ENVIRONMENT MANAGEMENT PLAN

1.1. INTRODUCTION

1. Environment Clearance is sought for extraction of Morrum at Khand No. 9/8 to 9/10, Village - Umarwal, Tehsil - Chail, District - Kaushambi, Uttar Pradesh.

2. Environment Clearance is required for new mining lease.

3. The Mining is proposed from the riverbed of Yamuna River.

4. Proposed mining lease area is : Sanctioned Lease Area is 18.0 ha

5. Letter of Intent issued in favour of project proponent by DM Kaushambi dated 22-Nov-2018 and directed project proponent to submit the EC of the project for finalizing the mining lease deed.

6. It has been proposed that approximately 2,70,000.000 cum/year minor mineral will be extracted for 5 years as per the following details:

Year	Production in cum
1st	2,70,000.000
2nd	2,70,000.000
3rd	2,70,000.000
4th	2,70,000.000
5th	2,70,000.000

6. The total cost of the project will be approx 1 Crore 40 lacs(excluding royalty).

7. The coordinates of the proposed project site are:

Sanctioned MLA

Plots/Points	Latitude	Longitude
A	25°18'15.96"N	81°33'39.03"E
B	25°18'25.48"N	81°33'52.36"E
C	25°18'15.78"N	81°33'0.57"E
D	25°18'6.14"N	81°33'47.12"E

8. The proposed project falls under item 1(a), category 'B*' (subcategory B2) as it does not attract General and Specific Condition as specified in Environment Notification, 2006, as amended in 2009 & 2016.

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Email: admin@dasindia.org

1.2 ENVIRONMENTAL & SOCIAL LEGAL POLICY AND INSTITUTIONAL FRAMEWORK

The EIA Notification of the MoEF, 14th September 2006 warrants environmental clearance from the MoEF for Mining of Minerals (section 1(a)). Apart from the EIA notification, the Government of India has laid out various policy guidelines, acts and regulations for protection of environment. Summary of relevant legal requirements considered for this project are tabulated below. The mining sector has separate set of legislations covering management, conservation, grant and operation of mining lease. In addition there are environmental/forest regulation, applicable to mining of minor minerals as prescribed by MoEF and CPCB.

Table 1: Acts and Legislations applicable to Mining projects

S.No.	Acts and Legislations	Year
1.	The Mines Act	1952
2.	The Mines and Mineral (development and Regulation) Act	1957
3.	Mines Rules	1955
4.	Mineral Concession Rules	1960
5.	Mineral Conservation and Development Rules	1988
6.	Granite Conservation and Development Rules	1999
7.	The Environment (Protection) Act, MoEF, CPCB	1986
8.	Notification on Environment Impact Assessment of Development projects (and amendments) (referred to as the Notification on Environmental Clearance) MoEF, CPCB	2006 2009
9.	Wildlife Protection Act, MoEF	1972
10.	The Forest (Conservation) Act, MoEF	1980
11.	Water (Prevention and Control of Pollution) Act (and subsequent amendments), CPCB	1974
12.	Air (Prevention and Control of Pollution) Act (and subsequent amendments), CPCB	1981
13.	National Resettlement and Rehabilitation Policy,	2007

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14.	Sustainable Sand/Morrum Mining Management Guidelines	2016

1.3 PROJECT TECHNOLOGY /PROCESS DESCRIPTION

The proposed project is to mine Morrum from river bed sustainably and scientifically. Mining operations will be opencast, semi-mechanised/OTFM (Other Than Fully Mechanized) using LEMM like bar scraper & loader. Along the river bed of Yamuna River over an area of 18.000 ha at 9/8 to 9/10 is proposed for mining. Following geo-scientific methods are proposed to carry out the activity:

1. Approximately 2,70,000.000 cum/year minor mineral will be extracted for 5 years.
2. No mining activity will be undertaken during the monsoon season. So the river bed material will be replenished during the monsoon season every year.
3. The mining activity will be restricted to daytime only in order to avoid environmental pollution or any accidental hazards.
4. Mining operations will be opencast, semi-mechanised/OTFM (Other Than Fully Mechanized) using light earth movers like bar scraper & loader.
5. During the lease period, the deposit will be worked from the top surface of the river bed to 2 m or 1 m of water level whichever is less.
6. The depth of mining in Riverbed will not exceed one meter or water level whichever is less.
7. No River Morrum mining is allowed in rainy season.
8. Ultimate working depth shall be up to 1.6434 m from Riverbed level and not less than one meter from the water level of the River channel whichever is reached earlier.
9. In River flood plain mining a buffer of 3 meter to be left from the River bank for mining.
10. In mining from agricultural field a buffer of 3 meter to be left from the adjacent field.
11. Mining shall be done in layers of 1-2 feet (0.6 meter) depth to avoid ponding effect and after first layer is excavated, the process will be repeated for the next layers.
12. To maintain safety and stability of Riverbanks i.e. 7.5 meter or 10% of the width of the River whichever is more will be left intact as no mining zone.
13. No blasting will required RBM.
14. Depending upon the location, thickness of Morrum, deposition, agricultural land/Riverbed, the method of mining may be manual to semi-mechanized i.e. bar scraping.

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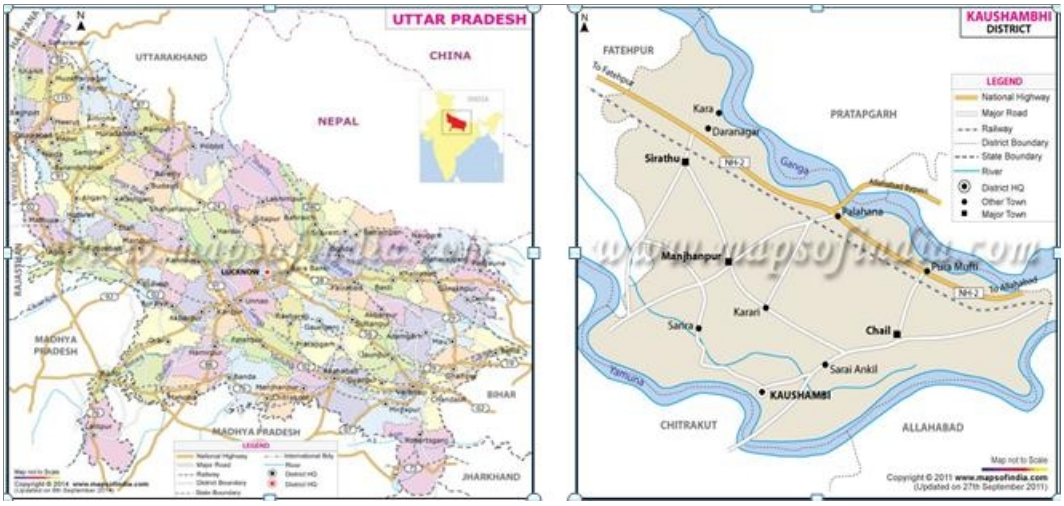

Figure 1: Map showing project location

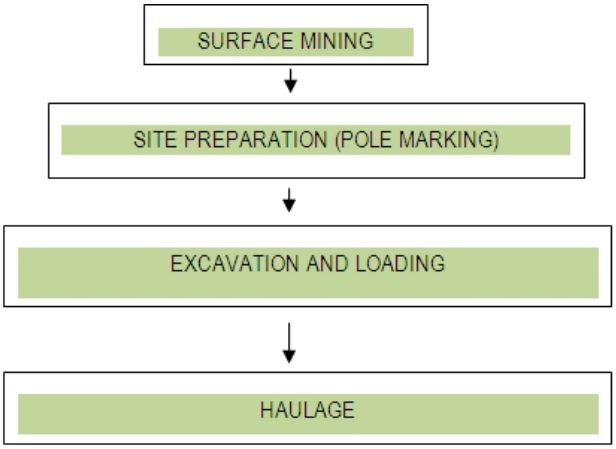

Figure 2: Mining Scheme for Proposed Project

1.4 ENVIRONMENT AND SOCIAL PROFILE (SECONDARY SOURCES)

1.4.1 Physical & Biological Environments

1.4.1.1 Climate

The oppressive dry summer in the characteristic of the district. The temperature may rise to 46 °C in May and June and fall to 9 °C in winter. The wet session normally starts in the end of June month. The average rainfall is 112 mm the winter months are virtually dry.

