
No adverse impact is envisaged in the existing flora, as there will be no deforestation by river sand mining operation.

The dust is the only major pollutant which will be generated from different activities of river sand mining. The effect of particulate matter on vegetation is in the form of incrustation, plugging of stomata, loss of chlorophyll and reduction of photosynthesis process. Disturbance in plant metabolism due to deposition of dust particles on foliar surfaces leads to reduction in plant growth. The atmospheric concentrations normally do not reach a level sufficient to induce acute injury.

5.5.1 Measures for Minimizing Impact on Flora
The green belt in the lease area will to be designed taking into consideration the availability of area as the efficacy of green belt in pollution control mainly depends on width of the green belt, distance from pollution sources, site of the habitat from working place and tree height & density. While considering the above aspects due care will be taken for selecting the suitable characteristics plant species as those fast growing and evergreen trees, trees with large leaf area, locally suitable plant species, those resistant to specific pollutant and those which would maintain the regional ecological balance.

5.5.2 Impact on Fauna
The mining lease area is in non-forest land where presence of fauna is very rare. No endangered species of fauna is found in and around lease area. As such, there will be no adverse impact of the mining activity on fauna around the mining lease area.

5.5.3 Measures for Minimizing Impact on Fauna
Following measures will be adopted to minimize the impact of mining on faunal environment of the area.

- Measures is been taken to curb pollution due to air, water, land & noise environment.
- Greenery developed around mining lease area helps in creating habitats for local faunal species and to create better environment for various fauna.
- The tree plantation is been developed and animal food value in buffer area and the core area not under active mining as well as other neighboring areas have been developed which have created favorable conditions for wildlife.
- Creating and developing awareness for nature and wildlife in the adjoining villages.

5.5.4 Impact on Aquatic Ecology
The proposed mining activity is on the Banas and Lapli River bed. Since the mining activity is on the bed away from the river flow, therefore there shall be no impact on the aquatic flora and fauna.

5.6 IMPACT ON SOIL AND LAND USE PATTERN & MITIGATION MEASURES

5.6.1 Impact of change of land use
The lease area is 773.2797 Hectare. The mine lease area belongs to Govt. land. In the ML area, mining activity will be confined to the mineralized zone consist to river bed only, hence there will be no changes in land use of the area. Further in the river bad only sand will be excavates, which is available on surface of river bad, so there will be no loss of top soil.
5.7 SOCIO- ECONOMIC ENVIRONMENT

5.7.1 ANTICIPATED IMPACTS

The project activities will not have any adverse impacts on any of the common property resources of the village communities, as the sand mine lease area is not being used for any purpose by any section of the society in this region. There is no R&R & land acquisition involvement in this project. There is no impact of mining on local residents of the area as habitation is away from the applied lease area. The maximum persons will be employed form nearby villages. There is no source of employment in nearby area in this region and thus the employment will develop by the proposed mining activity in nearby area. The applicant after become lessee will help in maintenance of village kaccha roads with request of local Panchyat Samiti. The lessee will provide maximum assistant to local body on their request. The lessee will develop the plantation along the roads. The lessee will contribute some fund from the income and the fund will use only for the social development of the people in the field of Education and Medical.

Due to differences in geographical locations and climatic conditions, views of respondents and indeed, actual ecological effects of river sand mining, also differed. Results from respondents showed that the single most important effect of river sand mining area is change in river depth and possible change in river bank. Agriculture area located on the river bank may get land erosion problem. This was particularly because agriculture is the predominant economic activity along the river area. Agricultural activities are often undertaken in the rainy season, and during the dry season farmers spend their time in land preparation.

Another significant effect of river sand mining is the abandoned pits serving as a source of breeding grounds for mosquitoes for example, and the resultant spread of malaria and other related diseases. During rainy seasons, the abandoned pits collect water and as a result attract malaria parasites resulting in infection of community people. Other diseases such as cholera, dysentery and diarrhea, among others, are associated with the mining activities.

The important finding gathered was the occurrence of mining activities along rivers and other water bodies. Mining activities along these rivers can retard free flow of the water course. Such direct in-stream mining can alter the channel geometry and bed elevation and may involve extensive clearing, diversion of flow, stockpiling of sediment, and excavation of deep pits. This can also result in significant distortion of the channel morphology, which often causes silting as a result of erosion of the banks and consequent flooding, which may worsen especially during high precipitation. Machinery which is used to extract sand sometimes disturbs the vegetation and further exposes the area to erosion and harsh weather conditions. This can as well cause loss of the protection provided by soil as it filters out pollutants and can further affect aquatic life in such riverine areas.

5.7.2 Mitigation Measures

The following mitigation measures will be taken to solve the problems/points raised by local people during field survey:

- To protect the agricultural area on the river bank an utmost care will be taken while working in such areas where agriculture is practiced. Agricultural fields will be protected by river bolder where ever the possibility of river erosion will be felt.
- To avoid the possibility of spread of malaria due to stagnant water, no pit will be created due to excavation of river sand. However if water is accumulated after the rainy season anti-mosquito treatment like fogging, spread of kerosene etc. will be done in the areas.
A proper road and transportation network will be developed for movement of vehicle and machinery. No major change in the vegetative cover is anticipated. However the development of greenbelt has already been suggested.

To check the possible change in the river bank, 10 meter distance from both side of river will be kept untouched from exaction of sand and a proper slope will be maintained to keep the river bed smooth so that water flow may not be disturbed.

The geometry of river will not be changed in any case, but if there are any weak spots where that possibility of change of river channel is visible in case of high rainfall, appropriate measures will be taken with the help of hydro-geo-morphologist.

5.7.3 Social and ecological effects of river sand mining

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Another effect of mining is modification of the recharge area for groundwater by changing the land surface of river bed, such as forming depressions so that water no longer flows along original pathways. Such changes may increase or decrease rainwater recharge to groundwater. Shorter flow paths may increase susceptibility to contamination while re-directed flow paths may deplete total recharge of the aquifer.

The project will also provide impetus to industrialization of the area. Where transfer of boulders into bajri is necessary crushing units will come up. It is expected that intending entrepreneurs will venture to set up micro and small scale units in the near future making the area a mixed society, dependent on industry, trade and business. At present agriculture is the main occupation of the people as more than half of the population depends on it. With the implementation of the proposed mining project the occupational pattern of the people in the
area will change making more people engaged in industrial and business activities rather in agriculture. Thus there will be a gradual shifting of population from agriculture to mining and industry. Further, the mining and industrial activities in the area may lead to rapid increase in population and thereby urbanization.

5.7.4 Impact on Human Settlement
- As the area of operation is in river bed only, hence no habitants in the core zone or buffer zone will be affected and no adverse impact is anticipated to human settlement.
- Review of secondary data, such as District Census Statistical Handbooks-2011 and the records of National Informatics Center data, for the parameters of demography, occupational structure of people within the general study area of 10 km radius around the project site.

5.8 IMPACT ON LOCAL TRANSPORT/INFRASTRUCTURE
The traffic density on the surrounding roads of the mine site is very low and capable of handling of increased traffic. In the proposed mining, the production capacity is less and for transporting of excavated material, less number of vehicles will be required. Hence, the local transport / infrastructure facilities will be capable of handling the increased load due to mining activities.

The total extraction of sand will be 1000 TPD. The loading capacity of a truck is 20 ton hence 50 trucks will be used par day. So there will be no impact on local transport infrastructure due to the project.

5.9 IMPACT ON CIVIC AMENITIES
The impact of mining on the civic amenities will be substantial after the increase production capacity of the project. With improved transportation facilities there is always a scope for development. The communications facilities have increased and developed in the area and will also further develop in near future.

5.11 MINE CLOSURE
Mine closure plan is the most important environmental requirement in mineral mining projects. The mine closure plan should cover technical, environmental, social, legal and financial aspects dealing with progressive and post closure activities. The primary aim is to ensure that the following broad objectives along with the abandonment of the mine can be successfully achieved:
- To minimize environmental damage
- To conserve valuable attributes and aesthetics
- To overcome adverse socio-economic impacts
- To create a productive and sustainable after use for the site, acceptable to mine owners, regulatory agencies and the public
- To protect public health and safety of surrounding habitation.

5.11.1 Mine closure criteria
The criterion involved in mine closure is defined in relation to following key issues.
- Compatibility with agreed post –mining land use
- Physical stability
- Low risk to biota
- Physical stability
- Re-vegetation and other improvements

*****
CHAPTER–6
ENVIRONMENTAL MONITORING PROGRAMME

6.1 GENERAL
The regular monitoring of environmental parameters is of immense importance to assess the status of environment during project operations. With the knowledge of baseline conditions, the monitoring programme will serve as an indicator for any deterioration in environmental conditions due to operation of the project, to enable taking up suitable mitigation steps in time to safeguard the environment. Monitoring is as important as that of control of pollution since the efficiency of control measures can only be determined by monitoring.

6.2 SCOPE OF ENVIRONMENTAL MONITORING PROGRAM
Environmental Monitoring Program includes periodic analysis of air, soil, noise and water, samples. Environmental monitoring will be conducted on regular basis to assess the pollution level in the mining lease area as well in the surrounding areas. Therefore, regular monitoring program of the environmental parameters is essential to take into account the changes in the environment.

The objectives of monitoring are
- To identify the status of pollution within the ML area.
- Verify effectiveness of planning decisions
- Measure effectiveness of operational procedures
- Confirm statutory and corporate compliance
- Identify unexpected change
- River sand Replenishment Observation

6.3 POST PROJECT MONITORING PLAN

6.3.1 AIR QUALITY MONITORING
Air quality monitoring is essential for evaluation of the effectiveness of abatement programmes and to develop appropriate control measures. The proponent will monitor fugitive dust emissions at locations of nearest human habitations and other public amenities located nearest to sources of dust generation, in and around the proposed sand mining project at a frequency of once in a fortnight or any other frequency as stipulated by MoEF and take appropriate air pollution control measures in order to ensure that the concentration of PM$_{10}$, SO$_2$ and NO$_2$ are within the limits. The monitoring records will be submitted to MoEF regularly.

<table>
<thead>
<tr>
<th>S. No</th>
<th>Potential Impact</th>
<th>Description of Parameters</th>
<th>Parameters for monitoring</th>
<th>Frequency of monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ambient Air</td>
<td>Air Quality: a) In the vicinity of the mine b) In the vicinity of the transportation Network c) Dust suppression on roads d) Scraping/ bulldozing of road to shift accumulated dust to the sides.</td>
<td>PM$_{10}$, SO$_2$, NO$_2$ and CO</td>
<td>As per CPCB/ RSPCB requirement</td>
</tr>
</tbody>
</table>

Vehicle trips to be minimized Vehicle logs Daily records
<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Ambient Noise Level</td>
<td>Equipment and machinery noise levels, &amp; occupational exposures</td>
<td>Leq (night) Leq (day)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Generation of vehicular noise</td>
<td>Maintain records of vehicles</td>
</tr>
<tr>
<td>3</td>
<td>Water quality and water levels</td>
<td>Samples from the nearby surface water bodies and ground water samples from the nearby villages</td>
<td>Physico-chemical and instrumental methods of analysis. For the parameters prescribed in the consent conditions of state pollution Control Board.</td>
</tr>
<tr>
<td>4</td>
<td>Maintenance of Green Belt</td>
<td>Vegetation, greenbelt/ green cover development</td>
<td>Tree Plantation</td>
</tr>
<tr>
<td>5</td>
<td>Soil quality</td>
<td>In buffer zone</td>
<td>Physico- chemical parameters</td>
</tr>
<tr>
<td>6</td>
<td>Health Surveillance</td>
<td>Employees</td>
<td>All relevant parameters including HIV</td>
</tr>
<tr>
<td>7</td>
<td>River Sand Replenishment</td>
<td>Replenishment</td>
<td>River Sand Replenishment</td>
</tr>
</tbody>
</table>

### 6.3.1.1 PARAMETERS
As per MoEF guidelines, the concentration of Particulate Matter (PM$_{10}$), Sulphur dioxide (SO$_2$), CO and Nitrogen Dioxide (NO$_2$) will be monitored in upwind, downwind and crosswind direction and also covering all sensitive receptors, along with adequate meteorological measurement for proper interpretation of data.

### 6.3.1.2 METHODOLOGY
Respirable dust sampler with gaseous sampling attachment will be used for monitoring of air quality for parameters viz., PM$_{10}$, SO$_2$ and NO$_2$ with a sampling frequency of 24 hours duration. Sampling and analysis will be carried out as per IS- 5182:1999 for measurement of air Pollution. PM$_{10}$ will be analyzed gravimetrically, SO$_2$ will be analyzed by improved west and Gaeke method and NO$_2$ will be analyzed as per Jacob & Hochheiser Modified (Na-Aresnite) Method.

The National Ambient Air Quality Standards, MoEF Notification: GSR 826 (E), November 16th, 2009 is made applicable to sand mining project.

### 6.3.2 WATER QUALITY MONITORING
Water quality monitoring involves periodical assessment of quality of ground water and surface water near the river sand mining project.

All the parameters as given in Part - A of General Standards for Discharge of Environmental Pollutants, GSR 801 (E) Environment (Protection) Rules, 1986 prescribed by CPCB will be analyzed.
for all the effluents for assessing the overall quality of effluents. Surface water samples will be analyzed for all the parameters as per CPCB Guidelines and ground water samples will be analyzed for all the parameters as per IS-10500.

6.3.2.1 METHODOLOGY
The sample collection, procedures for sample preservation and methods of analysis are followed as per Standard Methods for examination of Water and Waste water analysis published by American Public Health Association (APHA).

6.3.2.2 FREQUENCY OF MONITORING
Monitoring of water samples will be done at a frequency of once in each season. The following standards will be followed for complete analysis of water samples:
Surface water: As per CPCB Guidelines
Ground water: BIS-10500:2012

6.3.3 NOISE LEVEL MONITORING
Noise level monitoring will be done for achieving the following objectives:
I. To compare sound levels with the values specified in noise regulations
II. To determine the need and extent of noise control of various noise generating sources
III. Correlation of noise levels with community response to noise levels.
Noise level monitoring will be done at the work zone to assess the occupational noise exposure levels. Noise levels will also be monitored at the noise generating sources like sand handling arrangements, vehicle maintenance workshop and also nearby villages for studying the impact due to higher noise levels for taking necessary control measures at the source.

6.3.3.1 PARAMETERS
The noise level recordings will be measured in dB (A) Leq values, where dB (A) denotes the time weighted average of the level of sound in decibels on scale A, which is relatable to human hearing.

6.3.3.2 FREQUENCY OF MONITORING
Monitoring frequency for noise levels will be once in a fortnight. MoEF has stipulated that noise levels have to be monitored between 6.00 AM to 10.00 PM for day time and 10.00 PM to 6.00 AM for night time.

6.3.4 GREEN BELT DEVELOPMENT
Vegetation development is proposed along the bank of river and road sides of approach roads. While selecting plant species preference will be given for planting native species of the area and shall have soil binding capacity. Proponent will supply saplings to surrounding villagers for green belt development in their villages and encourage the plantation by means of social forestry.

6.4 RIVER BED REPLENISHMENT
In River sand replenishment study is very important. For ecological & environmental sustainable balance there must be a balance between river sand mining and replenishment. The imbalance may cause following measure threatening to the eco- system of the area/region, especially in arid and semi-arid region of Rajasthan.
Detail study also done for estimation of replenishment of river sand by different technique and concluded that the adequate quantity of sand will replenished naturally every monsoon period.

6.5 ENVIRONMENTAL MONITORING CELL
Apart from having an Environmental Management Plan, it is also necessary to have a permanent organizational set up charged with the task of ensuring its effective implementation of mitigation measures and to conduct environmental monitoring. In this effect, project proponent will assign
responsibilities to officers from various disciplines to co-ordinate the activities concerned with management and implementation of environment control measures. An Organ gram of Environment management is shown in figure No 6.1. Basically, this department undertakes the monitoring of environmental pollution level by measuring, ambient air quality, water and effluent quality, Noise level, etc., either departmentally or appointing external agency whenever required. The Environmental and Safety department will also looking after for preparation of environment statement, carrying out environment audit, preparation of Consent to establish & Consent to operate. Environmental monitoring cell will be established for monitoring of important and crucial environmental parameters which are of immense importance to assess the status of environment during sand mine operation.