1.4.1.2 Rainfall and Humidity

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The average rainfall is 112 mm; the winter months are virtually dry. The climate of the area is characterized by general dryness except during the brief span of monsoon season. The rainy season spans over the period of mid June to September. The post-monsoon or the pre-winter extending from mid September to mid November follows this.

1.4.1.3 Geology and Physical Features

The study area is underlain by alluvial deposits of Pleistocene to Recent age. Of these Older Alluvium, believed to be Middle Pleistocene in age (Wadia, 1980) is not touched by highest flood level because it forms the high ground. The Newer Alluvium, which in general occupies the areas of lower altitude, is restricted to the present flood plains along river channels. The Older Alluvium belongs to Middle Pleistocene age while the Newer Alluvium belongs to upper Pleistocene to Recent age. The rocks of the Vindhyan system comprising shale and limestone form the basement. These rocks are overlain by laterite and mottled clay, which are succeeded by the Gangetic alluvium and top soil. The thick beds of limestone are present at a depth of about 220 m below land surface. Limestones are hard, grey, fine grained and chert like in appearance. Shales are present at a depth of about 180 m to 190 m below the land surface. Shales are greenish gray in colour, moderately hard and cleavable. Some of the shale were sandy in nature indicating probably the presence of laminae of sandy shale in shale bed. Laterite and mottled clays – (clays of red, orange, pink, and yellow colour) - occur as a distinct zone above the bed rock (Vindhyans). The clays of this group, which are deeply coloured, are distinct from the clays of the older alluvium, which are earthy brown or buff coloured. The mottled clays containing varying amounts of quartz, sand and lateritic gravel are hard to soft and plastic to gritty. Some times the mottled clays are ochreous in nature enclosing, occasionally, a core of ferruginous material. The Older Alluvium comprising clay, silt, sandy clay, fine to very coarse grained sand, gravel, a small proportion of pebbles, kanakar and indurated sand occur immediately above the laterite and mottled clay group.

1.4.1.5 Topography and Terrains

Kaushambi District is situated on the southern part of the State of Uttar Pradesh and surrounded by the district Allahabad in the east, Fatehpur in the west, Chitrakoot in the south and district Pratapgarh in north. The total geographical area of the district is 1903.17 Sq. Km. It is an old town situated on the northern bank of Yamuna, about 55 km west of Allahabad. Total land area of district lies in

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between the holy rivers Ganga in north and Yamuna in south and comprises of alluvial soil group having sandy and sandy loam soil. In its general aspect the district is a level plain without any hills. The only variations in the surface are caused by the uneven land along the streams that drain it. Depressions of varying depth and extent are found here and there, in which the surface drainage of the interior collects. No mineral deposit is available in Kaushambi except for Ordinary Sand/Morrum reported in some parts of the district. Ganga and Yamuna River are the main rivers flowing through Kaushambi District. The plain area of the district is situated in between Ganga and Yamuna River so these rivers play a very pivotal role in the agricultural development of the district. Kaushambi District has a moderate climate. Atmosphere of the district is pleasant. In the summer season weather is too hot and in the winter the weather is very cold. But in the rainy season the weather is good and pleasant. Soil of Kaushambi District is highly fertile.

1.4.1.6 Water Course & Hydrology

The study area is situated in the southeastern part of the Indo-Gangetic alluvium plain, and is more or less flat having a few conspicuous topographical features. The plains of the area have been formed by the sediments brought down by rivers of the Ganga and Yamuna system and deposited over undulating surface of the Vindhyans and suffered erosions to such an extent that it becomes peniplain. The plain area has slope from west to east. The area is situated in the drainage basin of the Yamuna and its tributary Kilanhigh and Sasur Khaderi rivers. These rivers are characterized by a slow tranquil flow wide flood plain and broad meander belts. The landforms observed in the alluvial plane are meander, point bars, back swamps . The altitude of the land surface varies between 88.69 m feet and 73.15 m above mean sea level.

1.4.1.6.1 Ground water quality

The ground water of the district is colourless, odourless and slightly alkaline in nature.

1.4.1.6.2 Status of ground water development

It has an average elevation of 90 metres. As per 2001 census, the district has a population of 1293154. It has 3 tehsils, 8 blocks and 885 villages. Average maximum and minimum temperatures are 46.7oC and 5.0oC respectively.The total wetland area in the district is 9485 ha. Major wetland

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types of the district are River/streams with 74per cent area. The other major types are Lakes/ponds (4.88%), and waterlogged-man made (6.0%). In addition there are 1068 small wetlands (<2.25 ha). Detailed estimates of wetlands in Kaushambi are given in table no.49.Area under aquatic vegetation in pre-monsoon season is 826 ha during post-monsoon season while in premonsoon season 316 ha. Water spread area in post-monsoon season is 4233ha. Where as in pre-monsoon season the water spread area is 3138 ha. Moderate turbidity is observed during post monsoon while high and moderate turbidity is observed during pre monsoon.

1.4.1.7 Cropping Pattern

The District Kaushambi is mainly a agricultural district in which the main crops are wheat and rice Some area is cultivated under pulses also like Arhar, Urad and Chana. The famous Allahabad variety of Guava is actually the speciality of Kaushambi. The principal sources of irrigation are canals and tubewells The area, production and productivity of the major crops in the district are summarized below in Table 2:

Table 2: Area, Production and Productivity of major crops cultivated in the district

S. No	Crop	Area (00,ha)	Production (Qt)	Productivity (Qt /ha)
1	Paddy	40533	640450	15.8
2	Jawar	7835	135750	17.33
3	Bajara	11593	139170	12.00
4	Maize	173	2490	14.39
5	Pigeon pea	11925	79730	6.69
6	Sesame	2011	4620	2.30
7	Groundnut	1063	6350	5.98
8	Urd	1240	6590	5.31
9	Moong	40	80	1.99
10	Coarse cereals	9	5	5.57
11	Wheat	63597	1322080	20.79
12	Barley	1063	1040	9.78
13	Gram	14516	144680	9.97
14	Mustard	1900	15400	8.11
15	Pea	660	6720	10.18
16	Toriya	887	709	7.99
17	Lintill	140	114	8.14
Total		**159185**	**2505978**	**162.32**

1.4.1.8 Socio-economic Environment

An official Census 2011 detail of Kaushambi, a district of Uttar Pradesh has been released by Directorate of Census Operations in Uttar Pradesh. Enumeration of key persons was also done by census officials in Kaushambi District of Uttar Pradesh.

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In 2011, Kaushambi had population of 1,599,596 of which male and female were 838,485 and 761,111 respectively. In 2001 census, Kaushambi had a population of 1,293,154 of which males were 682,290 and remaining 610,864 were females. Kaushambi District population constituted 0.80 percent of total Maharashtra population. In 2001 census, this figure for Kaushambi District was at 0.78 percent of Maharashtra population.