In order to carry out the environmental monitoring, EMC will perform the following activities:

- EMC will oversee that environmental control measures are implemented as per approved action plan.
- Identify and record the constraints in respect of environmental planning and implementation.
- Systematically document and record keeping w.r.t environmental issues.
- Monitoring of plantation development.
- Environmental compliance to the regulatory authorities.
- Communication with the concerned departments on the environmental issues. Interact and liaison with State/ Central Government departments
- To monitor compliance of environmental regulations.
- Continual improvement in environmental performance.
- To follow proper documentation and monitoring procedures, for developing better environmental management systems at the mine.
- To keep up with regulatory requirements and arrange for the necessary certificates or consents viz., air and water.
- To conduct yearly environmental monitoring and submit the statement to RSPCB.

6.6 REPORTING SCHEDULES OF MONITORED DATA
The monitored data on air quality, water quality, soil quality and noise levels, will be periodically examined for taking necessary corrective measures. The monitored data will be submitted to Rajasthan State Pollution Control Board (RSPCB). The post-project data will be submitted in half-yearly monitoring reports to the same.
CHAPTER–7
ADDITIONAL STUDIES

7.1 PUBLIC CONSULTATION

As per the provisions of Environmental Impact Assessment Notification dated 14-09-2006 issued by Ministry of Environment and Forests, Govt. of India; and vide District Collector letter no. 40(7)(42)/सा.प्र. /पर्यावरण /जनसूची /11/891 dated 09.10.2014 & Regional office, Rajasthan State Pollution Control Board, Bhiwara letter no. राजस्थान प्रदेश प्रदेश /कृषि भूमि / भूमि /पी.एच. /3096 dated 16.10.2014, Public Hearing was conducted at 03.00 PM on 25.11.2014, in the premises of Panchayat Samiti Office: Khamnor, Tehsil: Nathdwara, District: Rajasamand under the Chairmanship of ADM (Administartion) Shri Govind Singh Ranawat, Rajsamand & Regional Officer Shri Mahaveer Mehta (RSPCB, Bhiwara) for Proposed River Sand Mining Project located at Revenue villages of Tehsil: Nathdwara, District: Rajsamand, Rajasthan. Advertisement for conducting public hearing was published on 19.10.2014 in “Hindustan Times” & “Dainik Bhaskar on 20.10.2014”. To start with the proceedings of Public Hearing Shri Mahaveer Mehta, Regional Officer, Rajasthan State Pollution Control Board, Bhiwara welcomed all the persons present and gave a brief introduction about the procedure and importance of Public Hearing being conducted under the EIA Notification, dated 14.09.2006 issued by Ministry of Environment & Forests, Government of India. Thereafter representative of Project consultant M/s Enviro Concept (I) Pvt. Ltd, Jaipur Shri Ghanshyam Das and Shri Ram Kishor Kumawat made a presentation and gave details of the project. 33 persons made their attendance in the public hearing and following issues were raised:-

Table No 7.1 Public Hearing proceedings & Action Plan

<table>
<thead>
<tr>
<th>S. NO.</th>
<th>NAME &amp; ADDRESS OF THE PERSON</th>
<th>ISSUES RAISED IN BRIEF</th>
<th>COMMENTS OF THE PROPOINENT</th>
<th>ACTION/BUDEGETARY PROVISION IF ANY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Harish Chand Shrimali Village: Balicha, Khamnor</td>
<td>He asked who will be starting this project Environment Department, Contractor or Administration. There is no plantation shall be carried out till date which 5% of royalty received for Environment. Who will be carried out plantation and monitoring and</td>
<td>Plantation of local species will be carried out along the road sides, in schools, on government land with the help of local administration and villagers under the programme of social forestry. Plantation will be carried out along the 7.5 meter of safety zone of River bed both side. Local species will be planted. Lease holder applied for Environmental clearance in MOEF &amp;CC. All the developmental works will be started after the clearance from MoEF by the lease</td>
<td>0.5 Lac per year for Medical Camps (eye camp, blood donation camp etc) under the Provision of CSR. Environmental Pollution Monitoring i.e Water, Air, Soil &amp; Noise etc :4.30 Lac Per Year</td>
</tr>
<tr>
<td>No.</td>
<td>Name</td>
<td>Question</td>
<td>Answer</td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>---------------</td>
<td>-------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Heera Singh</td>
<td>What are the benefits of villagers by this sand mining project? Will be</td>
<td>There is an economic and social development by any project in a village. There will be expenditure of Rs.4.60 lac under Corporate Social Responsibility (CSR) activity. Health camps will be organized for the villagers, proper facility of drinking water will be provided. Constructions of toilets in government and other schools. Employment will be provided to local villagers 4.60 Lac per Year under CSR Programme. About 23 persons will be employed directly.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Village Samala</td>
<td>cost free Bajri provided them for their house constructions?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

when will be started. It is said in the project that road will be made on river bank than it will be made on river bank or in nearby villages. It is also said that plantation will be carried out on river bank. How will be development of schools in nearby villages? This project is good for villagers and beneficial for workers but who will be observed this management? Camp will be organized for workers or villagers?

Environmental monitoring works i.e. Air, Water Soil; Noise will be carried out after the environmental clearance. Health camps will be organized for the villagers for the same 50,000 per year will be expenditure for the blood donation camp, eye camp etc. In mining and loading area dust masks will be provided to workers to prevent the air pollution related disease.
### Preference for Local Villagers

Preference will be given to local villagers. Apart of it indirect employment will be given to truck & Tractor drivers.

If any person required royalty free bajari for any construction work than it will be provide on written permission of administration and mining department. If any person wants royalty free Bajri for any construction works in village like; house, temple etc than it will be provided on written permission of Village Sarpanch, administration and mining department (Rajsmand) it will be provided. There is no any provision of royalty free Bajri if administration wants than provides.

| 3 | Jagdish Paliwal, Village Semakhera | He appraised this River sand mining project. New employment will be generated due to the construction activities. He expresses his happiness. | -- | -- |

D/FREIA/201503
7.2 RISK ASSESSMENT & DISASTER MANAGEMENT PLAN
The present project is a Sand mining project, which is relatively very low risk activity, being surface mining or open cast mining, compared to coal mining. The risks associated with the project are not hazardous, but if any, they are only accidents and incidents, associated with mining machinery or transportation activity. This part delineates the risks associated with the project and the prevention measures to avoid or minimize the risk.

7.2.1 RISK ASSESSMENT & DISASTER MANAGEMENT PLAN
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7.2.2 ACTIVITIES WITH POTENTIAL RISKS
None of the risks are of hazardous type, while accidents and incidents can be expected if adequate controls or safety systems are not adopted. The sand excavation and loading on to the trucks by Backhoe can have risks of accidents if human failure or errors are not taken care of. The Accidents, if any, may not be fatal, but are potential to cause temporary or permanent disabilities. Thus, the need for adequate safety at work places is needed. On the other hand, the manual activity of sand
mining and sand loading is not associated with accidents, however, some minor incidents like exhaustion, sun-strokes, or other health related incidents may take place, which can be avoided with adequate safety regulations and measures. Transportation of mined sand to the stowing sites is the activity associated with accidents on road and at the project site. However, with effective safety measures the accidents can be avoided and prevented.

7.2.3 SAFETY OF MACHINE USE AT MINING SITE
The major machinery that is used at mining site is only a Backhoe vehicle that can excavate sand and load on to the trucks. The area where Backhoe is operated will be manned by appropriate licensed and trained staff to ensure that the vehicle activity is performed as per the safety norms. The vehicle operating condition is ensured every day before the work is initiated, especially with regard to its hydraulic systems, mechanical conditions, and other operating systems. The movement of trucks for loading of sand shall be regulated by a trained inspector who shall be responsible for the safety of vehicle movement and prevention of accidents or incidents associated with the vehicular movement. The staff working with backhoe and on site shall be trained in first-aid and other safety measures, accident or incident prevention and reporting and communication mechanisms.

7.2.4 SAFETY MEASURES DURING WORKING AT SAND MINING SITE
Occupational safety and health is very closely related to productivity and good employer – employee relationship. Some of the measures proposed for occupational safety and health have been listed below:

- Safety measures will be implemented as per mine act 1952, MMR 1961 mines rules 1955.
- Protective equipment like dust mask, ear plugs/muffs and other equipments shall be provided for use by the work persons.
- Notices warning to prevent inadvertent entry of persons shall be displayed at all conspicuous places and in particular near mine entries.
- Danger signs shall be displayed near the excavations.
- Security guards will be posted.
- Provision of rest shelters for mine workers with amenities like resting, drinking water, and toilets facilities etc. will be provided by lessee.
- Rotation of workers, if necessary.
- First - Aid facilities in the mining area.
- Training of personnel to inculcate safety consciousness through slogans and posters.
- All workers will be subjected to medical examination as per mines rule 1955 both at times of appointment and at least once in five years. Medical camps will be organized for this activity. Insurance of all employees as per the rules will be carried out.
- Regular/periodical monitoring of mine environment to ensure the efficacy of various protective measures.

7.2.5 SAFETY MEASURES DURING SAND TRANSPORTATION
Sand transportation from the mining site to the market is a major activity that can have potential risks of road accidents. In order to prevent these, the following safety measures will be proposed:

- The vehicles will be maintained in good condition and checked thoroughly at least once a month by the competent person authorized for the purpose by the management.
- The vehicle drivers and associated staff will have appropriate licenses issued by the concerned authorities.
- All transportation within the main working should be carried out directly under the supervision and control of the management.
- The maximum permissible speed limit will be ensured.
To avoid danger while reversing the equipments/vehicles especially at the working place/loading points, stopper should be posted to properly guide reversing/spotting operating, otherwise no person should be there within 10 km radius of machine.

Avoid over-loading of tippers & trucks & consequent spillage on the roads.

**7.2.6 POSSIBLE RISKS DUE TO FAILURE OF WASTE DUMP & ITS CONTROL**

No waste dump will be created therefore the question of failure of waste dump does not exist.

**7.2.7 OTHER POSSIBLE MEASURES TO AVOID RISKS/DISASTER DUE TO RIVER BED MINING.**

- Unwanted material including mineral or spillage (if any) will not be stacked on the banks as it will hinder the flow of water in monsoon season.
- The minerals will be mined out in a uniform way so that the river flow/course will not get disturbed.
- 10 m offset will also be left against the banks to protect side collapse/scouring and riparian vegetation.

**7.3 OCCUPATIONAL HEALTH & SAFETY (OHS)**

Healthy and safe working conditions are among the first expectations for sustainability, i.e. the expectation that risks in mining will not deprive workers of their livelihoods or of their quality of life. Occupational injuries and ill-health have huge social and economic implications for individuals, their families and their communities. They also have an adverse impact on the economy of the society as a whole. Occupational accidents and health hazards can also affect public health and safety, and the environment. The effect on the health and safety of people costs the economy and impacts the environment. Efforts will be made to address occupational health and safety with broader social agenda for sustainable development. Hazards, which are associated with poor engineering design, contribute to increased safety risks. Although health risks can be avoided by implementing controls at source in the work environment, designing such controls for mining environment presents considerable challenges because dust and noise are generated by mining itself. A range of control measures that act together to reduce exposure to such risks is therefore necessary. These could include methods for minimizing dust levels by reducing dust generation and methods for dilution, suppression, capture, and containment. While significant uncertainties remain in controlling dust exposures and maintaining the effectiveness of control the use of appropriate personal protective equipment (PPE) is important. Occupational health and safety (OHS) is a cross-disciplinary area concerned with protecting the safety, health and welfare of people engaged in work or employment. The goal of all occupational health and safety programs is to foster a safe work environment. Excessive dust, noise and vibration are the chief health hazards for the miners. Some examples of such hazards are:

- Exposure to dust
- Noise exposure
- Vehicular movements
- Physical Hazards.

**Exposure to Dust**

- Exposure to fine particulates is associated with work in most of the dust-generating stages notably from sand handling, and transportation.
- Workers with long term exposure to fine particulate dust are at risk of pneumoconiosis, emphysema, bronchitis, and fibrosis.

**Methods to prevent and control exposure to dust include the following:**

- Control of dust through water spraying,
- Use of PPE, as appropriate (e.g. masks and respirators) to address residual exposures.
Pre-placement medical examination and periodical medical examination schedules
The fresh employees when taken are thoroughly medically examined under initial medical examination and thereafter during continuation of employment; the periodic medical examination is being done suggested by DGMS.

7.4 CORPORATE SOCIAL RESPONSIBILITY ACTIVITIES
Welfare Amenities
The surrounding villages will also be benefited from the proposed welfare amenities as listed below-

Table 7.2 Detail of CSR Activities

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Description</th>
<th>Amount Per Year (in lac)</th>
</tr>
</thead>
</table>
| 1      | Health check up camps for workers & Villagers  
▪ Medical Examination  
▪ Medical Camps i.e. Blood Donation, Eye Camp etc  
▪ Helping to govt. programs to vaccination / polio/ TB etc. | 0.5 |
| 2      | EHS Programme of the workers  
▪ Occupational health and Safety program me of the workers shall be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures if required | 0.5 |
| 3      | Insurance cover of workers & others Facilities  
a. Insurance  
b. Drinking water  
c. first aid box  
d. welfare facilities | 0.6 |
| 4      | Assistance to local schools/ Hospitals/ Anganbadies etc.  
▪ Merit cum need Scholarships to the poor family children's  
▪ Contribution to vocational training to needy people  
▪ Free distribution of books & uniforms to the students. | 1.0 |
| 5      | Sanitations and Drinking water facilities  
Construction of toilets & other facilities for Public utilization  
Helping and contributing to drinking water supply | 1.0 |
| 6      | Skilled Development Programme  
Training & awareness programmes to enhancement of farming practices  
Integrated Livestock Development activities  
Need based training for valuaddition to artisan  
Training for Truck Drivers and assistant | 0.5 |
| 7      | Assistance to self help groups | 0.5 |
|        | Total | 4.6 |

*****
CHAPTER-8
PROJECT BENEFITS

8.0 GENERAL
The proposed river sand mining project has a significant positive impact on the socio-economic environment of the area. It will help to sustain the development of the area. The proposed project will significantly contribute to the economic development of the area and to improve standards of living. The execution of the project i.e removal of sand will protect against widening of the river channel and flooding of adjoining areas, bring overall improvement in the locality, neighbourhood and the State by bringing industry, roads, water supply, electricity, employment, living standard and economic growth. The project will provide raw material for infrastructure development, increase employment opportunity and improve the socioeconomic condition of the area.

8.1 EMPLOYMENT GENERATION
Employment is expected to increase during sand excavation, sand transportation, in trade and other ancillary services. Employment in these sectors will be primarily temporary or contractual and involvement of unskilled labour will be more. A major part of this labour force will be mainly from local villagers who are expected to engage themselves both in agriculture and project activities. This will enhance their income and lead to overall economic growth of the area. The proponent feels that the proposed river sand mining project will help in generating newer employment opportunity both directly and indirectly. The core and buffer area will be benefitted as the employment preference will be given to locals. As the education level of the local area is low, employment might help create livelihood to the people. The proposed project will bring in job opportunities during operational phase. The man power requirement is based on quantity of production and transportation technology. The proposed mining activity will generate employment to the local people in this area. The proposed project will generate direct employment to 23 personnel. About 20 workers will be employed in mining operations, other supporting services and 3 no’s of managerial staff.