There was change of 23.70 percent in the population compared to population as per 2001. In the previous census of India 2001, Kaushambi District recorded increase of 26.46 percent to its population compared to 1991. The initial provisional data released by census India 2011, shows that density of Kaushambi district for 2011 is 899 people per sq. km. In 2001, Kaushambi district density was at 726 people per sq. km. Kaushambi district administers 1,779 square kilometers of areas. Average literacy rate of Kaushambi in 2011 were 61.28 compared to 46.88 of 2001. If things are looked out at gender wise, male and female literacy were 72.78 and 48.56 respectively. For 2001 census, same figures stood at 61.96 and 29.79 in Kaushambi District. Total literate in Kaushambi District were 813,424 of which male and female were 507,279 and 306,145 respectively. In 2001, Kaushambi District had 481,756 in its district. With regards to Sex Ratio in Kaushambi, it stood at 908 per 1000 male compared to 2001 census figure of 895. The average national sex ratio in India is 940 as per latest reports of Census 2011 Directorate. In 2011 census, child sex ratio is 923 girls per 1000 boys compared to figure of 946 girls per 1000 boys of 2001 census data.

In census enumeration, data regarding child under 0-6 age were also collected for all districts including Kaushambi. There were total 272,172 children under age of 0-6 against 265,503 of 2001 census. Of total 272,172 male and female were 141,512 and 130,660 respectively. Child Sex Ratio as per census 2011 was 923 compared to 946 of census 2001. In 2011, Children under 0-6 formed 17.02 percent of Kaushambi District compared to 20.53 percent of 2001. There was net change of -3.51 percent in this compared to previous census of India.

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Description	2011	2001
Actual Population	**1,599,596**	**1,293,154**
Male	838,485	682,290
Female	761,111	610,864
Population Growth	**23.70%**	**26.46%**
Area Sq. Km	1,779	1,779
Density/km2	**899**	**726**
Proportion to Uttar Pradesh Population	0.80%	0.78%
Sex Ratio (Per 1000)	**908**	**895**
Child Sex Ratio (0-6 Age)	923	946
Average Literacy	**61.28**	**46.88**
Male Literacy	72.78	61.96
Female Literacy	48.56	29.79
Total Child Population (0-6 Age)	**272,172**	**265,503**
Male Population (0-6 Age)	141,512	136,440
Female Population (0-6 Age)	130,660	129,063
Literates	**813,424**	**481,756**
Male Literates	507,279	338,208
Female Literates	306,145	143,548
Child Proportion (0-6 Age)	**17.02%**	**20.53%**

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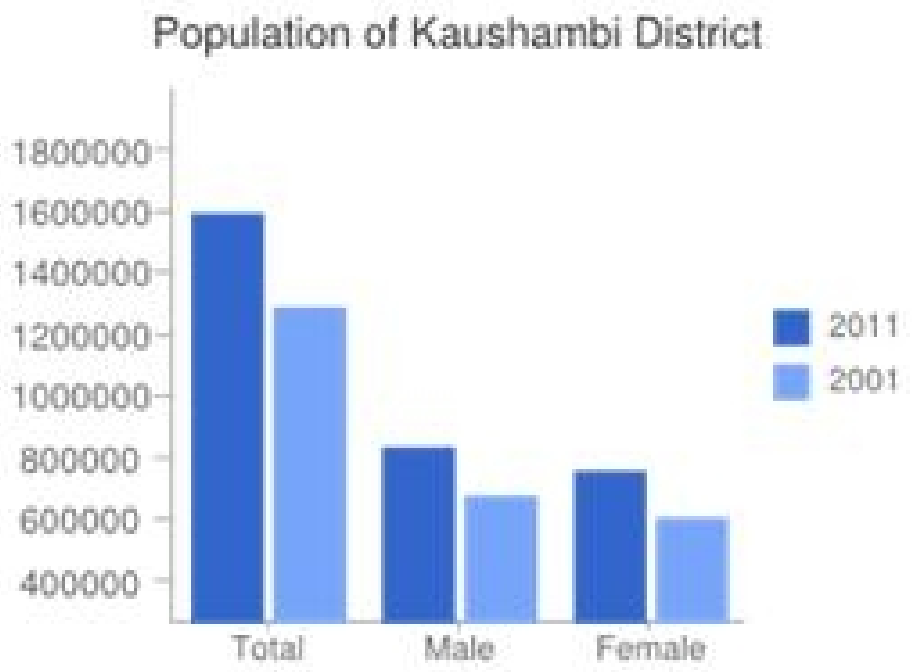

1.5 ENVIRONMENTAL AND SOCIAL SETTING OF THE REGION (PRIMARY ANALYSIS THROUGH SITE VISIT)

The purpose of the section is to give concise information on the available environmental and social settings of the area. The data presented in the following section are collected through secondary sources (Govt. web site).

1.5.1 Topography and Slope

Topography of the core zone is almost flat and gently sloping from west to east

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1.5.2 Flora

In this District Mulberry, Shisham, Alstonia, Acacia, Melia spp., Ficus, Bottl brush, Zizyphus, Bael, Kanji, Bauhunia spp., Kundu, Kath Saguan, Mahoba, Pilkhan, Semal, PIpal, Papri, Raunch, Siris, Sagaun, Toona, Junli julebi, Jamuin, Proposopis, Neem, Amaltas, Aaam, Arjun, GUlmohar, Gular, Lisoda, Cassia spp. Kadamb, are found.

1.5.3 Fauna

Only domestic animals like cow, goat, buffalo, cat, dog etc are observed / found in the area. As there is no natural forest cover, the area does not contain any wild animals. Only stray jackals are seen sometimes. Both poisonous and non-poisonous types of snakes are seen during summer and rainy seasons.

1.5.4 Land form & Seismicity

The district falls in seismic zone III, which signifies there would not be any special structural required to be considered for implementation of project. The district lies in low to moderate hazard risk zone. No earthquake has been observed in the district during last 200 years. The district has, however experienced on a few occasions earthquakes.

1.5.5 Soil

There are 5 types of soils are found in District Kaushambi.

1. Sandy Soil---Ideal soil with neutral pH, good drainage suitable for cultivation of vegetables, pulses, oilseed and millets.
2. Sandy Loam---Ideal soil with neutral pH, good water holding capacity,suitable for cultivation of vegetables, fruits, specially Banana, Papaya, Paddy, Wheat and oilseed
3. Saline Soil---Soil physico-chemical properties are disturbed due to the high pH, ECe and negative effect of sodium ions. Suitable for cultivation of paddy and wheat.
4. Alkaline Soil--- High pH, EC & cat ions need reclamation.
5. Water Logged---At some extent use for cultivation of paddy need surface and sub surface drainage.

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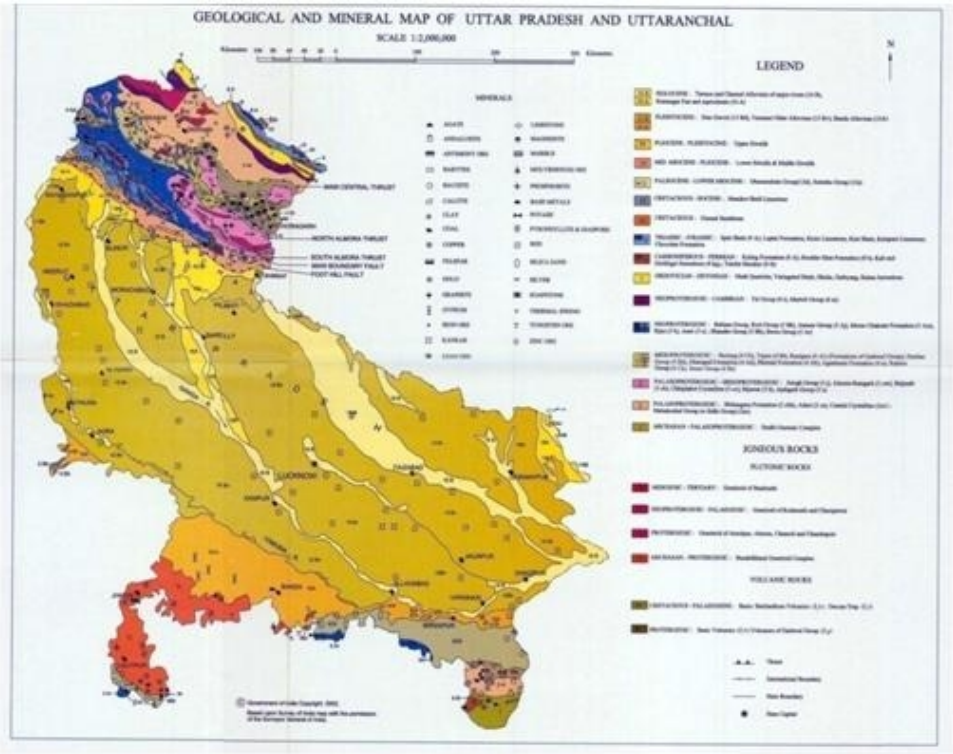

2.0 ENVIRONMENT MANAGEMENT PLAN

To mitigate the adverse impact which will be caused due to the mining operation and overall scientific development of local habitat, environmental management plan (EMP) has been formulated and integrated with the mine planning. The details of the anticipated impacts and mitigation measures have been discussed in below, based on the results of present environmental conditions and environmental impact assessment. The EMP has therefore been made considering implementation and monitoring of environmental protection measures during and after mining operations.

The factors which determine the effect have already been identified earlier in this report. To minimize the adverse impact, certain control measures are enumerated below for implementation.

2.1 Impacts of Morrum Mining

Impacts of Morrum mining can be broadly classified as given below:

2.1.1 PHYSICAL ENVIRONMENT

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The large-scale extraction of streambed materials, mining below the existing stream bed and the alteration of channel-bed form and shape lead to several impacts such as erosion channel bed and banks, increase in channel slope, and change in channel morphology. These impacts may cause: (1) the undercutting and collapse of river banks, (2) the loss of adjacent land and/or structures, (3) upstream erosion as a result of an increase in channel slope and changes in flow velocity, and (4) downstream erosion due to increase carrying capacity of the stream, upstream, downstream changes in patterns of deposition, and changes in channel bed and habitat type.

Mitigation measures

1. Morrum mining will be restricted up to 3 m or 1 m from water level whichever less.
2. The River Bed Mining (RBM) will be done in unsaturated zone. Thus minimum loss to habitat.
3. Dredging will not be allowed.

2.1.2 LAND ENVIRONMENT

The impacts of mining on land are predominantly governed by the area acquired and landuse characteristics. The satellite imagery on land use should form the basis of impact prediction on land. Cost- Benefit analysis is also carried out to see the overall benefits, the project will bring and the economic benefits the land is providing to the area are to be estimated.

Cost Benefit Analysis

The cost benefit analysis of the proposed project in terms of environment conservation and protection has been worked out as follows:

1. The project will help channelizing the river stream thus the vulnerability of flood will be controlled.
2. Employment generation for semi-skilled, non-skilled people of the locality which will enhance the socio-economic status of the local people..
3. Besides, the project will also generate revenue for State Govt. in terms of royalty and dead rent etc. from the mining lease.

2.1.2.1 Impact on quantity and characteristics of top soil

Since it is a RBM project, does not involve removal of top soil. The project will be restricted to Morrum deposit excavation which is deficient of top soil, so no loss of top soil is anticipated.

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2.1.2.2 Impact on soil quality of the surrounding area

Since it is RBM project, no over burden or waste will be generated during mining activity. Impact of siltation will be very low to Nil as there will be no pit formation.

2.1.2.3 Impact on existing land use

The mining activity is restricted along the river bed only. Since the site is government owned waste land there will be no impact on existing land use is anticipated, also the mined area would get replenished on arrival of monsoon every year itself.

2.1.2.4 Impact of siltation in the Sand/Morrum pits

Impact of siltation will be very low to Nil as there will be no pit formation.

2.1.2.5 Impact on Riverine Ecology

The mining activity will be confined along the river bed only, hence will help the river to remain channelized also avoiding natural hazards like erosion, flooding etc. thus the impact is positive and significant.

2.1.3 WASTE DUMPS

This is RBM project, no drilling; blasting is proposed and project does not involving any waste generation. The excavated material will be loaded and transported directly to the potential markets, not leaving any waste dumps behind.

2.1.3.1 Mitigation Measures

1. Mining will be done as per the mining plan in the designated lease area for 5 years from government upto the required depth only (3m or 1m from the water level whichever is less) and should be confined along the river bed only.

2. The Mineable reserves will be limited by:

a) To maintain safety and stability of Riverbanks i.e. 7.5 meter or 10% of the width of the River whichever is more will be left intact as no mining zone.

b) Bench height of maximum 0.6 m.

c) Bench slope of <30° from vertical

d) Safety distance of 10 m for the village road

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Email: admin@dasindia.org

e) No mining operation shall be carried out on at or to any point within a distance of 50 m from any of railway line (except with the previous written permission of the Railway Administration concerned), or from any reservoir, canal or other public works, such as roads and buildings or inhabited site.

3. The main stream will not be diverted to form inactive channels from mining.

4. Mining below subterranean water will not be done.

5. Riverbed mining will be carried out where lease area is executed.

6. Segments of breaded river will be used preferably for mining.

7. Mining at the concave side of the river channel will not be done so that the bank erosion may not occur.

8. Mining will be carried out at places where sediment aggregations are maximum.

9. Mining will be restricted during the monsoon season and at the time of floods.

10. Mining schedule is synchronized with the river flow direction and the gradient of the land.

11. Care will be taken to ensure that ponds are not formed in the river bed.

12. Access roads from public roads and up to river bank will be aligned in such a way that it would cause least environmental damage.

13. Siltation of agriculture Land will be prevented using 3 m buffer.

2.1.4 AIR ENVIRONMENT

2.1.4.1 Anticipated Impacts and Evaluation

Air pollution is likely to be caused at various stages of Morrum mining operations such as excavation, loading, transportation and screening of material. Dust generated during loading, unloading and transportation of Morrum is the main pollutants of Morrum 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 also loading, transportation and unloading operations may cause deterioration in air quality due to handling dry materials.

In the present case, the collection and lifting of minerals will be done using light earth movers like bar scraper & loader without any blasting. Therefore the dust generated is insignificant as compared to mining process of other hard minerals like the process of drilling, blasting etc.

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Website: www.dasindia.org
Fax: 4021236
Tel: +91 522 4007470, 410762
Email: admin@dasindia.org

2.1.4.2 Mitigation Measures

The only air pollution sources are fugitive dust emission due to movement, loading, unloading and Transportation of minor minerals. Drilling, blasting, crushing, DG Set or storage is not proposed at site.

1. Dust suppression measures like spraying/sprinkling of water to keep the surface wet.
2. Overloading of the trucks/trolleys will not be done.
3. Transportation of material will be done in covered vehicles to prevent dust emission in case of long haulage or if the road passes through in close proximity to habitation.
4. Provision of water spray on the dumper and roads to arrest fine dust before transportation.
5. Suitable dust barriers will be provided near excavation site.

2.1.5 WATER ENVIRONMENT

2.1.5.1. Baseline Status

2.1.5.2. Anticipated Impacts

There are no wastewater discharges to water bodies from the mining operations. The inflow of sewage or effluents from the surrounding locality is also considered nil. The only water contaminant is rainwater run-off during the monsoon season. There will be no impact due to the proposed mining on the water environment and the water flow pattern does not disturb the turbidity and velocity, hence no mitigation measures are suggested. There is no noticeable effect on surrounding ground water resource due to mining as the mining activity does not require ground water extraction. The collection of Morrum is done on the river bed where excessive sedimentation has been noticed upto the required depth only.

The impact on the aquatic flora & fauna due to the proposed opencast mining is insignificant as mining involves only scooping of Morrum from the river bed which will not disturb the aquatic life present in the river.

2.1.5.3. Mitigation Measures

As the project activity is carried out in dry river bed, none of the project activities affect the water environment or riparian habitats. In the projects, it is not proposed to divert or truncate any stream.