INDIRECT EMPLOYMENT
The project will also provide some indirect employment to the people of nearby area of mine site. Some people will get engaged in some pet shops like tea shop, vehicle repair centre etc. It will also provide some need based opportunity to the local public. The project will provide following indirect employment to the local people:-
- The bajri available will provide agency employment in the value chain analysis, for place utility and retail. Transportation and warehousing in the region required to transfer the mineral will eventually be needed and therefore trucks and jobs in logistical activities will come up.
- There will be development of externalities for the mine workers petty shops (tea, repair stations for trucks etc.) as supporting services.
- As there would be vocational training camps and Technical Training of mining to the regional people, hence there will be potential manpower available for the proposed and surrounding mines of the tehsil. This would create Indigenous Technologies for sustainable development

8.1.1 IMPROVEMENTS IN PHYSICAL AND SOCIAL INFRASTRUCTURE
The proposed project will enhance the socio-economic activities in the adjoining areas. This will result in following benefits:-
- Improvements in physical infrastructure.
- Improvements in social infrastructure.
- Generation of employment and improved standard of living
- Contribution to the exchequer.
- Prevention of illegal mining.
- Post-mining enhancement of green cover
CHAPTER 9
ENVIRONMENTAL MANAGEMENT PLAN

9.0 INTRODUCTION
The Environmental Management Plan must be integrated into the process of mine planning so that ecological balance of the area is maintained and adverse effects are minimized. Environmental Management Plan covers all phases of the project considering the all impacts with mitigation and monitoring program.
Preparation of Environmental Management Plan (EMP) is required for formulation, implementation and monitoring of environmental protection measures during and after commissioning of the proposed mining project.
The proposed EMP has indicated the details as to how various measures have been proposed to be taken. The baseline setting of different relevant environmental components in the study area and predicted potential impacts on those components due to the proposed project are documented. In this plan, mitigation measures for the identified environmental impacts are documented for operational stage of the proposed project in the form of an EMP. Proper Environmental Management Plan will be proposed for “River Sand” mining project to mitigate the anticipate impact during the mining operations.

The objectives of EMP are:
- Overall conservation of environment.
- Minimization of waste generation and pollution.
- Judicious use of natural resources and water.
- Safety, welfare and good health of the worker and populace.
- Ensure effective operation of all control measures.
- Vigilance against probable disasters and accidents.
- Monitoring of cumulative and long time impacts.
- Ensure effective operation of all control measures.

9.1 AIR ENVIRONMENT
In this proposed river sand mining project the only pollution occurs from dust (Particulate Matter) during excavation, vehicular activity, loading/unloading etc. regular water sprinkling arrangement will be provided in the ML area for dust suppression. Speed limited restricted to 20kmph in the mine area for the movement of machinery, trucks etc to control the dust emissions.
The following measures will be taken to reduce the impact on air quality:-
- Vehicles will be covered by tarpaulin to reduce spillage on roads.
- Regular checking & Maintenance of vehicles like; trucks, dumpers etc, will be conducted and pollution under control (PUC) vehicle will be used during transportation.
- Periodically, water will be sprinkled on haul roads to wet the surface.
- Overloading will be avoided to prevent spillage.
- Green belt of trees with good footage on both side of haul road.
- Dust mask provided to the workers engaged at dust generation points like excavations, loading and unloading points.
- Road will be properly maintained

FUGITIVE DUST CONTROL MEASUREMENT
A. During loading operations:-
1. Water will be sprayed during loading.
2. Regular maintenance of machinery and vehicles will be carried out to control dust emission during transportation.
3. Overloading will be prevented.

B. During Transport Operations:
1. Water sprinkling will be done during loading and on transportation routes.
2. It will be ensured that all transportation vehicles should carry a valid PUC certificate.
3. Trucks will be covered with tarpaulin sheet to prevent spillage of Bajri.

C. Plantation Work
1. Plantation will be carried out around approach road sides, river bank and nearby area.

9.1.1 CONTROL OF SO$_2$ & NO$_2$ LEVELS
The source of SO$_2$ & NO$_2$ will be due to vehicular emissions. This will be controlled by proper & regular maintenance and servicing of vehicles. The emissions of all vehicles used for transport will be in accordance with the MOEF/CPCB norms.

9.1.2 MEASURE TO CONTROL DUST INHALATION
All the above measures will be adopted to prevent dust generation at mining site during excavation activities and to be dispersed in the outside environment. However, for the safety of workers at site, engaged at strategic locations/dust generation points like loading, handling etc., dust masks will be provided. Dust masks will be preventing inhalation of particulate matter thereby reducing the risk of lung diseases and other respiratory disorders among the workers.

9.2 WATER MANAGEMENT & WATER POLLUTION CONTROL
9.2.1 SURFACE WATER
The major source of surface water pollution due to sand mining is insignificant, however, the following measures will be undertaken to prevent water pollution:
- Utmost care will be taken to minimize spillage of sand.
- Mining schedule will be synchronized with the river flow direction and the gradient of the land.
- The washing of trucks and tractor trolleys in the river will be avoided.
- Mining will be avoided during the monsoon season. This will help in replenishment of sand in the river bed.
- Mining will not intersect river bed water level or ground water table of the area.
- Mining will be carried out above the water table.
- Proper maintenance of machinery to prevent any leakage like oil or fuel.

9.2.2 GROUND WATER
There will not be any adverse effect on the ground water quality. The minor mineral does not contain any harmful chemical, which could percolate into the ground and pollute the ground water. Hence, no control measures are required. Septic tank and soak pits have been provided for the disposal of domestic effluent generated from domestic activity. However, regular monitoring of quality in the existing hand pumps/tube wells in the vicinity will be carried out both with reference to area and times intervals to study the hydrodynamics of the strata.

9.3 NOISE ENVIRONMENT
As there will be no heavy earth moving machinery there will not be any major impact on noise level due to river sand mining and other association activities a detailed noise survey has been carried out and results were cross referenced with standards and were found to be well within limits. It is
predicated that the proposed river sand mining activity will not have any significant impact on the noise environment in the region. The only impact will be due to transportation of river sand by trucks and tractor trolleys.

The following control measures shall be taken to keep the ambient noise levels well within limits:

- Minimum use of horns and speed limit of 20kmph in the village.
- Timely maintenance of vehicles and their silencers to minimize sound.
- Care will be taken to produce minimum sound during river sand loading.
- Provision of green belt development to consultation with forest officer along the road network and nearby area.
- Phasing out of old and worn out trucks.

9.4 LAND ENVIRONMENT

Degradation of land is not a very significant adverse impact of riverbed mining due creation of access roads, mining operations, transportation of mined material. In order to prevent the environmental degradation of leased mine area and its surroundings, the following measures will be taken:

- Safe clearance will be mainly determined by the width of the river bed.
- Creation of ponds and pits on river bed will not be allowed.
- Mining will be carried out during day time only.
- No foreign material will be allowed to remain in river bed and catchment area or no pits/pockets will be allowed to be filled with such material.
- As the lease area in quite large and long in length systematic extraction will be carried out to prevent seasonal scouring and enhanced erosion.
- 45.0 m radius around the well located in the river bed will not have any mining activity.
- Measures will be taken to prevent the working form crossing safety zones. Cutting the banks and 3.0 m depth limit of the river bed surface.
- As the lease area in quite large and long in length systematic extraction will be carried out to prevent seasonal scouring and enhanced erosion.
- Mining on the concave side of the river channel should be avoided to prevent bank erosion. Similarly meandering segment of river will be selected to prevent natural eroding banks and to promote mining on natural building (aggrading) meanders component.

9.4.1 POST MINING LAND USE PATTERN

At the end of mining period about 33.50Ha area will be mined out. Land use at various stages is given in below table;

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Particulars</th>
<th>Present Land Use (Ha.)</th>
<th>At the End of 3rd Year (Ha.)</th>
<th>At the End of 5th Year (Ha.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mine Area</td>
<td>0.0</td>
<td>20.10</td>
<td>33.50</td>
</tr>
<tr>
<td>2</td>
<td>Dump Area</td>
<td>0.0</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>Safety Zone (Permanent Roads 6 Nos.)</td>
<td>53.56</td>
<td>56.18</td>
<td>59.18</td>
</tr>
<tr>
<td>4</td>
<td>Infrastructure (Office, Temp. Shelter etc.)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>Mineral Storage</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>Plantation</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
9.5 SOIL CONSERVATION
There is no soil over mineralized area; however the receding floods in the monsoon season deposit some clay/soil carried down by river water. It is hardly a few millimeters thick and of not much consequence. Even in the areas of no mining activity the process of deposition in one season and transportation of previously deposited material in the next season takes place along with deposition of fresh material by receding floods. Soil quality will be monitored in the area surrounding the core zone used for agricultural activity to check for any negative impacts on the soil quality. Plantation activity shall be undertaken in consultation with village Panchayat near the river banks, village roadside to improve the land quality, aesthetics and reduce soil erosion.

9.6 BIOLOGICAL ENVIRONMENT
The mining activity will have insignificant effect on the existing flora and fauna. Data have been collected from various Government Departments such as forests, agriculture, animal husbandry and various offices to establish the pre project biological environmental conditions.

9.6.1 GREENBELT DEVELOPMENT
Greenbelt development program will be designed within the natural constraints of the river sand area and in particular species selection reflects flora known to be resistant to the local conditions.

A Greenbelt development is necessary for:

1. Landscaping and providing shelter
2. Help in reducing Pollution level
3. Surface air purification by providing oxygen and letting SPM to settle on the leaves.
4. To attenuate noise generation by movement of vehicles and other machinery.
5. Prevent soil erosion to great extent.
6. Improve ecological conditions.
7. Improves the aesthetics & beneficially influence the microclimate of the surrounding.

The following characteristics will be taken into consideration while selecting plant species for green belt development and tree plantation.

a. They should be local indigenous and drought resistant species.
b. They should be fast growing and tall trees.
c. They should be perennial and evergreen.
d. They should have thick and large canopy cover.
e. The planting should be in appropriate alternate rows around the site to prevent lateral pollution dispersion.
f. The trees should maintain regional ecological balance and conform to soil and hydrological conditions. Indigenous species should be preferred.
g. Native species will be planted as per CPCB guidelines.

9.6.2 PLANTATION PROGRAMME
The lease is in the river bed and devoid of any vegetation. It is proposed to have plantation on both sides of the roads, government land, schools & along the bank of river as greenbelt to provide cover...
against dust dissemination plantation will also be carried out as social forestry programmed in villages, schools and the areas allocated by the Panchayat/State authorities. 

The following plant species will be planted according to CPCB guidelines: Cassia fistula (Amaltas), Delbergia sissoo (Sisam), Mangifera indica (Mango), Acacia nilotica (Babul), Azadirachta indica (Neem), Butea monosperma (Palash), *Ficus religiosa* (Peepal) etc. A suitable combination of trees that can grow fast and also have good leaf cover shall be adopted to develop the greenbelt. It is proposed to plant native species per year along with trees, herbs, shrubs & grasses as following table;

Table 9.2 Green Belt Development Plan Year Wise

<table>
<thead>
<tr>
<th>Year of Plantation</th>
<th>Target of Plantation</th>
<th>Assumed survival (80%)</th>
<th>Replacement of Casualties</th>
<th>Total Plants</th>
<th>Area to be covered in Ha.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Year</td>
<td>600</td>
<td>480</td>
<td>----</td>
<td>480</td>
<td>1.3</td>
</tr>
<tr>
<td>2nd Year</td>
<td>750</td>
<td>600</td>
<td>150</td>
<td>750</td>
<td>1.63</td>
</tr>
<tr>
<td>3rd Year</td>
<td>850</td>
<td>680.</td>
<td>170</td>
<td>850</td>
<td>1.85</td>
</tr>
<tr>
<td>4th Year</td>
<td>1050</td>
<td>840</td>
<td>210</td>
<td>1050</td>
<td>2.28</td>
</tr>
<tr>
<td>5th Year</td>
<td>1200</td>
<td>960</td>
<td>240</td>
<td>1200</td>
<td>2.61</td>
</tr>
<tr>
<td>Total</td>
<td>4450</td>
<td>3560</td>
<td>770</td>
<td>4330</td>
<td>9.67</td>
</tr>
</tbody>
</table>

Table 9.3 List of Plantation

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Botanical Name</th>
<th>Common Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Polyalthia longifolia</td>
<td>Ashoka</td>
</tr>
<tr>
<td>2</td>
<td>Butea monosperma</td>
<td>Palas</td>
</tr>
<tr>
<td>3</td>
<td>Acacia nilotica</td>
<td>Babool</td>
</tr>
<tr>
<td>4</td>
<td>Acacia catechu</td>
<td>Kattha</td>
</tr>
<tr>
<td>5</td>
<td>Syzygium cumini</td>
<td>Jamun</td>
</tr>
<tr>
<td>6</td>
<td>Mangifera indica</td>
<td>Aam</td>
</tr>
<tr>
<td>7</td>
<td>Ficus religiosa</td>
<td>Peepal</td>
</tr>
<tr>
<td>8</td>
<td>Cassia fistula</td>
<td>Amaltas</td>
</tr>
<tr>
<td>9</td>
<td>Azadirachta indica</td>
<td>Neem</td>
</tr>
<tr>
<td>10</td>
<td>Ficus benghalensis</td>
<td>Bargad</td>
</tr>
<tr>
<td>11</td>
<td>Dalbergia sissoo</td>
<td>Shisham</td>
</tr>
<tr>
<td>12</td>
<td>Pongamia pinnata</td>
<td>Karanj</td>
</tr>
<tr>
<td>13</td>
<td>Tecomella undulata</td>
<td>Rohida</td>
</tr>
<tr>
<td>14</td>
<td>Tectona grandis</td>
<td>Teak</td>
</tr>
<tr>
<td>15</td>
<td>Delonix regia</td>
<td>Kachnar</td>
</tr>
<tr>
<td>16</td>
<td>Boswellia serrata</td>
<td>Salar</td>
</tr>
</tbody>
</table>

List of the Shrubs

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Botanical Name</th>
<th>Common Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Eucalyptus canaldulensis</td>
<td>Eucalyptus</td>
</tr>
<tr>
<td>2</td>
<td>Polyalthania Longifolia</td>
<td>Ashok</td>
</tr>
<tr>
<td>3</td>
<td>Ziziphus mauritiana</td>
<td>Ber</td>
</tr>
<tr>
<td>4</td>
<td>Ricinus cummunicis</td>
<td>Aranda</td>
</tr>
</tbody>
</table>

List of Herbs

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Common Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rose Centifolia</td>
</tr>
<tr>
<td>2</td>
<td>Lawsonia Inermis</td>
</tr>
<tr>
<td>3</td>
<td>Datura metal</td>
</tr>
<tr>
<td>4</td>
<td>Aloevera</td>
</tr>
</tbody>
</table>
List of Grasses

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Common Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Achyranthus aspera</td>
<td>Ulta Kanta</td>
</tr>
<tr>
<td>6</td>
<td>Asparagus racemos</td>
<td>Shatavari</td>
</tr>
<tr>
<td>7</td>
<td>Chlorophytum borivilianum</td>
<td>Safed musli</td>
</tr>
</tbody>
</table>

9.6.3 GENERAL GUIDELINES FOR GREEN BELT DEVELOPMENT

1. Plantation of trees will be done along road side and nearby areas such as in school, villages etc to arrest auto-exhaust and noise pollution and in such a way that there is no direct line of sight to the mine when viewed from a point outside the foliage perimeter.

2. Since tree trunks are normally devoid of foliage (up to 3.0m), it will be appropriate to have shrubbery in form of such trees to give coverage to trunk portion of these trees.

3. Fast growing trees with thick perennial foliage will be grown, as it will take many years for trees to grow to their full height.

In order to facilitate the proper growth of vegetation, limited measures involving preparation of seedbed with suitable amount of fertilizers and treatment with mulches will be taken.

Vegetation covers in and around the mine workings generally helps in:

1. Stabilizing erodible slopes to minimize pollution.
2. Control of dust.
3. Enhancement of aesthetic value.
4. Maximizing evapo-transpiration, which helps minimizing run off.
5. Reducing noise.

9.7 SOCIO-ECONOMIC ENVIRONMENT

This project operation will provide livelihood to the poorest section of the society. The overall impact of riverbed mining of sand on the social economics of the area will be a very positive one, as not only it will generate employment opportunities for local population at mine site but also in associated activity i.e. for transportation of mined material, etc. It will also give a good boost to the general economy of the area. The mining activity in the lease area will thus give direct employment to about 23 persons engaged in extraction of sand, loading of material into tractor trolleys and tipper trucks.

9.7.1 ANTICIPATED IMPACTS AND EVALUATION

The results of the field survey conducted based on a questionnaire prepared to understand the knowledge and perception of the people living around the project area, gives a clear idea about the need for the project. The awareness level regarding the proposed mining activity is very high. The proposed mining activity is expected to provide stimulus to socio-economic activities in the region and thereby accelerate further development processes.