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Email: admin@dasindia.org

No proposal is envisaged for pumping of water either from the river or tapping the ground water. PP will adhere all guidelines and rules for proper and scientific method of mining during the period of extracting the Morrum. Thus, the project activities shall not have any adverse affect on the physical components of the environment and therefore may not have any effect on the recharge of ground waters or affect the water quality.

1. Mining operation will be restricted to the depth of 1.6434 m from ground level or water level whichever is less.
2. Quality of dug well to be monitored, in order to ensure the quality of water is not affected.

2.1.6 NOISE ENVIRONMENT

The proposed RBM project is OTFM (Other Than Fully Mechanized) using light earth movers like bar scraper & loader and will generate very less noise, that too by the movement of vehicles as drilling and blasting are neither proposed nor required.

2.1.6.1 Anticipated Impacts and Evaluation

As there will be no heavy earth moving machinery there will not be any major impact on noise level due to the mining and other associated activities. Blasting technique is not used for &Morrum lifting, hence no possibility of land vibration. It was found that the mining activity will not have any significant impact on the noise environment of the region. The only impact will be due to transportation of materials by trucks/trolleys.

2.1.6.2 Mitigation Measures

As the only impact is due to transportation of Morrum though village roads, emphasis will be given on the following points.

1. Well maintained and fitness certified vehicles will be used after obtaining pollution under control certificate for carrying out mining operations
2. Timely maintenance of vehicles and their silencers to minimize vibration and sound.
3. Minimum use of horns in the village area and silence zone (if any) as applicable employing trucks which are newer or less than 15 years old.
4. Care will be taken to produce minimum sound during loading
5. Laborers will be provided with personal hearing protection device i.e. ear plugs or ear muffs if required.

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Fax: 4021236
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2.1.7 TRAFFIC ANALYSIS

1. The vehicular movement within the site is inevitable. However, during operation phase this activity would not cause any significant impact on the ambient air quality.
2. The noise levels are also expected to be negligible on account of onsite vehicular movement.
3. The safety issues due to onsite vehicular movement would be negligible as the onsite vehicular traffic would follow the safety sign system.

2.1.8 BIOLOGICAL ENVIRONMENT

2.1.8.1 Anticipated Impacts and Evaluation

The mining activity will have insignificant affect on the existing flora and fauna. Data have been collected from various Government Departments such as forests, agriculture, fisheries, animal husbandry and various offices to establish the pre-project biological environmental conditions. There are no endangered species, wildlife sanctuary, wildlife corridors or eco-sensitive area near the core zone. The purpose of the project itself is to save the flora around the project area from river widening, excessive erosion and floods. It was found that the Morrum mining activity will not have any significant impact on the biological environment of the region.

Mining of River bed material will not cause any significant impact on the ecosystem of Yamuna River. Given below gives expected impact due to proposed project.

1. Disturbance to avifauna migratory routes/nesting grounds/wild fauna, birds, reptiles.
2. Damage to Riparian ecosystem/wetlands.
3. Micro flora and fauna in upstream and downstream water.
4. Impact on route of domesticated fauna viz. cow , buffalo etc of nearby villages.
5. Disturbance to Fisheries found in natural river water.

2.1.8.2 Mitigation Measures

The mining operation will have positive and long term impact on river environment as the operation will result in excavation of excessive Morrum deposits from points where the maximum sedimentation occurs, in order to prevent flooding or related natural hazards.

Since the project site is a river bank, mining activities will not have any major impact and since the deposits are replenished naturally no reclamation is proposed. There is no migratory route of birds or grazing route of domesticated animal is reported, hence there will be no impact anticipated.

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ENV Developmental Assistance Systems (I) Pvt. Ltd.
D-2247, Indira Nagar, Lucknow-226016
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Fax: 4021236
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Mining activity will be confined upto a required depth of 3m from ground level or 1m from the water level whichever is less, no mining activity will be carried out in natural river water since it is a RBM project and mining will be done along the river bed only leaving the free spaces as specified, no impact on fisheries, spawning ground or riparian ecosystem is anticipated.

2.1.9 IMPACT ON ECOLOGY OF THE AREA

Mining which leads to the removal of channel substrate, re-suspension of streambed sediment, clearance of vegetation, and stockpiling on the streambed, will have ecological impacts. These impacts may have an effect on the direct loss of stream reserve habitat, disturbances of species attached to streambed deposits, reduced light penetration, reduced primary production, and reduced feeding opportunities.

For the years, Morrum have been used in the construction of roads and buildings. Today, demand for Morrum continues to increase. Mining operators, in conjunction with cognizant resource agencies, must work to ensure that Morrum mining is conducted in a responsible manner.

Excessive and unscientific Riverbed Morrum mining causes the degradation of rivers. Riverbed mining lowers the stream bottom, which may lead to bank erosion. Depletion of Morrum in the streambed causes the deepening of rivers, and the enlargement of river mouths. Any volume of Morrum exported from streambeds is a loss to a system.

It may also be a threat to bridges, river banks and nearby structures. Morrum mining also affects the adjoining groundwater system and the uses that local people make of the river and sometimes result in destruction of aquatic and riparian habitat through large changes in the channel morphology. Impacts include bed degradation, bed coarsening, lowered water tables near the streambed, and channel instability. These physical impacts cause degradation of riparian and aquatic biota and may lead to the undermining of bridges and other structures. Continued extraction may also cause the entire streambed to degrade to the depth of excavation.

Morrum mining generates extra vehicle traffic, which negatively impairs the environment. Where access roads cross riparian areas, the local environment may be impacted.

2.1.9.1 Mitigation measures

As the present mining will be done in a scientific manner as mentioned before, significant adverse impacts are not predicted; however the following mitigation measure will be taken to further

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Website: www.dasindia.org
Fax: 4021236
Tel: +91 522 4007470, 410762
Email: admin@dasindia.org

minimize it.

1. Re-suspension, turbulence, stream flow, channel substrate and associated species will be disturbed and could be lost due to mining. This loss of species is negligible in case of river bed mining as mining will be restricted to dry river bed only leaving the safety zone as SSMMG 2016.
2. No mining will be done near to important structure like bridges, dam and others as per mining law.
3. No mining will be carried out during the rainy season and this will minimize impact on aquatic life.
4. Since it is a RBM project, it has no vegetation; therefore clearance of vegetation is not required.
5. The mining activity will employ many heavy vehicles to transport the Morrum outside the mine to desired destination. Safe site/routes having less impact will be selected for transportation, all the vehicles will be employed for transportation purpose will be PUC certified.

2.1.10. FLORA AND FAUNA OF RIPARIAN HABITAT

If Morrum mining is done in an unscientific way, i.e. beyond the replenishment capacity, riverbed mining can have adverse effects at the mine sites. The fertile streamside land will be lost gradually and the wildlife in the riparian areas may start vanishing. Degraded stream habitats will result in loss of fisheries productivity, biodiversity, and recreational potential. Thus the severely degraded channels may lower the aesthetic value too.

All species require specific habitat conditions to ensure long-term survival. Native species in streams are uniquely adapted to the habitat conditions that existed before human began alterations. These have caused major habitat disruptions that favoured some species over others and caused overall declines in biological diversity and productivity. In most streams and rivers, habitat quality is strongly linked to the stability of channel bed and banks. Unstable stream channels are inhospitable to most aquatic species.

No dredging is proposed and hence there will be no possibility of sediments altering water quality.

Factors that increase or decrease sediment supplies often destabilize bed and banks and result in dramatic channel readjustment. For example, human activities that accelerate stream bank erosion, such as riparian forest clearing/ Riverbed mining cause stream banks to become net sources of sediment that often have severe consequences for aquatic species. Anthropogenic activities that

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ENV Developmental Assistance Systems (I) Pvt. Ltd.
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Website: www.dasindia.org
Fax: 4021236
Tel: +91 522 4007470, 410762
Email: admin@dasindia.org

artificially lower stream bed elevation cause bed instabilities that result in a net release of sediment in the local vicinity. Unstable sediments simplify and, therefore, degrade stream habitats for many aquatic species.