9.8 OCCUPATIONAL HEALTH & SAFETY

The proposed mining is to be carried out by semi-mechanized opencast mining. Dust and noise are the general health hazards for the miners. The project proponent will strictly implement all the prescribed safety measures, although the magnitude of mining is very less. High safety is ensured in the working conditions of the miners. Since it is an opencast mine, health problems due to dust may be expected. Protective equipment will be provided to the employees such as dust masks. By using these PPEs, the chances of occupational health diseases will be lowered. The health of the workers will be regularly checked and suitable medical facilities will be created by the lessees. By periodical medical checkup & treatment and job rotation of employees, the impact would be minimized.
9.8 BUDGETARY PROVISION FOR EMP IMPLEMENTATION & MONITORING

It is necessary to include the environmental cost as a part of the budgetary cost component. As per the Rajasthan Minor Mineral Concession (Third Amendment) Rules, 2012 dated 08-10-2012, lessee will deposit contribution in environment management fund to meet out the financial requirement of association/agency for carrying out environmental protection work as per the environment management plan @Rs. 5/- per ton of mineral dispatch. Presently lease holder already deposited E.M.F @Rs. 5/- per ton of mineral dispatch to State Mining Department.

In order to implement the environmental protection measures, timely funds will be released as per requirement. In addition to above, it is proposed to invest a capital cost of Rs. 13.00 lac on pollution control, green belt and environmental monitoring systems. The break-up of the investment is given in the following Table.

**Table No.: 9.4 Annual Capital Cost for Environmental Protection Measures**

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Particulars</th>
<th>Frequency</th>
<th>Capital cost in Lac per year</th>
<th>Recurring cost in Lac per Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Existing</td>
<td>Proposed</td>
</tr>
<tr>
<td>1</td>
<td>Pollution Control Water Sprinkling</td>
<td>Regular</td>
<td>Nil</td>
<td>2.0 Lac</td>
</tr>
<tr>
<td>2</td>
<td>Environmental Pollution Monitoring i.e Water, Air, Soil &amp; Noise etc.</td>
<td>Half Yearly</td>
<td>Nil</td>
<td>--</td>
</tr>
<tr>
<td>3</td>
<td>Plantation including Maintenance</td>
<td>@ 800 Plant Per Year</td>
<td>Nil</td>
<td>--</td>
</tr>
<tr>
<td>4</td>
<td>Budget for Conservation of Schedule I Fauna</td>
<td>Yearly</td>
<td>Nil</td>
<td>0.30 Lac</td>
</tr>
<tr>
<td>5</td>
<td>Others (specify) Haul road and other roads repair and maintenance</td>
<td>Regular</td>
<td>Nil</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Wire fencing at plantation site</td>
<td></td>
<td>Nil</td>
<td>0.20</td>
</tr>
<tr>
<td></td>
<td>Rainwater Harvesting</td>
<td></td>
<td>Nil</td>
<td>1.0 Lac</td>
</tr>
</tbody>
</table>

| Total (13.00 Lac ) | Nil | 3.50 Lac | Nil | 9.50 Lac |

*****
CHAPTER-10
SUMMARY AND CONCLUSION

10.1 INTRODUCTION OF PROJECT & PROPOONENT
Mr. Himmat Singh Shekhawat, 98, Roop Rajat Township, Phase-II, Pal Road, Jodhpur propose to develop a River Sand mine in, Revenue villages (covering 26 villages) of Tehsil: Nathdwara, District: Rajsmand, State: Rajasthan having lease area is 773.2797Ha does not fall in forest land. It has been proposed to collect sand from the river bed, nadi & nallas. River beds and nalas under mining lease areas are owned by Govt. of Rajasthan. Mining lease is award for fresh grant to state Mining Department for a period of 05 years with effect from the date of registration.
Mining will be confined to the allotted lease area which lies on the river bed which approximately 2.80 lac Ton of sand will be excavated and the estimated project cost is Rs. 68 lac.

LOCATION
The mining area is located in 26 revenue villages of Tehsil: Nathdwara, District: Rajsmand. The mining lease/proposed project area falls in Survey of India Toposheet No. 45H/9, 45 H/13, 45G/12, 45 G/16.

Table No. 10.1 Detail of Environment Setting

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Particulars</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Village</td>
<td>26 revenue villages of Nathdwara Tehsil</td>
</tr>
<tr>
<td>2</td>
<td>Tehsil</td>
<td>Nathdwara</td>
</tr>
<tr>
<td>3</td>
<td>District</td>
<td>Rajsmand</td>
</tr>
<tr>
<td>4</td>
<td>State</td>
<td>Rajasthan</td>
</tr>
<tr>
<td>5</td>
<td>River Name</td>
<td>Banas &amp; Lapli</td>
</tr>
<tr>
<td>6</td>
<td>Nearest Town</td>
<td>Nathdwara</td>
</tr>
<tr>
<td>7</td>
<td>Nearest Tourist Place</td>
<td>Udaipur</td>
</tr>
<tr>
<td>8</td>
<td>Nearest Highway</td>
<td>NH-8 , SH-49</td>
</tr>
<tr>
<td>9</td>
<td>Nearest Railway Station</td>
<td>Nathdwara about 20 km</td>
</tr>
<tr>
<td>10</td>
<td>Nearest Airport</td>
<td>Udaipur, Dabok (40 km)</td>
</tr>
<tr>
<td>11</td>
<td>Ecological Sensitive Areas (National Park, Wild Life Sanctuaries, etc.)</td>
<td>Nil</td>
</tr>
<tr>
<td></td>
<td>Reserve/Protected Forest</td>
<td>There are some RF/ PF present in the study area which are as follow</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Open Mix Jungle (about 9.0 km)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Open Jungle (about 3.5 km)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Open Jungle (about 9 km)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Open Mix Jungle (about 9.0 km)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Protected Forest (about 5 km)</td>
</tr>
<tr>
<td>14</td>
<td>Seismic Zone</td>
<td>Zone II. No major event is reported in past.</td>
</tr>
</tbody>
</table>

The salient features of the project are given below:
Table No. 10.2 Salient Features

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Particulars</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Project Name</td>
<td>River sand mining at revenue villages at Tehsil: Nathdwara, District: Rajsmand</td>
</tr>
<tr>
<td>2</td>
<td>Proposed Capacity</td>
<td>2.80LTPA</td>
</tr>
<tr>
<td>3</td>
<td>Method of Mining</td>
<td>Semi-mechanized</td>
</tr>
<tr>
<td>4</td>
<td>Mineable Reserve</td>
<td>302.27 Lac tonnes</td>
</tr>
<tr>
<td>5</td>
<td>Lease Area</td>
<td>773.2797 Ha.</td>
</tr>
<tr>
<td>6</td>
<td>Water Requirement</td>
<td>5 KLD</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Domestic Water Demand: 2 KLD</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dust Suppression &amp; Plantation: 3KLD</td>
</tr>
<tr>
<td>7</td>
<td>Water Supply</td>
<td>Tanker Water Supply</td>
</tr>
<tr>
<td>8</td>
<td>Manpower</td>
<td>23</td>
</tr>
<tr>
<td>12</td>
<td>Total Project Cost</td>
<td>Rs. 68 Lac</td>
</tr>
<tr>
<td>13</td>
<td>Cost for Environmental Protection Measures</td>
<td>Rs. 13.0 Lac</td>
</tr>
<tr>
<td>14</td>
<td>Cost for CSR Activities</td>
<td>Rs. 4.6 Lac</td>
</tr>
</tbody>
</table>

10.2 PROJECT DESCRIPTION
The mining process is opencast semi-mechanized river bed mining of minor minerals. Drilling and blasting is not required as the material is soft in nature. As per MMCR rules 1986 extraction is limited to 3.0 m depth only from the surface. Entire stretch of the lease area is around 50.0 km long has been divided in to five block only for smooth working. Mineral will be removed in 3.0 m layer only forming one bench. Bench will advance from South west to North East direction in the river. Height of bench will be 3.0 m. Light weight excavators will be deployed for extraction. Mineral will be loaded in trucks of 20 tones capacity trucks and equipment, earth movers will be on hire basis. There will be no overburden or waste generation because the Bajri is exposed in the river bed. Mining work shall be carried out in one bench and it must not be more than 3mt deep from surface level of river bed. The mine face will be inclined towards the periphery for safety purpose. Water shall be sprinkled on Bajri (River Sand) to suppress any dust that may be raised during digging and loading operations. Extraction and loading of mineral into trucks shall be carried out mechanically. Silt extracted if any shall also be loaded mechanically and stacked separately. Depth of water table in this area is 10 -15m BGL.
The mine lease area spreads in 773.27 ha, which is a government land. The land form is mostly river bed and non-forest land. Moreover there will be no change in land use as the mining will be confined to river bed, which will get replenished naturally in the subsequent monsoon season.

10.3 ANALYSIS OF ALTERNATIVES
After the complete analysis of the technologies and the nature of the material to be extracted, mining will be done by semi mechanized open cast method, using light weight excavator sand directly loading of minerals in trucks and tractors. This is one of the most eco friendly methods to minimize the impact of the mining on surrounding environment.

10.4 DESCRIPTION OF ENVIRONMENT
This section contains the description of baseline studies of the 10 km radius of surrounding of project site area. The data collected has been used to understand the existing environment scenario around the proposed mining project against which the potential impacts of the project can be assessed. Environmental data has been collected in relation to propose mining for:-

a. Air
b. Water
c. Noise
d. Soil
e. Biological
f. Socio-economic

The project activities will not have any adverse impacts on any of the common property resources of the village communities, as the sand mine lease area is not being used for any purpose by any section of the society in this region. There is no R&R & land acquisition.

(a) Air Quality

Results of the ambient air quality at all the locations were found to be well within the limits of National Ambient Air Quality (NAAQ) standards. Concentrations of, PM$_{10}$, SO$_2$, NO$_2$ and CO are mainly contributed due to vehicular traffic and local activities.

(b) Water Quality

The analysis results indicate that the pH of the ground waters was to be in the range of 7.29 to 7.63. The TDS were found to be in the range of 475.96 to 508.0 mg/L. Other parameters like Chlorides and Sulphates were observed to be well within the prescribed limits. From the table, it is seen that the physic chemical analysis for all the parameters has within the standards as per IS: 10500:2012

(c) Noise Level

The noise levels at all the locations are observed to be in the range of 35.4 dB (A) to 54.6 dB (A). The maximum noise level of 54.6 dB (A) was observed at Kankroli and the minimum noise level of 35.4 dB (A) was observed at Kolora during the study period. It is observed that the noise levels are in accordance to the prescribed limits.

(d) Soil Quality

Soil quality of the study area is one of the important components of the environment. Soil samples from villages located in the study area are collected as per methodology specified in BIS to make them representative and analyzed for physico-chemical analysis. Samples collected from identified locations indicate pH value ranging from 7.55 to 8.08, which shows that the soil is alkaline in nature. Organic Matter ranges from 0.049% to 0.89% in the soil samples.

Biological Environment


Fauna: The wild lives present in the study area mainly includes *Lepus nigricollis*, *Hystrix indica*, *Sus scrofa indicus*, *Macaca mullata*, *Presbytis entellus*, *Felis chaus*, *Canis areus*, *Vulpes bengalensis*, *Ptyas mocosus*, *Bungarus Caeruleus*, *Gecko hemidactylus*, *Gallus gallus*, *Pavo cristatus*, *Francolinus pondicerianus*, *Francolinus Francolinus* *Dinopium benghalense*, *Pycnonotus cafer*, *Acridotheres Grisea*, *Saxicoloides fulicataeyc*.

(e) Socio-Economic Status

The information on socio-economic aspects of the study area has been compiled from secondary sources, which include various public offices as indicated in the above section. The sociological aspects of this study include human settlements, demography, social such as Scheduled castes and Scheduled Tribes and literacy levels besides infrastructure facilities available in the study area. The economic aspects include occupational structure of workers.

10.5 ANTICIPATED ENVIRONMENTAL IMPACTS, MITIGATION MEASURES

ENVIRONMENTAL MANAGEMENT PLAN

The mining activities involve, dozing, excavation, loading, haulage and transportation of
sand. These activities lead to generation of air borne dust, which can cause air pollution in and around the mining lease area, if appropriate control measures are not taken. Similarly mining causes Land Degradation, Noise and Water Pollution etc. in the area. In order to minimize impacts of mining on different environmental parameters and to keep air and water quality within prescribed limits of CPCB, a rapid Environmental Management Plan (EMP) is prepared to strictly follow it. This helps in resolving all environmental and ecological aspects.

10.5.1 Noise Environment
Regular maintenance of machinery will keep the generated noise level at minimum. All machines will be as per stipulated standards and used at their optimum capacity. Only trained operators will be allowed to operate machines. Plantation of trees along the bank as well as both side of the road will be done to dampen the noise. Ear-muffs, ear-plugs, etc. will be used for hearing protection (if applicable). No working will be carried out in the night hours.

10.5.2 Water Environment
No chemical/ fueling to machineries will be done at the site. Thus no chances of spill of chemicals / similar compounds will be occur. Mining will not be done beyond the stipulated depth.

10.5.3 Biological Environment
It is proposed to plant local trees and bushes along the river banks and both sides of the roads in consultation with local authority/ Govt. Body. Plantation will also be carried out as social forestry programmed in villages school and the areas allocated by the Panchayat/ State Authorities. Native plants like Desi Kikar, Neem, Pipal, Khejari, Dhok and other species will be planted with suitable combination of tress that can grow fast. It is proposed to plant 400 nos. of native species along with some fruits bearing and medical tress.

10.5.4 Water Requirement
5 KLD - (3 KLD domestic + 2 KLD for plantation).

Water Source: Tanker Water Supply

10.6 AVAILABLITY OF FUNDS FOR ENVIRONMENT PROTECTION MEASURES
The management of the project is very conscious to minimize the existing pollution load in the lease area. Following provision are proposed to be taken for improving, control and monitoring of environment protection measure:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Particulars</th>
<th>Amount in Lacs/ Annum</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pollution Monitoring- Air, Water, Noise</td>
<td>5.0</td>
</tr>
<tr>
<td>2</td>
<td>Pollution Monitoring- Water sprinkling</td>
<td>4.0</td>
</tr>
<tr>
<td>3</td>
<td>Wire fencing at plantation sites</td>
<td>0.2</td>
</tr>
<tr>
<td>4</td>
<td>Plantation including maintenance</td>
<td>0.30</td>
</tr>
<tr>
<td>5</td>
<td>Rain water Harvesting</td>
<td>1.5</td>
</tr>
<tr>
<td>6</td>
<td>Haul road and other roads repair maintenance</td>
<td>2.0</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>13.0</strong></td>
</tr>
</tbody>
</table>

10.7 IMPLEMENTATION SCHEDULE
The implementation of these mitigation measures, it is important to monitor various environmental parameters so as to ensure proper working of all the environmental control measures. This section presents the monitoring schedule and infrastructural requirement for environmental protection in Table 10.2 as given below:
Table 10.3 Monitoring Schedule for Environmental parameters

<table>
<thead>
<tr>
<th>S. No</th>
<th>Potential Impact</th>
<th>Description of Parameters</th>
<th>Parameters for monitoring</th>
<th>Frequency of monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ambient Air</td>
<td>Air Quality: a) In the vicinity of the mine b) In the vicinity of the transportation Network c) Dust suppression on roads d) Scraping/ bulldozing of road to shift accumulated dust to the sides</td>
<td>PM$_{10}$, SO$_2$, NO$_2$ and CO</td>
<td>As per CPCB/ RSPCB requirement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vehicle trips to be minimized to the extent possible</td>
<td>Vehicle logs</td>
<td>Daily records</td>
</tr>
<tr>
<td>2</td>
<td>Ambient Noise Level</td>
<td>Equipment and machinery noise levels, &amp; occupational exposures</td>
<td>Leq (night) Leq (day)</td>
<td>Periodic during operation phase</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Generation of vehicular noise</td>
<td>Maintain records of vehicles</td>
<td>Periodic during operation phase</td>
</tr>
<tr>
<td>3</td>
<td>Water quality and water levels</td>
<td>Samples from the nearby surface water bodies and ground water samples from the nearby villages</td>
<td>Physico-chemical and instrumental methods of analysis. For the parameters prescribed in the consent conditions of state pollution Control Board.</td>
<td>Periodic during operation phase</td>
</tr>
<tr>
<td>4</td>
<td>Maintenance of Green Belt</td>
<td>Vegetation, greenbelt/ green cover development</td>
<td>Tree Plantation</td>
<td>Periodic during operation phase</td>
</tr>
<tr>
<td>5</td>
<td>Soil quality</td>
<td>In buffer zone</td>
<td>Physico- chemical parameters</td>
<td>Periodical Monitoring</td>
</tr>
<tr>
<td>6</td>
<td>River Sand Replenishment</td>
<td>Replenishment</td>
<td>Sand budget</td>
<td>Pre and Post Monsoon</td>
</tr>
</tbody>
</table>

10.8 CONCLUSION & RECOMMENDATION

As discussed, it is safe to say that the proposed facilities are not likely to cause any significant impact to the ecology of the area, as adequate preventive measures will be adopted to keep the various pollutants within the permissible limits. Green belt development around the area will also be taken up as an effective pollution mitigative technique, as well as to serve as biological indicators for the pollutants released from the premises of River sand Mine".
## CHAPTER - 11:
DISCLOSURE OF CONSULTANTS

Name of the Project: River Sand Mining at Revenue village of Tehsil: Nathdwara,District: Rajsamand (Raj)

Project Proponent: **Himmat Singh Shekhawat**

<table>
<thead>
<tr>
<th>Nature of consultancy</th>
<th>Name and address of the Consultant/expert</th>
<th>Approvals, if any from (NABL/ DGMS/ IBM/ NRBPT/ MOEF/ CPCB/others etc)*, give reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>EIA/ EMP Organization</td>
<td>Enviro Concept(I) Pvt Ltd 1/3 A. Yudhister Marg, C-Scheme,Jaipur</td>
<td>ISO 9000-2008 certified. EMS 14001  Applied for NABET Accreditation</td>
</tr>
<tr>
<td>Env. Coordinator</td>
<td>Devendra Goyal</td>
<td>Permission Granted by Honble High Court of Rajasthan, Copy of the same is enclosed as Annexure No. 5</td>
</tr>
<tr>
<td>FAE-LU</td>
<td>Dr. K.N.Joshi</td>
<td></td>
</tr>
<tr>
<td>FAE-AP</td>
<td>Mr. Devendra Goyal Mr. Ghanshyam Das</td>
<td></td>
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<tr>
<td>FAE-AQ</td>
<td>Mr. Devendra Goyal Mr. Ghanshyam Das</td>
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<tr>
<td>FAE-WP</td>
<td>Mr. A.K.Seth</td>
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<tr>
<td>FAE-EB</td>
<td>Mr. Pramod Dagla AFAE Mr. RK Kumawat</td>
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<tr>
<td>FAE-NV</td>
<td>Dr. Devendra Goyal AFAE Mr. RK Kumawat</td>
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<td>FAE-SE</td>
<td>Dr.K.N.Joshi</td>
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<tr>
<td>FAE-HG</td>
<td>Dr. M.L.Jhanwar</td>
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<td>FAE-G</td>
<td>Dr. M.L.Jhanwar</td>
<td></td>
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<tr>
<td>FAE-RH</td>
<td>Mr. Deepak Sharma</td>
<td></td>
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<tr>
<td>Soil Conservation</td>
<td>Mr. O.P.Mathur</td>
<td></td>
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<tr>
<td>FAE-SHW</td>
<td>Mr. Devendra Goyal</td>
<td></td>
</tr>
<tr>
<td>Environmental Monitoring &amp; analysis</td>
<td>Noida Testing Laboratories Ltd. Greater Noida</td>
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<tr>
<td>Rainwater Harvesting</td>
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</tr>
</tbody>
</table>
I hereby undertake that all the points raised in the TOR issued by MOE&F are complied with. I also undertake that the facts given in the REIA/EMP report are factually correct to the best of our knowledge.

EIA Coordinator
Enviro Concept (I) Pvt Ltd
Jaipur

I hereby accept all the liabilities and obligations associated with the working and results of the above organizations herein with the report.

(Signature & Name of Project Proponent)
APPROVED TOR LETTER

By Speed Post

No. J-11015/211/2013-IA.II (M)
Government of India
Ministry of Environment and Forests
IA Division

Paryavaran Bhavan,
C.G.O. Complex, Lodhi Road,
New Delhi-110 003
Telefax: 011-24384067

Dated: 14th October, 2013

To

M/s Himmat Singh Shekhawat,
98, Rooprajta Township,
Phase-II, Pall Road,
Jodhpur, Rajasthan-342008

Sub.: River Sand Mining Project (Production Capacity 2.80 Lakh TPA) of M/s Himmat Singh Shekhawat, located at vill-Revenue, Tehsil-Nathdwara, Distt-Rajsamand, Rajasthan (773.27ha) – Prescribing TORs regarding.

This has reference to your letter no. Nil dated 03.07.2013 regarding the proposal for determining the Terms of Reference (TORs) for undertaking detailed EIA study for the purpose of obtaining environmental clearance in accordance with the provisions of the EIA Notification, 2006. For this purpose, the Proponent had submitted information in the prescribed format (Form-1) along with a Pre-feasibility Report. The proposal was considered by the Reconstituted Expert Appraisal Committee in its 10th meeting held during August 21st -23rd, 2013.

2. It is noted that State Government of Rajasthan has adopted a policy under which huge sand mining leases, almost covering a Tehsil in some cases, are being offered to the project proponent. In this context, mining plan needs to be prepared carefully, dividing mine lease area into manageable blocks to ensure scientific and systematic mining of minor minerals. Further, the base line data shall be carefully collected so as to represent the whole mine lease area.

3. The proposal of M/s Himmat Singh Shekhawat for River Sand Mining with the Production Capacity 2.80 Lakh TPA of Sand in 773.27 ha. The mine lease is located at village-Revenue, Tehsil-Nathdwara, Distt-Rajsamand, Rajasthan. The Coordinate of river (Barach & Lapli River) having Latitudes 24° 54’ 49” N to 25° 01’13” N and Longitudes 73°37’19” E to 73° 56’10” E.

4. The Department of Mines & Geology, Govt. of Rajasthan has awarded the lease for 5 years vide Letter No. P10(3)Mine/Group-2/2013 dated 05.03.2013 in favor of Mr. Himmat Singh Shekhawat. Mining will be carried out by opencast semi - mechanized method. River Sand Mining will be restricted to 3 meter depth from the top of the sand bed and will be kept 1-2 meter above the water level of the river. Total...
water requirement of the project will be 5 KLD for dust suppression & plantation and met from nearby tube-well or tankers. Mining will be done in day time and restricted in heavy rainfall. No natural cause of the river will be changed. Capital cost of the project is Rs 68 Lac.

5. Based on the information content in the documents submitted and the presentation made before the Committee for mining projects, the following TORs are prescribed for undertaking detailed EIA study:-

1) Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification, 1994 came into force w.r.t. the highest production achieved prior to 1994.

2) A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.

3) All documents including approved mine plan, EIA and public hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management and mining technology and should be in the name of the lessee.

4) All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/toposheet should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).

5) Does the company have a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/violation of the environmental or forest norms/conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large may also be detailed in the EIA report.

6) Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.

7) The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc should be for the life of the mine / lease period.

8) Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.

9) Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.
10) A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.

11) Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.

12) Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.

13) The vegetation in the RF / PF areas in the study area, with necessary details, should be given.

14) A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly detailed mitigative measures required, should be worked out with cost implications and submitted.

15) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Tiger/Elephant Reserves (existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the State Wildlife Department/Chief Wildlife Warden under the Wildlife (Protection) Act, 1972 and copy furnished.

16) A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.

17) Proximity to Areas declared as ‘Critically Polluted’ or the Project areas likely to come under the ‘Aravalli Range’, (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Dept. Should be secured and furnished to the effect that the proposed mining activities could be considered.

18) Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).
19) R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs/STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village located in the mine lease area will be shifted or not. The issues relating to shifting of Village including their R&R and socio-economic aspects should be discussed in the report.

20) One season (non-monsoon) primary baseline data on ambient air quality (PM$_{10}$, SO$_2$ and NOx), water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM$_{10}$, particularly for free silica, should be given.

21) Air quality modelling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modelling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.

22) The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.

23) Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.

24) Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.

25) Impact of the project on the water quality, both surface and groundwater should be assessed and necessary safeguard measures, if any required, should be provided.

26) Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.

27) Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.
28) Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.

29) A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the project.

30) Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered.

31) Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA report.

32) Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.

33) A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given.

34) Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP.

35) Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.

36) Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.

37) Detailed environmental management plan to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.

38) Public hearing points raised and commitment of the project proponent on the same along with time bound action plan to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.

39) Details of litigation pending against the project, if any, with direction/order passed by any Court of Law against the project should be given.

40) The cost of the project (capital cost and recurring cost) as well as the cost towards implementation of EMP should clearly be spelt out.

41) Details of replenishment studies.

42) Details of Transportation of mined out materials as per the Indian Road
Congress for both the ways (loaded as well as unloaded trucks) load and its impact on Environment.

43) Proper species specific Conservation plan for Schedule-I and II species.
44) Impact of mining on plankton.
45) Details of mining activity to be provided w.r.t Block Wise/ Calendar wise/ Zonal wise, as the mine lease area having a long stretch.
46) Details of Gradient of river bed to be provided.
47) Details of excavation schedule & sequential mining plan.
48) The Mining Plan shall be prepared carefully, dividing lease area into manageable blocks to ensure scientific and systematic mining of minor minerals.
49) The base line data shall be collected so as to represent the whole mine lease area.

6. Besides the above, the below mentioned general points are also to be followed:-
   a) All documents to be properly referenced with index and continuous page numbering.
   b) Where data are presented in the report especially in tables, the period in which the data were collected and the sources should be indicated.
   c) Where the documents provided are in a language other than English, an English translation should be provided.
   d) The Questionnaire for environmental appraisal of industrial projects as devised earlier by the Ministry shall also be filled and submitted.
   e) While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MoEF vide O.M. No. J-11013/41/2006-IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry, should also be followed.
   f) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the F.R for securing the TOR) should be brought to the attention of MoEF with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.
   g) As per the circular no. J-11011/618/2010-IA.II(I) dated 30.5.2012, you are requested to submit certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project by the Regional Office of Ministry of Environment & Forests, if applicable.

7. The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.
8. The prescribed TORs would be valid for a period of two years for submission of the EIA/EMP reports, as per the O.M. No. 1-11013/41/2006-IA.II(I) dated 22.3.2010.

9. After preparing the draft EIA (as per the generic structure prescribed in Appendix-III of the EIA Notification, 2006) covering the above mentioned issues, the proponent will get the public hearing conducted and take further necessary action for obtaining environmental clearance in accordance with the procedure prescribed under the EIA Notification, 2006.

(Dr. Saroj)
Director

Copy to:

1). The Secretary, Ministry of Mines, Government of India, Shastri Bhawan, New Delhi.
2). The Secretary, Department of Mines & Geology, Government of Rajasthan Secretariat, Jaipur.
3). The Secretary, Department of Environment, Government of Rajasthan, Secretariat, Jaipur.
5). The Member Secretary, Rajasthan State Pollution Control Board, 4, Institutional area, Jhalana, Doongri, Jaipur.
6). The Member Secretary, Central Ground Water Authority, A2, W- 3 Curzon Road Barracks, K.G. Marg, New Delhi-110001.
7). The Controller General, Indian Bureau of Mines, Indira Bhavan, Civil Lines, Nagpur - 440 001
8). The District Collector, Rajsamand District, Government of Rajasthan.
9). Guard File.
10). MoEF website.

(Dr. Saroj)
Director
राजस्थान सरकार
खान (सं.2) विभाग

क्रमांक प.10(3)खान / मुं-2 / 2013

जमुन, दिनांक-- F 5 MAR 2013

लेखन पद्ने क्षेत्र 773.2797 हैं। क्षेत्र जिला राजस्थान की तहसील नाथद्वारा की राजधानी गावों में कैप वैक्टर नदी, नालो, बालों से (खाद्यरी के अनुसार) निकलने वाले खानिज बजरू का श्री हिमंत सिंह गुरु श्री कल्याण बियर नाथद्वार, 98, रुपस्रत टाउनशिप, फेस-11, पाल रोड, जोधपुर (राज.)

उपरोक्त विषय से राजस्थान खानिज रिसर्च निगम, 1996 के अनुसार राज्य सरकार आयोजन 773.2797 इंटरपर क्षेत्र के लिए खानिज बजरू का लेखन पद्ना 5 वर्ष के लिए जारी की जाने की संभावना है। उत्तर: निम्न पूर्वितियां एक वर्ष में पूर्ण करें

1. नाहिंलाई द्वारा कर्ता एवं स्कृमम अधिकारी से अनुमोदित करा प्रस्तुत करें
2. पर्यावरण व्यापकता माध्यम सरकार के लिए पर्यावरण मंत्रालय से प्राप्त कर प्रस्तुत करें
3. नियम 37(1) अनुसार वित्तीय आवस्था प्रस्तुत करें

अब्दूर
संयुक्त शासन सभित

प्रतिकी-निर्माण, खान एवं भू-विज्ञान निवास, जिला जमुन, दिनांक 18.01.2013 के क्रम में आवड़क कार्यालय हेतु प्रस्तुत है।
### LIST OF VILLAGES WITH KHASRA NOs.

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<td>217/128</td>
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<td>218/128</td>
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<tr>
<td></td>
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<tr>
<td>9</td>
<td>सागर</td>
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<td>Sr. No.</td>
<td>Village Name</td>
<td>Population</td>
<td>Critic Value</td>
<td>Total Value</td>
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<tr>
<td>---------</td>
<td>--------------</td>
<td>------------</td>
<td>--------------</td>
<td>-------------</td>
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<td>Gudla (Ghodla)</td>
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<td>13</td>
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<td>19</td>
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<td>231</td>
<td>7=02</td>
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<td>20</td>
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<td>16=07</td>
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<td>23</td>
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<td>26</td>
<td>Chhoti Chapu</td>
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</tr>
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</table>
GOVERNMENT OF RAJASTHAN
OFFICE OF THE SUPERINTENDING MINING ENGINEER, RAJSAMAND - CIRCLE
DEPARTMENT OF MINES & GEOLOGY, RAJSAMAND (RAJ)

PHONE – (01952) 220190

D/597

SH. HIMMAT SINGH SHEKHAWAT
98, Roopnajat Township,
Phase-II, Jodhpur Road, Jodhpur (Raj.)

Sub – Approval of Mining Plan with Progressive Mine Closure Plan in respect of your Mining Lease for Mineral Baji ML No. 01/2013, lease Area 773.2797 Hects At Tehsil Nathdwara Distt. Rajsamand (Raj.) submitted under Rule 37 E of RMMCR, 1986 (Amended-2012).

Dear Sir,

In exercise of powers conferred by Rule 37B/37G of RMMCR 1986 and with Government of Rajasthan vide Notification No. F-14(1)/Min/Gr.II/2011 Jaipur dated 24-7-2012 I hereby APPROVE the above said Mining Plan with Progressive Mine Closure Plan. This approval is subject to the following conditions:

1. The Mining Plan with Progressive Mine Closure Plan is approved without prejudice to any other laws applicable to the mine/area from time to time whether made by the Central Government, State Government or any other authority.


3. It is further clarified that approval of the Mining Plan with Progressive Mine Closure Plan is subject to the provisions of Forest (conservation) Act 1980, Forest (Conservation) Rules, 1981 and other relevant statutes, orders and guidelines as may be applicable to the lease from time to time.

4. The Mining Plan with Progressive Mine Closure Plan is approved without prejudice to any order or direction from any court of competent jurisdiction.

5. The approval of proposed mining operation and associated activities is restricted to the mining lease area only.

6. The execution of Mining Plan with Progressive Mine Closure Plan shall be subjected to vacation of prohibitory orders/notices, if any.

7. If anything found concealed as required by the Mines Act/Rules, in the contents of the Mining Plan with Progressive Mine Closure Plan and the proposal for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect.

8. At any stage, if it is observed that the information furnished in the document are incorrect or misrepresent facts, the approval of the document shall be revoked with immediate effect.

9. The lease/applicant should deposit financial assurance to the concerned Mining Engineer/ Assistant Mining Engineer as required under Rule 37 J of the Rajasthan Minor Mineral Concession 1986.

Two Copies of the approved Mining Plan with Progressive Mine Closure Plan are being sent to your RQP as advised in consent letter.