The most important effects of excessive and unscientific Riverbed Morrum mining on aquatic habitats are bed degradation and sedimentation, which can have substantial negative effects on aquatic life. The stability of Morrum-bed streams depends on a delicate balance between stream flow, sediment supplied from the watershed, and channel form. Mining- induced changes in sediment supply and channel form disrupt channel and habitat development processes. Furthermore, movement of unstable substrates results in downstream sedimentation of habitats. The affected distance depends on the intensity of mining, particle sizes, stream flows, and channel morphology. Channel widening causes swallowing of the streambed, producing braided flow or subsurface inter gravel flow in riffle areas, hindering movement of fishes between pools.

All such impacts can be reduced by following scientific mining practices and mitigation measures.

2.1.10.1. Mitigation measures

Proper environmental management plan are proposed for "River Bed Material" mining project to mitigate the impact during the mining operation.

1. Mining operation will be suspended during monsoon season.
2. Mining operation will be carried out during day time.
3. No labour camps will be allowed on river bed and in reserve forest area.
4. No labours will be allowed, to enter reserve forest area
5. No cooking, or burning of woods will be allowed in the forest area. This will prevent forest fire.
6. Prior to mining, short awareness program will be conducted for labours to make them aware of the forest and way of working.
7. If some casualty or injury to animal occurs, it will be informed to forest department and proper treatment should be given.
8. No lighting will be allowed in the reserve forest area.
9. No tree cutting, chopping, lumbering, uprooting of shrubs and herbs should be allowed.
10. No tract or new road for movement of labours or vehicles be laid in reserve forest area, this will prevent forest fragmentation, encroachment and human - animal encounter.

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11. Corridor movement of wild mammals (If exists) will be avoided

12. Care should be taken that noise produced during vehicles movement for carrying RBM materials are within the permissible noise level. Higher noise level in the forest area will lead to restless and failure in detection of calls of mates and young's once.

13. No piling of RBM material should be done in agricultural or reserved forest areas.

14. Care should be taken that no hunting of animals or collections of medicinal plant are carried out by labours.

15. If wild animals are noticed crossing the river bed, it should not be disturbed or chased away, instead the labours should move away from their path.

2.1.11. SOCIO-ECONOMIC ENVIRONMENT

The proposed project will have direct and positive impact on socio-economic environment. The field survey conducted based on a social survey to understand the knowledge and the perception of the people living around the project area, gives a clear idea about the need for the project.

The project activities shall not have any adverse impacts on any of the common property resources of the village communities, as the Morrum 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

This activity will help raise the socio-economic status of the people who are directly and indirectly involved.

This project will provide employment to the people residing in vicinity people will to be benefited directly or indirectly by the project. Only local labour will be used for the proposed mining operation.

2.1.11.1. OCCUPATIONAL HEALTH

There is no environmental pollution due to the proposed mining as it is proposed to be semi-mechanized OTFM (Other Than Fully Mechanized) extraction of Morrum on the banks of River Yamuna. Hence there will be no major occupational health hazards.

The villagers avail medical facilities from the public health center locally and for specific treatments & health assistance they avail facilities from govt. hospital located at district.

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ENV Developmental Assistance Systems (I) Pvt. Ltd.
D-2247, Indira Nagar, Lucknow-226016
Website: www.dasindia.org
Fax: 4021236
Tel: +91 522 4007470, 410762
Email: admin@dasindia.org

2.1.11.2. ANTICIPATED HEALTH IMPACT

A health survey showed that the effect on public health will be primarily due to emanation of dust & smoke from the haulage of transport vehicles in the buffer zone. On continuous exposure to the proposed activities certain occupational health hazards are anticipated:

1. Fungal infection of the hands and legs due to constant contact with the wet Morrum.
2. Due to lack of personal hygiene water borne diseases are also envisaged to the workers.
3. Continuous exposure to Morrum dust can lead to silicosis, Silica tuberculosis other pulmonary diseases.

Proposed mining activity may not pose any adverse health hazard to the people in & around the area as healthy mining practices are carried out during the course of mining and the activities are restricted to small scale extraction.

2.1.11.3. Mitigation measures

An inventory of the risks involved during the proposed project would be delineated with the measures to mitigate the same and the same would be ensured to the people by conducting an awareness program in the surrounding areas.

1. Predominantly mining activities will be opencast, semi-mechanised/OTFM to avoid accidental hazards.
2. Laborers will have access to basic first aid (first aid -box) facility on site.
3. Awareness on safety and ensure using of personal protective equipments (PPE) by workers like gloves, helmets, boots ear plugs and ear muff etc. to avoid injuries.
4. The workers will be trained on using personal equipments as a precautionary measure & thereby preventing any infectious diseases.
5. Workers will be periodically made aware of health & safety and various other risks.
6. Special emphasis to the women health regarding the pre-natal and post-natal care will be looked into which is very much neglected in the rural areas.

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ENV Developmental Assistance Systems (I) Pvt. Ltd.
D-2247, Indira Nagar, Lucknow-226016
Website: www.dasindia.org
Fax: 4021236
Tel: +91 522 4007470, 410762
Email: admin@dasindia.org

2.2 ENVIRONMENTAL MANAGEMENT PLAN

Environmental Management measures for general Impacts

This section recommends the management measures needed to prevent minimize and mitigate the general impacts arising in operation phase as shown in Table below:

Table: EMP for the general anticipated impacts

AIR ENVIRONMENT								
SN.	**Impact**	**POSSIBLE IMPACTS**					**Project specific Significance**	**Mitigation Measures**
		Type	**Nature**	**Magnitude**	**Duration**	**Significance**		
1	Dust pollution due to Sand/Morrum loading and transportation	+ve	Direct	Moderate	Short Term / Temporary	Irreversible	Significant	1.Safe handling practices be adopted to minimize the creation of dust and handling will be limited during windy conditions.; 2.Dust suppression measures like spraying/sprinkling of water on haulage route of .6 km to keep the surface wet and provision of the dust barriers. 3.Overloading of the trucks/trolleys will not be done. 4.Transportation of Sand/Morrum will be in covered vehicles to prevent fugitive dust emission. The road will be properly maintained.
2	Fugitive emission by other sources	-ve	Direct	Moderate	Short Term / Temporary	Irreversible	Insignificant	1.No open burning of waste will be permitted.
3	Fugitive emissions from vehicle tailpipe & stack due to movement of bar scalper and due to loading and transportation of minor minerals	-ve	direct	Moderate	Short Term / Temporary	Irreversible	Insignificant	1.Air filters on all mechanized equipment will be maintained. 2.Only PUC certified vehicles will be deployed for transportation of Sand/Morrum which will not be older than 15 years. 3.Speed of mine machinery & transportation vehicle will be limited to 5 km/hr at or near project site to avoid dust emissions.
BIOLOGICAL ENVIRONMENT								
SN.	**Impact**	**POSSIBLE IMPACTS**					**Project specific Significance**	**Mitigation Measures**
		Type	**Nature**	**Magnitude**	**Duration**	**Significance**		
1	Micro flora and fauna in upstream and downstream water	-ve	Indirect	Moderate	Short Term / Temporary	Nil	Insignificant	1.The main stream will not be diverted to form inactive channels from mining. 2.Mining below the lean water level will not be done.
2	Impact on route of domesticated fauna viz. cow, buffalo etc. of nearby villages	Nil	Nil	Nil		Nil	Marginally Significant	1.The lease area is devoid of any vegetation thus do not serve as grazing land for animals. 2.Temporary fencing of lease area other flood season will be explored.
3	Disturbance to fisheries found in	-ve	Indirect	Moderate	Short Term / Temporary	Nil	Low Impact	1.Mining will be confined along the dry river bank. Main river course will not be

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ENV Developmental Assistance Systems (I) Pvt. Ltd.
D-2247, Indira Nagar, Lucknow-226016
Website: www.dasindia.org
Fax: 4021236
Tel: +91 522 4007470, 410762
Email: admin@dasindia.org

BIOLOGICAL ENVIRONMENT								
SN.	Impact	POSSIBLE IMPACTS					Project specific Significance	Mitigation Measures
		Type	Nature	Magnitude	Duration	Significance		
	natural river water							disturbed. 2.Trapping, snaring, hunting, fishing or killing of any animal will be strictly prohibited at mining site.
4	Damage to Riparian ecosystem/ wetlands	-ve	Indirect	Low		Nil	No Impact	1.Mining activities will not cause any harm to riparian vegetation cover as the working will not extend beyond the offset left against the banks. 2.The core zone of river where mining operation is proposed consists of no riparian vegetation Most among them are weeds, No ecologically sensitive plant species has been reported from this area.
5	Disturbance to avifauna, migratory routes/ nesting grounds/ wild fauna, terrestrial bird, breeding and feeding birds, reptiles.	-ve	Indirect	Low		Nil	No Impact	1.It will be ensured that disturbance of indigenous fauna and flora, and the natural ecology in the surrounding areas will be avoided. No Migratory routes are identified within the stretch. 2.Stipulated safe zone from all 3 side will be maintained to ensure minimizing the impact outside the lease area. Additionally, the plantation as per EMP will be carried out on riparian zone & shrub & bush plantation along the haulage route.

NOISE ENVIRONMENT								
SN.	Impact	POSSIBLE IMPACTS					Project specific Significance	Mitigation Measures
		Type	Nature	Magnitude	Duration	Significance		
1	Increase in ambient noise level due to movement of site vehicles	-ve	Indirect	Low	Short Term / Temporary	--	Insignificant	1.Mining activities will be restricted to daytime only and along the riverbed.

SOCIOECONOMIC ENVIRONMENT								
SN.	Impact	POSSIBLE IMPACTS					Project specific Significance	Mitigation Measures
		Type	Nature	Magnitude	Duration	Significance		
1	Increase in Aesthetic conditions by local economic development	+ve	Direct	Moderate	Short Term / Temporary	Reversible	Positively significant	1.Employment opportunities will improve the overall economic development of the labours.
2	R & R	NA	NA	Nil		NA	NA	NA
3	Generation of employment Opportunities	+ve	Direct	Moderate	Short Term / Temporary	Reversible	Positively significant	1.Will improve the livelihood condition of the nearby areas by providing employment opportunities.
4	Training of workers	+ve	Direct	Moderate	Short Term / Temporary	Reversible	Positively significant	1.Awareness on safety and ensure using of personal protective equipments (PPE) by workers like gloves, helmets, boots ear plugs and ear muff etc. to avoid injuries.
5	Occupational Health	-ve	Direct	Moderate	Short Term / Temporary	--	Insignificant	1.Laborers will be provided with onsite basic first aid (first aid box) facility and personal protective equipments (PPE).

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ENV Developmental Assistance Systems (I) Pvt. Ltd.
D-2247, Indira Nagar, Lucknow-226016
Website: www.dasindia.org
Fax: 4021236
Tel: +91 522 4007470, 410762
Email: admin@dasindia.org

SOIL AND LAND ENVIRONMENT

SN.	Impact	POSSIBLE IMPACTS					Project specific Significance	Mitigation Measures
		Type	Nature	Magnitude	Duration	Significance		
1	Impact due to topsoil stockpiles, if any	+ve	Direct	Low	Short Term / Temporary	Reversible	Not applicable	1.Absence of topsoil in mining lease area is observed, so no mitigation measures required.
2	Generation of MSW and incidental waste	NA	NA	Nil		NA	Insignificant	1.It is a Sand/Morrum mining project, no mine waste generation is anticipated. Workers will be hired locally to avoid permanent housing at site, thus the MSW waste generation will be minimized. 2.For collection of incidental waste dustbin will be provided at suitable places which will be further disposed off at grampanchayat dump site at regular intervals.
3	Formation of pits in mine lease area	Nil	Nil	Nil		Nil	Not applicable	1.Using the bar scalping method will decrease the chances of any pit formation. 2.The Sand/Morrum bars scalped will be reformed on arrival of monsoon every year.
4	Erosion of river banks	-ve	Direct	Moderate	Short Term / Temporary	Reversible	Significant	1.Access to riverbed will be restricted to only one corridor through the riparian buffer. Ensure water course will not be altered and the integrity of the river banks are not compromised and eroded. 2.During the mining activities, there will be the protection of areas susceptible to erosion by installing necessary temporary and permanent drainage works as soon as possible and by taking measures to prevent the surface water from being concentrated in streams and from scouring slopes, banks or other areas. 3.Mining activities will be confined along the river bed maintaining the specified safety zone. 4.In order to reduce the flood impacts, surrounding vegetation, especially larger trees and shrubs will be preserved.
5	Impact on existing land use	+ve	Direct	High	Short Term / Temporary	Reversible	Impact on existing land use Insignificant	7.No impact as the mined area gets replenished every year during monsoon season. 8.The riverbed is government land which is presently not being used for any purposes. After 05 years of lease period land use will be back to its original uses.
6	Land contamination (by diesel, oil etc.) due to movement of site vehicles.	+ve	Direct	High	Short Term / Temporary	Reversible	Significant	1.It will be ensured that the bar scraper and front-end loader are properly maintained. 2.Equipments will be regularly serviced and inspected to make sure there are no leaks of oil, diesel, fuel, detergents or hydraulic fluids. 3.Servicing and maintenance of vehicles as far as possible will occur outside of the boundaries of mining lease area. If

DAS INDIA
ENV Developmental Assistance Systems (I) Pvt. Ltd.
D-2247, Indira Nagar, Lucknow-226016
Website: www.dasindia.org
Fax: 4021236
Tel: +91 522 4007470, 410762
Email: admin@dasindia.org

SOIL AND LAND ENVIRONMENT								
SN.	Impact	POSSIBLE IMPACTS					Project specific Significance	Mitigation Measures
		Type	Nature	Magnitude	Duration	Significance		
								maintenance does occur on site due to breakdown, all steps will be undertaken to avoid hydrocarbon spills/leakages. 4.Under no circumstances will oil or diesel to be stored and disposed off at the site. 5.No night parking of vehicles in the mining lease area. 6.Vendors of UPPCB will be contracted for collection of hazardous waste (used oil) & oil spill kit will be provided with each vehicle.
7	Impact on agricultural land and productivity in terms of compaction of soil by movement of site vehicles	-ve	Indirect	Nil		NA	Insignificant	1.Mineral transportation will be done by haulage route (almost .6 km) which is further connected to pre-existing village road. So agricultural land will not suffer by soil compaction.
WATER ENVIRONMENT								
SN.	Impact	POSSIBLE IMPACTS					Project specific Significance	Mitigation Measures
		Type	Nature	Magnitude	Duration	Significance		
1	Impacts on Riparian vegetation and stream habitat	-ve	Direct	Low	Short Term / Temporary	Irreversible	Insignificant	Project activity will be carried out along the river bed only leaving free space as specified, thus do not affect water environment and riparian habitat.
2	Pollution of ground water/surface water due to E. Coli Enterobacteria/viruses and plant nutrients if sanitation for mine operators is not properly managed.	+ve	Direct	High	Short Term / Temporary	Reversible	Insignificant	1.Make shift toilets will be made available to the workers near project site. 2.No disposal of sewage will occur on or near the site. 3.Toilets will be provided by the proponent in accordance with DW & S requirements.
3	Interruption in natural drainage pattern of the mine site and surrounding areas.	+ve	Direct	High		Reversible	Insignificant	1.Riverbed mining will maintain the natural course of River. In this project it is not proposed to truncate or divert any stream. 2.The main stream will not be diverted to form inactive channels from mining. 3.Mining below subterranean water will not be done. 4.Riverbed mining will be carried out where sediment replenishment capacity is greater. No pits/channels will be formed. 5.Segments of braided river will be used preferably for mining. 6.Mining at the concave side of the river channel will not be done so that the bank erosion may not occur. 7.Mining will remove excess deposits and deepen river bed which will prevent flooding and related problems.