Yours Faithfully,

(N.K. RAIRWA)
Suprdg. Mining Engineer
Department of Mines & Geology
Rajsamand - Circle, Rajasamand (Raj.)
<table>
<thead>
<tr>
<th>क्र.सं.</th>
<th>गांव का नाम</th>
<th>खसरा संख्या</th>
<th>क्षेत्रफल (बीघा)</th>
<th>कुल क्षेत्रफल (बीघा)</th>
</tr>
</thead>
<tbody>
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<td></td>
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<td></td>
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<td></td>
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<td>0=09</td>
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<tr>
<td></td>
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<td>5020</td>
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<td></td>
</tr>
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</table>

कुल क्षेत्रफल = 3057 बीघा 13 बिस्वा ।
या = 773.2797 हेक्टेयर।

उपलब्धिता,
राजस्थान खण्ड द्वितीय।
नोक आरावली हिल

राजस्थान सरकार
कार्यालय ठाकूर नाथाला, राजस्थान खान्ड द्वितीय
शासन भवन, अड्डे कर्ना को विभागकारी न्यायालय से हाल, भाजपाहर शेख, राजस्थान

शासनशाली-८०-६२६, फोन-६२७५-०१०१, फैक्स-६२७५-२१०१, इमेल-रासभांड-राजस्थान@y-a.org

कार्यक्रम- अ/ह नोक कार्यालय आवेदन पत्र दसवीं बारी केसरवाल ७७३.२७४७ वर्ग
तहसील गायनूर जिला राजस्थान के तहत सेट में बाजी बाज।

(संबंधित- आवेदन पत्र दिनांक २३.०७.२०१४ के क्रम में)

महत्दयः

आवेदक निर्देशन अनुसार प्रावधानः पत्र में लेख है कि अभी तक आवेदक
कार्यालय आवेदन पत्र के लिए बारी केसरवाल ७७३.२७४७ तहसील गायनूर जिला राजस्थान
दौड़ी निर्देशक खाना एवं भवानिय विभाग जिला गायनूर के पत्र दिनांक २८ दिसंबर ०९.०१.०५
के उपरांत आवेदक केसर आवेदित हिस्ट डेट में नहीं आता है।

ठाकूर नाथाला,
राजस्थान खान्ड-द्वितीय
ENVIRONMENTAL POLICY

The Environmental policy and its objectives have been approved by Board of Directors on 11.01.2015 and copy of Board minutes enclosed as Annexure-10

**Policy:**

“To be a role model in protection of environment for sustainable development, Company is committed to implement the best global practices in all its operations through prevention / mitigation of pollution and bringing awareness among all the stakeholders for continual improvement in environmental performance”

**Objectives:**

- To take account of environment concerns in planning and decision-making.
- Compliance of conditions imposed in Environmental Clearance, CTE, CTO and other statutory clearances issued by regulatory agencies.
- To monitor and measure environment parameters in order to assess and analyze the level and to control them to conform or improve in accordance with environment policy and objectives.
- To evolve significant environment aspects and environment management programme for continuous improvement.
  - Identification of significant impacts and preparation of environment management systems for implementation at mines
- Optimum utilization of resources
- To take up developmental works in surrounding villages as a part of corporate social responsibility (CSR)
  - Monitoring & Maintenance of plantation development.
- To provide appropriate training and disseminate information to enable all the employees to accept individual responsibility for environment protection, implement best practices and work in partnership to create a culture of continual improvement.

The Environmental Policy, objectives and guidelines will be display of the same at the conspicuous places for bringing awareness among the employees of Sand Mining.

Authorized Signatory
Non-Compliance Reporting System
1. In case of any Violation of any environmental Norms, case will be put to the higher authority of the company.
2. Environmental Monitoring i.e Air, Water Noise will be conveyed to respective person/Laboratory for taking up necessary corrective action.
PROFORMA FOR ENVIRONMENTAL APPRAISAL OF MINING PROJECTS
(MINING SECTOR PROJECTS)

1. General Information
Name of the project : Proposed River Sand Mining area at Revenue villages of Tehsil Nathdwara & District- Rajsamand
(a) Name of the proponent : Mr. Himmat Singh Shekhawat
Mailing Address : 98, Roop Rajat Township,
Phase 11, Pal road, Jodhpur (Raj)
E-mail : s-c-i-l@hotmail.com,ecipl2015@gmail.com
Telephone : 9314481827
Fax No. : --
Objective of the project : River Sand Mining at revenue villages of Tehsil Nathdwara & District- Rajsamand

(b) Location of mine (s)

<table>
<thead>
<tr>
<th>Village(s)</th>
<th>Tehsil</th>
<th>District</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>Nathdwara</td>
<td>Rajsamand</td>
<td>Rajasthan</td>
</tr>
</tbody>
</table>

(d) Does the proposal relate to
(i) New mine : Yes ✓ No
(ii) Expansion : Yes ✓ No
• Increase in ML area : Yes ✓ No
• Increase in annual production : Yes ✓ No
(iii) Renewal of ML  
<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

(iv) Modernization
<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

(e) Site Information

(i) Geographical Location
- Latitude: 24°54'48.6" N to 25°01'12.9"N
- Longitude: 73°37'18.9" E to 73°56'09.7"E
- Survey of India Topo sheet number: 45H/9, 45 H/13, 45G/12, 45 G/16
- Elevation above Mean Sea Level: 635-512 AMSL
- Total mining lease area (in ha.): 773.2797 Ha

(ii) Dominant nature of terrain
- Flat  
<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>
- Undulated  
  | Yes | No |
  |     | ✓  |
- Hilly  
  | Yes | No |
  |     | ✓  |

2. Land usage of the mining lease area (in ha.)

(a) Agricultural  
| Nil |

(b) Forest  
| Nil |

(c) Waste land  
| Nil |

(d) Grazing  
| Nil |

(e) Surface water bodies  
| Nil |

(f) Others (Specify) River Bed Area  
| 773.2797 Ha |

Total  
| 773.2797 Ha |
3. **Indicate the seismic zone in which ML area falls. In case of zone IV & V, details of earthquakes in last 10 years.**

**Seismic Zone -II**

(a) **Severity (Richter scale)**

(b) **Impact i.e. Damage to**

- Life: Yes [ ] No [ √ ]
- Property: Yes [ ] No [ √ ]
- Existing mine: Yes [ ] No [ √ ]

4. **Break-up of mining lease area (in ha.) as per approved conceptual plan:**

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Mining Lease Area</th>
<th>Total</th>
<th>Area acquired</th>
<th>Area to be acquired</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Government</td>
<td>Private</td>
<td>Forest</td>
<td>Others</td>
</tr>
<tr>
<td>1. Area to be excavated</td>
<td>Nil</td>
<td>773.27</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>2. Storage for top soil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>3. Overburden / Dumps</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>4. Mineral storage</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>5. Infrastructure (Workshop, Administrative Building)</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>6. Roads</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>7. Railways</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>8. Green Belt</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>9. Tailings pond</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>10. Effluent treatment plant</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>11. Coal handling plant / mineral separation plant</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>12. Township area</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>13. Other (Specify)</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
</tbody>
</table>
5. Township (outside mining lease) - Not Applicable
   (a) Total area (in ha) Not Applicable
   (b) No. of dwelling units Not Applicable
   (c) Distance from mine site Not Applicable

6. Distance of water bodies (in km)

<table>
<thead>
<tr>
<th>Distance from</th>
<th>River Bank *</th>
<th>Other Water bodies *</th>
<th>Sea / creek / lake / nalla etc. (specify)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mining lease boundary</td>
<td>Lease area is itself river bed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ancillary facilities</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
</tbody>
</table>

[* From highest flood line / high tide line]

7. For projects falling within the Coastal Regulation Zone (CRZ)

Whether the mineral to be mined is of rare nature and not available outside CRZ? Yes ☐ No ☑

If yes, annex a scaled location map showing low tide line (LTL), high tide line (HTL) duly demarcated by one of the authorized agencies* [ *Director, Space Application Centre, Ahmedabad; Centre for Earth Sciences Studies, Thiruvananthapuram; Institute of Remote Sensing, Anna University, Chennai; Institute of Wetland Management & Ecological Designs, Kolkata; Naval Hydrographers’s Office, Dehradun; National Institute of Oceanography, Panaji, Goa; and National Institute of Ocean Technology, Chennai], boundary of mining lease area, distance of ML area from LTL and HTL CRZ boundary and CRZ classification of the project area as per the approved Coastal Zone Management Plan, and settlements, sand dunes, mangroves, forest landpatches, turtles breeding and nesting sites etc., if any, in the project area.

8. Indicate aerial distance from the periphery of core zone / area from the periphery of the buffer zone to the boundary of following (up to 10 km):

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Areas</th>
<th>Name</th>
<th>Aerial distance (in km.) from Core Zone</th>
<th>Buffer Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>National Park / Sanctuary</td>
<td>Nil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Biosphere Reserve / Tiger Reserve / Elephant Reserve / any other Reserve</td>
<td>Nil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Forest (RF / PF / unclassified)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Habitat for migratory birds</td>
<td>Nil</td>
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<td></td>
</tr>
<tr>
<td>5.</td>
<td>Corridor for animals of schedule I &amp; II of the Wildlife (Protection) Act, 1972</td>
<td>Nil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Archaeological sites * Notified</td>
<td>Nil</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>* Others</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Defense Installation</td>
<td>Nil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Industries / Thermal Power Plants</td>
<td>There is one industry named J.K. Tyre in</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
9. Other Mines
There are many marble mines in study area.

10. Airport
Nil

11. Railway Lines
Nil

12. National / State Highways
Nil

[* Buffer zone in case of ML area up to 25 ha. is to be considered as 5 km all around the periphery of the core zone and for ML area above 25 ha. an area 10 km all around the periphery of the core zone].

9. **Description of flora & fauna separately in the core and buffer zones.*

[* Consult the Wildlife (Protection) Act, 1972 as amended subsequently and list species with (1) Common name (2) Scientific name and (3) under which schedule of the Wildlife (Protection) Act the identified species fall. Get the list authenticated by an Expert in the field / credible scientific institute / University / Chief Wildlife Warden Office. **Information to be based on field survey.**]

<table>
<thead>
<tr>
<th>A. Flora</th>
<th>Core Zone</th>
<th>Buffer Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Agricultural crops</td>
<td>Maize, Barley &amp; Jawar</td>
<td>Wheat, Maize, Barley, Jawar &amp; Bazra etc.</td>
</tr>
<tr>
<td>2. Commercial crops</td>
<td>none</td>
<td>Mustered, Onion, Moong, Soya bean, Cotton &amp; Garlic etc</td>
</tr>
<tr>
<td>3. Plantation</td>
<td>Neem, Keekar, vilayti babol, Khejri etc.</td>
<td>Neem keekar vilalayti bobool aam jamoon, peepal bargad etc.</td>
</tr>
<tr>
<td>4. Natural vegetation / forest type</td>
<td>None</td>
<td>Scattered trees and small bushes seen.</td>
</tr>
<tr>
<td>5. Grass lands</td>
<td>None</td>
<td>Seasonal grass after rainy season</td>
</tr>
<tr>
<td>6. Endangered species</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>7. Endemic species</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>8. Others (Specify)</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. Fauna</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Total listing of faunal elements</td>
<td>12</td>
</tr>
<tr>
<td>2. Endangered species</td>
<td>0</td>
</tr>
<tr>
<td>3. Endemic species</td>
<td>Nil</td>
</tr>
<tr>
<td>4. Migratory species</td>
<td>Nil</td>
</tr>
<tr>
<td>5. Details of aquatic fauna, if applicable</td>
<td>Nil</td>
</tr>
</tbody>
</table>

10. **Details of mineral reserves (as per approved Mining Plan)**

| (a) Proved | 32477340 Tonnes |
| (b) Indicated | --- |
| (c) Inferred | ---- |
| (d) Mineable reserves | 30227820 Tonnes |
11. Major geological formation / disturbances in the mining lease area

(a) Geological maps submitted  Yes  No
(b) Geological sections submitted  Yes  No
(c) Contour map submitted  Yes  No
(d) Whether the presence, if any, noted of
   (i) Faults  Yes  No
   (ii) Dykes  Yes  No
   (iii) Shear Zone  Yes  No
   (iv) Folds  Yes  No
   (v) Other weak zones  Yes  No
(e) Source of data (Indicate)

12. Production of mineral(s) and life of mine

(a) Rated capacity of mine mineral wise (Tonnes / annum)  2.81LTPA
(b) Life of mine at proposed capacity (Years)  Forever
(c) Lease period (Years)  5 Years
(d) Date of expiry of lease (D /M /Y)  LOI Granted, Lease is yet to be granted.
(e) Indicate in case of existing mines
   (i) Date of opening of mine  --
   (ii) Production in the last 5 years from year……… to year ………
       in million tonnes.  Nil  Nil
   (iii) Projected production for the next 6th to 10th year
        5 years from year 2013 to year 2018 in million tonnes.
   (iv) Whether mining was suspended after opening of the mine?  Yes  No
       If yes, details thereof including last production figure and reason for the same.
(f) Whether plans & sections provided?  Yes  No
13. **Type and method of mining operations**

<table>
<thead>
<tr>
<th>TYPE</th>
<th>METHOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opencast</td>
<td>Manual</td>
</tr>
<tr>
<td>Underground</td>
<td>Semi-mechanised</td>
</tr>
<tr>
<td>Both</td>
<td>Mechanised</td>
</tr>
</tbody>
</table>

14. **Details of ancillary operations for mineral processing**

(a) Existing

(b) Additional

15. **Mine details**

(a) **Opencast mine**

(i) Stripping ratio (mineral in tonnes to over burden in m$^3$) 

(ii) Ultimate working depth (in m bgl)

(iii) Indicate present working depth in case of existing mine (in m bgl)

(iv) Thickness of top soil (in m.)

- Minimum
- Maximum
- Average

(v) Thickness of overburden (in m.)

- Minimum
- Maximum
- Average

(vi) **Mining Plan**

- Height and width of the bench in Overburden / waste.
- Height & width of the bench in ore body / coal seam.
- Proposed inclination / slope of the sides of the opencast mine (separately for overburden, coal / ore and overall slope of the pit sides) both while operating the mine as well as at the time of closure of the mine.
- Whether transverse sections across the opencast mine at the end of fifth year and at the end of the life of the mine have been submitted?

(vii) Type of blasting, if any, to be adopted. Not Applicable

(b) **Underground mine**

(i) Seam / Ore body Min. Depth (m) Max. Depth (m) Avg. thickness (m)

<table>
<thead>
<tr>
<th>Rate of dip in degree</th>
<th>Direction of dip</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(ii) Mode of entry into the mine: Not Applicable

- Shaft
- Adit
- Incline

(iii) Details of machinery: Not Applicable

<table>
<thead>
<tr>
<th></th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>On surface</td>
<td></td>
</tr>
<tr>
<td>At Face</td>
<td></td>
</tr>
<tr>
<td>For transportation</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td></td>
</tr>
</tbody>
</table>

(iv) Method of stopping (metalliferrous mines)

- Open
- Filled
- Shrinkage
- Caving
- Combination of above
• Others (Specify)

(v) Extraction method

• Caving
• Stowing
• Partial extraction

(vi) Subsidence

• Predicted max. subsidence (in m)
• Max. value of tensile strain (in mm/m)
• Max. slope change (in mm/m)
• Whether identified possible subsidence area(s) superimposed on Surface Plan has been submitted?

Major impacts on surface features like natural drainage pattern, houses, buildings, water bodies, roads, forest, etc.

• Salient features of subsidence management (monitoring and control).

16. Surface drainage pattern at mine site

(a) Whether the pre-mining surface drainage plan submitted?

(b) Do you propose any modification / diversion in the existing natural drainage pattern at any stage? If yes, when. Provide location map indicating contours, dimensions of water body to be diverted, direction of flow of water and proposed route / changes, if any i.e. realignment of river / nallah / any other water body falling within core zone and its impact.

17. Embankment and / or weir construction

(a) Do you propose, at any stage, construction of

(i) Embankment for protection against flood?  
(ii) Weir for water storage for the mine?
(b) If so, provide details thereof.

(a) Impact of embankment on HFL and settlement around

(d) Impact of weir on down stream users of water.