DAS INDIA
ENV Developmental Assistance Systems (I) Pvt. Ltd.
D-2247, Indira Nagar, Lucknow-226016
Website: www.dasindia.org
Fax: 4021236
Tel: +91 522 4007470, 410762
Email: admin@dasindia.org

WATER ENVIRONMENT								
SN.	Impact	POSSIBLE IMPACTS					Project specific Significance	Mitigation Measures
		Type	Nature	Magnitude	Duration	Significance		
4	Pollution of ground water/surface water with typical pollutants such as oil and diesel, if machines operated	+ve	Direct	High	Short Term / Temporary	Reversible	Insignificant	1.Diesel will not be stored on mining site and if stored it will be on a hard surface and 100 m away from any drainage lines. 2.It will be ensured that the scraper and front-end loader are properly maintained. 3.Equipments will be regularly serviced and inspected to make sure there are no leaks of oil, diesel, fuel, detergents or hydraulic fluids. 4.Servicing and maintenance of vehicles as far as possible will occur outside of the boundaries of mining lease area. If maintenance does occur on site due to breakdown, all steps will be undertaken to avoid hydrocarbon spills/ leakages. Under no circumstances will oil or diesel to be disposed off at the site.

2.4 RESETTLEMENT & REHABILITATION

Not applicable

2.5. ENVIRONMENTAL MONITORING PLAN

An Environmental monitoring programme has been prepared for the proposed project for periodical assessment of effectiveness of implementation of Environment Management Plan and to take corrective measures in case of any degradation in the surrounding environment.

For assessing the prevailing quality of air, water, noise, land etc., regular monitoring of parameters are necessary. The data assessed will be helpful in predicting the impact and planning suitable measures to improve / protect the environment. In the study area, the lessee will carry out monitoring studies for ambient air quality, fugitive dust, water quality, noise levels and soil quality as per the standard procedures and schedules. The monitoring system will include:

1. Monitoring stations in the buffer zone remain the same as selected in this study for Air, water, Soil, Noise etc.
2. Implementation of the planned mitigating measures.
3. Monitoring the programme of implementation.

The Environmental parameters will be monitored & samples will be analyzed as per the stipulations of Indian Bureau of Mines & UP Pollution Control Board and as per MOEF Guidelines. The above

DAS INDIA
ENV Developmental Assistance Systems (I) Pvt. Ltd.
D-2247, Indira Nagar, Lucknow-226016
Website: www.dasindia.org
Fax: 4021236
Tel: +91 522 4007470, 410762
Email: admin@dasindia.org

monitoring proposals shall be adhered to and the results shall be intimated to the appropriate authorities for their perusal and records. A typical environmental monitoring plan is given below in Table 7:

Table 7: Scheme of Environment Monitoring

SNo.	Monitoring Parameters	Frequency of Monitoring
1.	**Ambient Air:** Ambient Air Quality at appropriate location for Particulate Matter (PM10/ PM2.5), SO2 & NO2 1. In the vicinity of the mine area. 2. On haulage road.	Half-yearly
2.	**Water:** 1. Two Surface (Up Stream & Down Stream) & One Ground Water Samples in the nearby area of the project site	Yearly
3.	**Noise:** Day & Night level Noise Monitoring at mining site.	Half-yearly
4.	**Soil:** One sample of mining site and one in surrounding area	Yearly

2.5.1. Organizational setup for Environment Monitoring

Major attributes of environment are not confined to the mining site alone. Implementation of proposed control measures and monitoring programme has an implication on the surrounding area as well as for the region. Therefore, mine management should strengthen the existing control measures as elaborated earlier in this report and monitor the efficacy of the control measures implemented within the mining area relating to the following specific areas for eco-friendly mining:

1. Collection of air and water samples at strategic locations with frequency suggested and by analyzing thereof. If the parameters exceed the permissible tolerance limits, corrective regulation measure will be taken.

2. Collection of soil samples at strategic locations once in every year and analysis thereof with regard to deleterious constituents, if any.

3. The effectiveness of drainage system depends upon proper cleaning of all drains provided in the surrounding of mine area. Any blockage due to siltation or loose material will be checked at least once in a month.

DAS INDIA
ENV Developmental Assistance Systems (I) Pvt. Ltd.
D-2247, Indira Nagar, Lucknow-226016
Website: www.dasindia.org
Fax: 4021236
Tel: +91 522 4007470, 410762
Email: admin@dasindia.org

4. Measurement of water level fluctuations in the nearby ponds, dug wells and bore wells.

5. Regular visual examination will be carried out to look for erosion of river banks. Any abnormal condition, if observed will be taken care of.

6. Measurement of noise levels at mine site, stationary and mobile sources, and adjacent villages will be done in every quarter of the year.

7. Monitoring Ground Vibrations: Ground vibrations studies or monitoring is not required as there is no proposal of drilling / blasting for scooping operations.

2.6. IMPLEMENTATION OF EMP

As the major environment attributes will continue to be around the project area alone, implementation of the proposed control measures and monitoring thereof will be undertaken on a regional basis. The project proponent will ensure the implementation of the measures within the mine area and carryout efficient monitoring through outsourcing to competent certified consultants and laboratories.

In order to implement the measures suggested for mitigating the adverse impacts on the environment, it is suggested to monitor the environmental parameters regularly.

2.7. ENVIRONMENT MANAGEMENT MECHANISM

No cell is proposed to form; the plan will be implemented through outsourcing suitable and accredited consultants and experts.

Environmental Monitoring will be directly coordinated by the Supervisor / Owner. Competent outsourced certified organization/lab personnel will conduct the monitoring operations. A full-fledged laboratory is not essential; part of the work will be given to competent consultants to undertake these jobs.

Regular semi skilled manpower will be required for supervision, assistance in reclamation works followed by trained unskilled labourers to carry out other necessary operations.

2.7.1. Functions of the EMP Implementation Team

1. Implementation of the mitigation measures.
2. Maintain Records of the operation.

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3. Monitoring the programme of implementation.
4. To estimate the efficiency of measures taken.
5. To bring out any other unforeseen effect on environment not covered under the report.
6. Inspection and regular maintenance of mining equipments and transport vehicles.

2.8. BUDGET FOR ENVIRONMENTAL MANAGEMENT

Annual budget for EMP is very essential for successful implementation of EMP. The fund allocated will not be diverted for any other purposes and the top management will be responsible for this. The budget will take into consideration the following capital and operating expenses:

Table 8: Cost of Environment Management Plan (EMP)/annum

SNo.	Environment Management Plan (EMP)	Units	Total Cost (Rs.)	
			Capital	Recurring
a	**Plantation**			
	No of plants (@5 plants/ha)	90	9,000.00	--
	Tree Guard (@2000/- per unit)	90	1,80,000.00	--
	Water Demand for plantation (@ 0.5 litre / plant)	45.00 L/day	49,500.00	1,98,000.00
b	**Air Pollution Control**			
	Sprinkling on haulage route for dust supression (Rs. 1000/day)	275 days	1,98,000.00	7,92,000.00
c	**Environmental Monitoring**	--	2,70,000.00	10,80,000.00
	Total		7,06,500.00	20,70,000.00
Grand Total			**27,76,500.00**	

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