18. **Vehicular traffic density** (outside the ML area)

<table>
<thead>
<tr>
<th>Type of vehicles</th>
<th>No. of vehicles per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Truck, Tractor</td>
<td>395</td>
</tr>
<tr>
<td>Truck, Tractor</td>
<td>430</td>
</tr>
</tbody>
</table>

(c) Whether the existing road network is adequate?
If no, provide details of alternative proposal?

19. **Loading, transportation and unloading of mineral and waste rocks on surface:**

<table>
<thead>
<tr>
<th>Type of transport</th>
<th>Manual</th>
<th>Tubs, mine cars, etc.</th>
<th>Scraper, shovels, dumpers / trucks.</th>
<th>Conveyors (belt, chain, etc.)</th>
<th>Others (specify)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qty.</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Percentage (%)</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Length (in km)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

20. **Mineral(s) transportation outside the ML area**

<table>
<thead>
<tr>
<th>Mode of transport</th>
<th>Qty. (in TPD)</th>
<th>Percentage (%)</th>
<th>Length (in km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road</td>
<td>1000</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Rail</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Conveyors</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Rope way</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Water ways</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Pipeline</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Others (Specify)</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1000</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

21. **Baseline Meteorological and Air Quality data**

(a) Micro-meteorological data
[Continuous monitoring through autographic instrument for one full season other than monsoon]

(i) Wind rose pattern for one full season (16 points of compass i.e. N, NNE, NE, - --) based on 24-hourly data. For coastal area also furnish day-time and night time data.

- Day time
- Night time
- 24 – hours period
(ii) Site specific monitored data

<table>
<thead>
<tr>
<th>Month</th>
<th>Wind Speed (kmph)</th>
<th>Temperature (°C)</th>
<th>Relative Humidity (%)</th>
<th>Rain Fall * (mm)</th>
<th>Cloud Cover** (Octas of sky)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct.2013</td>
<td>6.6</td>
<td>24.5</td>
<td>34.53</td>
<td>0.0</td>
<td>7</td>
</tr>
<tr>
<td>Nov.2013</td>
<td>6.1</td>
<td>20.3</td>
<td>31.72</td>
<td>0.0</td>
<td>4</td>
</tr>
<tr>
<td>Dec.2013</td>
<td>5.5</td>
<td>18.2</td>
<td>29.45</td>
<td>0.0</td>
<td>3</td>
</tr>
</tbody>
</table>

* 24-hours rainfall should be reported from 08:30 hrs. IST of previous day to 08:30 hrs. IST of the day.
* Rainy day is considered when 24 hrs. rainfall is ≥ 2.5 mm.
** Visual observations of cloud cover should be recorded four times a day at regular intervals.

(iii) Indicate name and distance of the nearest IMD meteorological station from which climatological data have been obtained for reporting in the EIA report, if any. Nearest IMD Station Dabok, Udaipur 40 Km.

(b) Ambient air quality data* (RPM, SPM, SO\textsubscript{2}, and NO\textsubscript{2})

[*Monitoring should be carried out covering one full season except monsoon – same season as in 21 (a) (i)]

[**Frequency of sampling: Sampling to be done twice a week for the entire season 24 hourly for SPM & RPM. For gaseous pollutants 24-hourly data be given irrespective of the sampling period.]

(i) Season and period for which monitoring has been carried out.
(ii) No. of samples collected at each monitoring station

<table>
<thead>
<tr>
<th>Name of monitoring equipment used</th>
<th>PM10</th>
<th>SO\textsubscript{2}</th>
<th>NO\textsubscript{2}</th>
<th>CO</th>
</tr>
</thead>
<tbody>
<tr>
<td>RDS</td>
<td></td>
<td></td>
<td></td>
<td>By Electro Chemical Sensor</td>
</tr>
<tr>
<td>Equipment sensitivity</td>
<td>5 to 1000 µg/m\textsuperscript{3}</td>
<td>6.0 to 100 µg/m\textsuperscript{3}</td>
<td>1-100 mg/m\textsuperscript{3}</td>
<td></td>
</tr>
</tbody>
</table>
### Permissible AAQ Standard (CPCB)

<table>
<thead>
<tr>
<th>Category (R, I, S)</th>
<th>Min.</th>
<th>Max.</th>
<th>95% tile</th>
<th>Min.</th>
<th>Max.</th>
<th>95% tile</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>100 µg/m³</td>
<td>80 µg/m³</td>
<td>80 µg/m³</td>
<td>2.0 mg/m³</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>100 µg/m³</td>
<td>80 µg/m³</td>
<td>80 µg/m³</td>
<td>2.0 mg/m³</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>100 µg/m³</td>
<td>80 µg/m³</td>
<td>80 µg/m³</td>
<td>2.0 mg/m³</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Monitoring Location

<table>
<thead>
<tr>
<th>Location</th>
<th>No. of Samples Drawn</th>
<th>Category* (R, I, S)</th>
<th>Min.</th>
<th>Max.</th>
<th>95% tile</th>
<th>Min.</th>
<th>Max.</th>
<th>95% tile</th>
<th>Min.</th>
<th>Max.</th>
<th>95% tile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core zone (Not in River Bed) CA₁</td>
<td>24</td>
<td>R</td>
<td>66.97</td>
<td>78.56</td>
<td>74.63</td>
<td>7.65</td>
<td>11.01</td>
<td>10.45</td>
<td>19</td>
<td>23.54</td>
<td>22.36</td>
</tr>
<tr>
<td>CA₂</td>
<td>24</td>
<td>R</td>
<td>68.76</td>
<td>80</td>
<td>76.0</td>
<td>6.24</td>
<td>15.0</td>
<td>14.25</td>
<td>14.4</td>
<td>23.65</td>
<td>22.46</td>
</tr>
<tr>
<td>Buffer zone BA₁</td>
<td>24</td>
<td>R</td>
<td>68.32</td>
<td>75.84</td>
<td>72.04</td>
<td>8.0</td>
<td>11.74</td>
<td>11.15</td>
<td>17.3</td>
<td>22.89</td>
<td>21.74</td>
</tr>
<tr>
<td>BA₂</td>
<td>24</td>
<td>R</td>
<td>69.98</td>
<td>80</td>
<td>76.0</td>
<td>8.67</td>
<td>13.0</td>
<td>12.35</td>
<td>15.8</td>
<td>24.45</td>
<td>23.22</td>
</tr>
<tr>
<td>BA₃</td>
<td>24</td>
<td>R</td>
<td>61.65</td>
<td>80</td>
<td>76.0</td>
<td>6.14</td>
<td>12.76</td>
<td>12.12</td>
<td>18.7</td>
<td>24.6</td>
<td>23.37</td>
</tr>
<tr>
<td>BA₄</td>
<td>24</td>
<td>R</td>
<td>65.09</td>
<td>80</td>
<td>76.0</td>
<td>10.01</td>
<td>14.01</td>
<td>13.30</td>
<td>18</td>
<td>22.90</td>
<td>21.75</td>
</tr>
</tbody>
</table>

*R = Residential; I = Industrial; S = Sensitive

# Annex a location map indicating location of AAQ stations, their direction and distance with respect to project site.

(Location Map is attached as annex No.13)

22. **Stack and emission details, if any*** - There is no stack. This is a River sand Mining Project.

<table>
<thead>
<tr>
<th>Sl.</th>
<th>Process / unit of</th>
<th>Height of Internal Flue gas</th>
<th>Emission rate (kg/hr)</th>
<th>Heat</th>
<th>Exhaust / Flue gas</th>
</tr>
</thead>
</table>
**23. Details of fugitive emissions during mining operations** - NOT APPLICABLE  
Dust will be generated during Loading and transportation. Details regarding dust emission have been incorporated in REIA/EMP Report. River bed mining will be done in environmental friendly manner.


(a) Details of model(s) used for AQIP including grid size, terrain features, and input meteorological data-

-AERMOD 8.2 View Model

(b) Maximum incremental GLC values of pollutants based on prediction exercise

(in µg/m³)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Pollutants</th>
<th>Incremental Value</th>
<th>Ambient Air Quality</th>
<th>Resultant Air Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>PM₁₀</td>
<td>1.9</td>
<td>80.0</td>
<td>81.9</td>
</tr>
<tr>
<td>2**.</td>
<td>SO₂</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>3**.</td>
<td>NO₂</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
</tbody>
</table>

[* Question Number 22, 23 & 24 need not be filled-in for mines having ML area of 25 ha. or less.*]

[**Information on item no. 2 & 3 to be provided in cases with captive power generation of 500 KVA and above]
25. **Water requirement (m$^3$/day)**

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Avg. Demand</th>
<th>Peak Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Mine site</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Mine operation</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>2. Land reclamation</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>3. Green Belt &amp; Dust Suppression</td>
<td>3.0 KLD</td>
<td>---</td>
</tr>
<tr>
<td>4. Drinking</td>
<td>2.0 KLD</td>
<td>---</td>
</tr>
<tr>
<td>5. Beneficiation</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>6. Washeries</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>7. Fire Service</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>8. Others (specify)</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>B. Township</strong></td>
<td>Not Applicable</td>
<td></td>
</tr>
<tr>
<td>1. Green Belt</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>2. Domestic</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>3. Other (specify)</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>5 KLD</td>
<td>---</td>
</tr>
</tbody>
</table>

26. **Source of water supply***

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Source</th>
<th>m$^3$/day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>River (name)</td>
<td>---</td>
</tr>
<tr>
<td>2</td>
<td>Ground water</td>
<td>5 KLD (Tanker Water Supply)</td>
</tr>
<tr>
<td>3</td>
<td>Mine water (sump / pit)</td>
<td>---</td>
</tr>
<tr>
<td>4</td>
<td>Other surface water bodies (specify)</td>
<td>---</td>
</tr>
</tbody>
</table>

[*Annex a copy of sanction letter / permission from the concerned authority (Central Ground Water Authority in case of ground water abstraction is from notified area / State Ground Water Board in case of non-notified area / State Irrigation Department for surface water pumping) for drawing water.*]

27. **Lean season flow in case of pumping from river / nalla (cumecs)** Not Applicable

28. **Ground water potential of the study area**

28.1. **Ground water availability**

(a) Range of water table (m bgl)

(i) Pre-monsoon (April/May)

- Core Zone 12.10 m bgl
- Buffer zone 18.96 m bgl

(ii) Post-monsoon (November)

- Core Zone 7.45 m bgl
• Buffer zone

(b) Total annual replenishable recharge (million m$^3$/ year)

- By ground water table fluctuation method: Nil
- By rainfall infiltration factor method: Nil

(c) Annual draft excluding estimated draft through mine discharge (million m$^3$/ year)

28.5185

(d) Estimated draft through mine discharge (million m$^3$/ year)

Nil

(e) Net annual ground water availability (million m$^3$/ year)

20.34

(f) Stage of ground water development in %

140.17

28.2. Water demand - Competing users of the water source-

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Usage</th>
<th>Present Consumption (m$^3$/day)</th>
<th>Additional proposed as per local plan (m$^3$/day)</th>
<th>Total (m$^3$/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Surface</td>
<td>Ground</td>
<td>Surface</td>
</tr>
<tr>
<td>1</td>
<td>Domestic</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>2</td>
<td>Irrigation</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>3</td>
<td>Industry</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>4</td>
<td>Mining</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>5</td>
<td>Others (specify) (Plantation &amp; Dust Suppression)</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
</tbody>
</table>

29. Water quality*

- Physico-chemical analysis report of water is attached as Annex-8

(a) Annex physico-chemical analysis of water at intake point **

(b) In case of existing mine, annex report on quality of water discharge i.e. complete physico-chemical analysis**

[*For non-discharging mines at least four ground water samples to be taken preferably from downstream direction of the mine in pre-monsoon and post-monsoon periods and analysed. For discharging mines six samples are to be analysed]*

**All parameters as per BIS 10500. Indicate name of Methodology, Equipment used for analysis, and Detection Level (DL) for each parameter.
*** Wherever any analytical parameter is below detection level, “BDL” (Below Detection Level) should be written instead of ‘NIL’.

30. **Impact on ground water regime / stream / lake / springs due to mine dewatering**

   Not applicable

   (a) Radius of influence (in m)

   [To be estimated based on analysis of pumping test data and application of empirical formula]

   (b) Whether saline water ingress will take place?  

      Yes [ ] No [ ]

      (Applicable to coastal areas)

   (c) Impact on stream / lake / springs

      [* Provide a comprehensive hydro-geological assessment report if the average mine dewatering is more than 100 m³/day and or going below water table in non-monsoon period. The report should be based on preferably latest one year pre-monsoon and post-monsoon baseline data covering information on ground water situation, aquifer characteristics, water level conditions (April – May and November), estimate of ground water resources, predicted impact of the project on ground water regime and detailed remedial / conservation measures such as artificial recharge of ground water etc. The report should be based on actual field inventory out of existing wells, at least 30 observation wells in the buffer zone with supplementary information from secondary sources (mention name). For estimation** of ground water resource (refer question no. 28 above) be designated study area of the buffer zone may be subdivided into command and non-command areas, watershed-wise (in case of hard rock / consolidated formations) / block-wise / mandal-wise in case of alluvial / unconsolidated formations)]

      [**For estimating ground water resources in the area follow the Ground Water Estimation Committee recommendations of 1997]

31. **Waste Water Management- Not Applicable**

   **Mine**

   (a) Daily average discharge (m³/day) from different sources

   (i) Mine water discharge during

      • Lean period

      • Monsoon period

   (ii) Workshop

   (iii) Domestic (mine site)

   (iv) Beneficiation / Washeries

   (v) Coal Handling Plant

   (vi) Tailings pond

   (vii) Others (Specify)

   Total

   (b) Waste water treatment plant; flow

   Q-17
sheet for treatment process attached. Yes No

c) Quantity of water recycled / reused / to be recycled in
   (i) Percentage
   (ii) m³/day

d) Point of final discharge

<table>
<thead>
<tr>
<th>Final Point</th>
<th>Quantity discharged (in m³/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Surface</td>
<td></td>
</tr>
<tr>
<td>(i) Agricultural land</td>
<td></td>
</tr>
<tr>
<td>(ii) Waste land</td>
<td>----</td>
</tr>
<tr>
<td>(iii) Forest land</td>
<td></td>
</tr>
<tr>
<td>(iv) Green belt</td>
<td></td>
</tr>
<tr>
<td>2. River / nallah</td>
<td>----</td>
</tr>
<tr>
<td>3. Lake</td>
<td>----</td>
</tr>
<tr>
<td>4. Sea</td>
<td>----</td>
</tr>
<tr>
<td>5. Others (specify)</td>
<td>----</td>
</tr>
<tr>
<td>Total</td>
<td>----</td>
</tr>
</tbody>
</table>

e) Users of discharge water
   (i) Human Yes No ----
   (ii) Livestock Yes No ----
   (iii) Irrigation Yes No ----
   (iv) Industry Yes No ----
   (v) Others (specify) ----

f) Details of the river / nalla, if final effluent is / will be discharged (cumecs)

   (i) Average flow rate ----
   (ii) Lean season flow rate ----
   (iii) Aquatic life
   (iv) Analysis of river water 100 meters upstream and 100 meters downstream of discharge point submitted Yes No ----

Township

(a) Waste water generation from township (m³/day) ----
(b) Are you planning to provide sewage treatment plant? Yes [ ] No [ ]

(c) Usage of treated water

32. Attach water balance statement in the form of a flow diagram indicating source(s), consumption (Section-wise) and output.

Water Balance

- Total Water Demand 5 KLD
  - For Domestic Use 2 KLD
    - Domestic Waste 1 KLD
    - Discharge in Septic Tank / Soak pit
  - Dust Suppression/Plantation 3 KLD

33. Ambient noise level leq dB(A)

<table>
<thead>
<tr>
<th>Location of sampling station</th>
<th>Noise level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Day Time</td>
</tr>
<tr>
<td>Core Zone (Not in River Bed)</td>
<td></td>
</tr>
<tr>
<td>CN₁</td>
<td>47.6</td>
</tr>
<tr>
<td>CN₂</td>
<td>45.2</td>
</tr>
<tr>
<td>B. Buffer Zone</td>
<td></td>
</tr>
<tr>
<td>BN₁</td>
<td>51.8</td>
</tr>
<tr>
<td>BN₂</td>
<td>54.6</td>
</tr>
<tr>
<td>BN₃</td>
<td>47.7</td>
</tr>
<tr>
<td>BN₄</td>
<td>48.0</td>
</tr>
</tbody>
</table>

34. Solid Waste- Nil

(a) Top soil and Solid waste quantity and quality

<table>
<thead>
<tr>
<th>Name (Lump/fines/slurry/Sludge/others)</th>
<th>Composition</th>
<th>Quantity (m³/month)</th>
<th>Method of disposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mining activity*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Top Soil</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>b. Over burden</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>c. Others (specify)</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
</tbody>
</table>

Q-19
Effluent Treatment Plant (sludge)  

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[* Annex layout plan indicating the dump sites.]

(b) (i) Does waste (s) contain any hazardous/toxic substance/radioactive materials or heavy metals?  
Yes [ ] No [ ]

(ii) If yes, whether details and precautionary measures provided?  
Yes [ ] No [ ]

(c) Recovery and recycling possibilities.

(d) Possible user(s) of the solid waste.

(e) (i) Is the solid waste suitable for backfilling?  
Yes [ ] No [ ]

(ii) If yes, when do you propose to start backfilling.

<table>
<thead>
<tr>
<th>Solid waste (s)</th>
<th>Already accumulated (A)</th>
<th>To be generated (B)</th>
<th>% of A &amp; B to be backfilled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over burden</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>Others (specify)</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
</tbody>
</table>

(f) In case waste is to be dumped on the ground, indicate

(i) Associated environmental problems

(ii) Number & type of waste dumps

- No. of external dumps  
  ----
- Max. projected height of dumps (in m)  
  ----
- No. of terraces and height of each stage  
  ----
- Overall slope of the dump (degree)  
  ----
- Proposed reclamation measures

(iii) Section of the waste dump in relation to the adjacent ground profile attached.  
Yes [ ] No [ ]

---

35. **Fuel / Energy requirements**

[To be furnished for mines having ML area more than 25 ha. or captive power generation of 500KVA and above]  

* Not Applicable
(a) Total power requirement: Not Applicable (in MW)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Mine Site</th>
<th>Township</th>
<th>Others (specify)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Present</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Proposed / additional</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(b) Source of power: Not Applicable (in MW)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>SEB/Grid*</th>
<th>Captive power plant</th>
<th>DG Sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Present</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Propose</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[* Annex a copy of the sanction letter from the concerned authority]

(c) Details of fuels

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Fuel</th>
<th>Daily Consumption (TPD)</th>
<th>Calorific value (Kcals/kg)</th>
<th>% Ash</th>
<th>% Sulphur</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Existing</td>
<td>Proposed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>HSD</td>
<td>0.23</td>
<td>0.43</td>
<td>9840</td>
<td>0.01</td>
</tr>
<tr>
<td>2</td>
<td>LSHS</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>3</td>
<td>Other (specify)</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
</tbody>
</table>

36. Storage of inflammable / explosive materials- Not Applicable

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name</th>
<th>Number of Storages</th>
<th>Consumption (in TPD)</th>
<th>Maximum Quantity at any point of time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fuels</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>2</td>
<td>Explosives</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
</tbody>
</table>

37. Human Settlement-

<table>
<thead>
<tr>
<th></th>
<th>Core Zone</th>
<th>Buffer Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>Nil</td>
<td>195363</td>
</tr>
<tr>
<td>No. of villages</td>
<td>Nil</td>
<td>176</td>
</tr>
<tr>
<td>Number of households village-wise</td>
<td>Nil</td>
<td>Details Given in REIA/EMP Report</td>
</tr>
</tbody>
</table>

[* As per 2001 census record or actual survey]

38. Rehabilitation & Resettlement (R&R) Plan*- Not Applicable

[*Provide a comprehensive rehabilitation plan, if more than 1000 people are likely to be displaced, other-wise a summary plan]
(a) Villages falling within the study area

<table>
<thead>
<tr>
<th>Villages</th>
<th>Number</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core zone</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>500 m from the blasting site (s)</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Buffer zone</td>
<td>176</td>
<td>Details Given in EIA Report</td>
</tr>
<tr>
<td>Township site</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

(b) Details of village(s) in the core zone

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Village name</th>
<th>Population*</th>
<th>Average Annual Income</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Tribal</td>
<td>Others</td>
</tr>
<tr>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
</tbody>
</table>

[*As per 2001 census / actual survey]

(c) Population to be displaced and / or Land oustees-

<table>
<thead>
<tr>
<th>Name of village(s) falling within</th>
<th>Number of oustees</th>
<th>Land (only)</th>
<th>Homestead (only)</th>
<th>Land and Homestead (both)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mining Lease</td>
<td></td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Township Site</td>
<td></td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(d) Whether R&R package has been finalized?
- No
If yes, salient features of R&R plan for oustees.

(i) Site details where the people are proposed to be resettled & facilities existing / to be created.
(ii) Funds earmarked for compensation package.
(iii) Agency /Authority responsible for their resettlement.
(iv) Time of commencement of resettlement of Project Affected People (PAP).
(v) Period by which resettlement of PAP will...
be over.

39. **Lease-wise plantation details**

(a) Lease area (in ha.): 773.2797

<table>
<thead>
<tr>
<th>New mine</th>
<th>Existing mine</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) Area broken up</td>
<td>2.10</td>
</tr>
<tr>
<td>(ii) To be broken up</td>
<td>33.50</td>
</tr>
<tr>
<td>(iii) Area not to be broken-up</td>
<td></td>
</tr>
</tbody>
</table>

(b) Township area (in ha.)

(c) Area afforested and proposed (in ha.)

<table>
<thead>
<tr>
<th>Peripheral</th>
<th>Dumps</th>
<th>Roads</th>
<th>Township</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) Existing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(ii) Proposed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(d) No. and type of trees planted and proposed

(i) Existing

- **When plantation was started?** Month / Year

<table>
<thead>
<tr>
<th>No. of plant species planted</th>
<th>Number saplings (per ha.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Survival rate %

- Avg. height

(ii) Proposed

<table>
<thead>
<tr>
<th>No. of plant species to be planted</th>
<th>Number of saplings (per ha.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>800 Per Year</td>
<td></td>
</tr>
</tbody>
</table>

40. **Environmental health and safety**

(a) What major health and safety hazards are anticipated?

**People may affected by dust and noise pollution with accidental problems.**

(b) What provisions have been made/proposed to be made to conform to health and safety requirements?

**Frequently health check-up proposed as per mines safety rule and also providing adequate safety equipments i.e. helmet, mask & ear muffs etc.**

(c) In case of an existing mine-

<table>
<thead>
<tr>
<th>Comprehensive report on health status of the workers as under the Mines Act annexed.</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>
(ii) Mineralogical composition of RPM (dust)

- Free silica
- Chromium* (Total as well as Hexavalent)
- Lead**

[* Only for Chromite mines]
[**Only for Base Metal mines]

(d) Information on radiation protection measures, if applicable.

41. **Environmental Management Plan**

Salient features of environmental protection measures

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Environmental issues*</th>
<th>Already practiced, if applicable</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Air pollution</td>
<td>Not Applicable</td>
<td>Dust suppression will be done by water sprinkling. Dust masks will be provided to those who will work in dust prone areas. Ambient Air Quality monitoring will be carried out on regular intervals.</td>
</tr>
<tr>
<td>2</td>
<td>Water pollution</td>
<td>Not Applicable</td>
<td>Waste water will not be generated during mining operations as it involves only collection of sand. Ground Water will not be intersected during mining activities. Excavation will be carried out upto a maximum depth of 3 m from surface of bajri deposit and not less than one metre from the water level of the River channel whichever is earlier. No waste water will be generated from the mining activities. Septic tanks and soak pits will be provided for the disposal of domestic effluents.</td>
</tr>
<tr>
<td>3</td>
<td>Water conservation</td>
<td>Not Applicable</td>
<td>During monsoon, ground water will naturally recharge through seepage of rain water at some extent</td>
</tr>
<tr>
<td>4</td>
<td>Noise pollution</td>
<td>Not Applicable</td>
<td>Proper maintenance of machines on regular intervals. Ear Plugs will be provided to Mine workers.</td>
</tr>
<tr>
<td>5</td>
<td>Solid waste / Tailings</td>
<td>Not Applicable</td>
<td>No waste generated during life of mine so there is no mitigation or management measures are proposed.</td>
</tr>
<tr>
<td>6</td>
<td>Land degradation</td>
<td>Not Applicable</td>
<td>As the mining area is confined to river channel only no other land will disturbed due to mining.</td>
</tr>
<tr>
<td>7</td>
<td>Erosion &amp;</td>
<td>Not Applicable</td>
<td>The minerals will be mined out in a uniform way so that the river flow/course shall not get</td>
</tr>
</tbody>
</table>
Sediment disturbed. Mining will proceed along the river in the direction from downstream to upstream in each block. No mining will be done across the river-nalla. No mining will be done within 7.5 m from either side of river banks to maintain its protection. Mining will not be done in proximity of any bridge, culvert, embankment or any water works setup etc. Appropriate safety zone will be left.

<table>
<thead>
<tr>
<th></th>
<th>Top soil</th>
<th>Not Applicable</th>
<th>No top soil will be encountered during mining activity so no measures are proposed. All the material is directly marketable.</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.</td>
<td>Ground vibration</td>
<td>Not Applicable</td>
<td>No ground vibrations will be there as this is a riverbed mining project.</td>
</tr>
<tr>
<td>9.</td>
<td>Wildlife conservation</td>
<td>Not Applicable</td>
<td>Conservation plan has been prepared for Peafowl.</td>
</tr>
<tr>
<td>10.</td>
<td>Forest protection</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>11.</td>
<td>Others (specify)</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

[* As applicable]

42. **Compliance with environmental safeguards** (For existing units) - **Not Applicable**
   (a) Status of the compliance of conditions of Environmental clearance issued by MoEF, if any, enclosed. Yes ☐ No ☐ √
   (b) Status of the compliance of ‘Consent to Operate’ issued by SPCB, if any, enclosed. Yes ☐ No ☐
   (c) Latest ‘environmental statement’ enclosed. Yes ☐ No ☐

43. **Scoping of EIA**
   Whether environmental impact assessment of the project has been carried out by following scoping process? Yes ☑ No ☐
   If yes, a copy of scoping of EIA annexed. Yes ☑ No ☐

44. **Mine closure**
   (a) Have you planned mine closure? Yes ☑ No ☐
   (b) Submitted a conceptual mine closure plan. Yes ☑ No ☐
   (c) If yes, indicate estimated amount for implementing the same (in Rs. lakhs)

45. **Capital cost of the project (in Rs. Lakh)**
   68 Lac
(Based on latest estimate)

46. **Cost of environmental protection measures**

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Particulars</th>
<th>Frequency</th>
<th>Capital cost in Lac per year</th>
<th>Recurring cost in Lac per Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pollution Control Water Sprinkling</td>
<td>Regular</td>
<td>Nil</td>
<td>2.0 Lac</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Environmental Pollution Monitoring i.e Water, Air, Soil &amp; Noise etc.</td>
<td>Half Yearly</td>
<td>Nil</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Plantation including Maintenance</td>
<td>@ 800 Plant Per Year</td>
<td>Nil</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Budget for Conservation of Schedule 1st Fauna</td>
<td>Yearly</td>
<td>Nil</td>
<td>0.30 Lac</td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
<td>5</td>
<td>Others (specify)</td>
<td>Regular</td>
<td>Nil</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>I. Haul road and other roads repair and maintenance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>II. Wire fencing at plantation site</td>
<td>Nil</td>
<td>0.20</td>
<td>Nil</td>
</tr>
<tr>
<td></td>
<td>III. Rainwater Harvesting</td>
<td>Nil</td>
<td>1.0 Lac</td>
<td>0.50</td>
</tr>
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<td></td>
<td></td>
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<tr>
<td></td>
<td>Total (13.00 Lac )</td>
<td>Nil</td>
<td>3.50 Lac</td>
<td>9.50 Lac</td>
</tr>
</tbody>
</table>

**Total (13.0 Lac)**
## Public Hearing

(a) Date of Advertisement

(b) Newspapers in which the advertisement appeared

(c) Date of public hearing (DD/MM/YYYY)

(d) Public Hearing Panel chaired by & members present

(e) No. of people attended the public hearing meeting and number of people from the lease area.

<table>
<thead>
<tr>
<th>S. NO.</th>
<th>NAME &amp; ADDRESS OF THE PERSON</th>
<th>ISSUES RAISED IN BRIEF</th>
<th>COMMENTS OF THE PROponent</th>
<th>ACTION/BUDEGETARY PROVISION IF ANY</th>
</tr>
</thead>
</table>
| 1      | Harish Chand Shrimali Village: Balicha, Khamnor | He asked who will be starting this project Environment Department, Contractor or Administration. There is no plantation shall be carried out till date which 5% of royalty received for Environment. Who will be carried out plantation and monitoring and when will be started. It is said in the project that road will be made on river bank than it will be made on river bank or in nearby | Plantation of local species will be carried out along the road sides, in schools, on government land with the help of local administration and villagers under the programme of social forestry. Plantation will be carried out along the 7.5 meter of safety zone of River bed both side. Local species will be planted. Lease holder applied for Environmental clearance in MOEF &CC. All the developmental works will be started after the clearance from MoEF by the lease holder. Environmental monitoring works i.e. Air, Water Soil; Noise will be carried out after the environmental clearance. Health camps will be organized for the villagers for the same 50,000 per year will | 0.5 Lac per year for Plantation including Maintenance, wire fencing  
0.5 Lac per year for Medical Camps (eye camp, blood donation camp etc) under the Provision of CSR.  
Environmental Pollution Monitoring i.e Water, Air, Soil & Noise etc :4.30 Lac Per Year |
|   | 2 | Heera Singh  
Village Samala | What are the benefits of villagers by this sand mining project? Will be cost free Bajri provided them for their house constructions? |
|   |   |   | There is an economic and social development by any project in a village. There will be expenditure of Rs.4.60 lac under Corporate Social Responsibility (CSR) activity. Health camps will be organized for the villagers, proper facility of drinking water will be provided. Constructions of toilets in government and other schools. Employment will be provided to local villagers according to their qualifications. Preference will be given to local villagers. Apart of it indirect employment will be given to truck & Tractor drivers. If any person required royalty free bajari for any |
|   |   |   | 4.60 Lac per Year under CSR Programme. About 23 persons will be employed directly |
construction work than it will be provided on written permission of administration and mining department. If any person wants royalty free Bajri for any construction works in village like; house, temple etc than it will be provided on written permission of Village Sarpanch, administration and mining department (Rajsmand) it will be provided. There is no any provision of royalty free Bajri if administration wants than provides.

3 Jagdish Paliwal, Village : Semakhera

He appraised this River sand mining project. New employment will be generated due to the construction activities. He expresses his happiness.

<table>
<thead>
<tr>
<th>49. Whether the following approvals* (wherever applicable) have been obtained?</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) Site clearance from MoEF</td>
</tr>
<tr>
<td>(ii) ‘Consent for Establishment’ from the State Pollution Control Board</td>
</tr>
<tr>
<td>(iii) NOC from Atomic Mineral Division</td>
</tr>
<tr>
<td>(iv) Mining plan approval from IBM / Ministry of Coal (From DMG)</td>
</tr>
<tr>
<td>(v) In case of existing mines, mining scheme approval from IBM</td>
</tr>
<tr>
<td>(vi) Forestry clearance under FCA, 1980</td>
</tr>
</tbody>
</table>
(vii) NOC from Chief Controller of Explosives       Yes   No  

(viii) Commitment regarding availability / pumping of water from the concerned Authorities        Yes   No  

(ix) In case of ML area falling in notified areas of the Central Ground Water Authority, NOC from them.         Yes   No  

[* Annex copies of approvals and number them]

(Approved Mining Plan by DMG- Annex-18)

50. Was / is there any court case relating to the project or related activities? If so, provide details present status.  

No

Verification: The data and information given in this proforma are true to the best of my knowledge and belief.

Date: 30 Jan 2015

Signature of the applicant*

with

full name & address

Mr. Himmat Singh Shekhawat Place:

[ * Owner or his authorized signatory]

Given under the seal of organisation on behalf of whom the applicant is signing