ENVIRONMENTAL MANAGEMENT PLAN

FOR

SAND MINOR MINERAL PROJECT

(KHARASANKULAI SAND QUARRY)

Maximum Production Capacity – 7000 Cum / Year

Lease Area – 12.355 Acre or 5.00 Ha

Screening Category – 'B2'

Applicant

TAHASILDAR HARABHANGA
DIST. – BOUDH, ODISHA

ENVIRONMENTAL MANAGEMENT PLAN

INTRODUCTION

This project is meant for River sand from Kharasankulai Sand Quarry as minor mineral over an area of 12.355 acres or 5.00 Ha.The project site is located in village Kharasankulai, Tahasil- Harabhanga, District Boudh, Odisha. The revenue department, Govt. of Odisha has granted the lease in favour of Tahasildar, Harabhanga District- Boudh, State- Odisha for 5 years.

1. Name and Address of the holder of the Mining lease.

Details of the Lease

Name	**KHARASANKULAI SAND BED**
Applicant	Tahasildar Harabhanga, District- Boudh, State- Odisha.
Period of concession	5 years

1.2. Details of the area:

Name	**KHARASANKULAI SAND QUARRY**
Area	5.00 Hec/12.355 Acre
Village	Kharasankulai
Khata Number	107
Plot No	100/A, 118/A
Kisam/ Type of Land	Nadi
GPS Co-ordinate	**Lattitude-20° 41'45.72"N to 20° 41'54.47"N Longitude-84°30'52.19"E to 84°31'2.71"E**

1.3. Details of Machine to be used in Mining Operation:

No machines are proposed to be deployed to carry out wining of sand in Kharasankulai Sand Quarry. The proposed Activity is Opencast by manual dry pit mining method and Sand is excavated in layers up to an depth of 2.0 m. The sand is extracted & loaded & transferred from pits to the user through tractors/Tippers. It will be covered with Tarpaulin. The mining will be done on single shift bases. The local man power will be engaged in the mine.

1.4. Detail of Measurement of mining Pit earlier excavation in the area to be sanctioned and details of mineral Concessions situated within 100 meter periphery of this area:

Not. Applicable

1.5. Scheme of Tree Plantation:

Plantation is carried out around the mine, to reduce the dust emission at source. The total allotted lease area is 0.175 Ha. Since the deposits are within the river, it has been planned to make plantation along the road connecting to the river & the river bank adjacent to the lease hold. Therefore 100 plants are proposed per year with survival rate of 80%. The dead plants will be replaced by fresh plantation to reclaim the original number.

Year	Saplings to be planted	Species	Place of Plantation
I	20	Peepal, Mango, Banyan, Neem, Bahada, Acacia etc. and others as suggested by SPCB/ Forest Department	Along the roads, in schools and public building, river bank adjacent to the lease hold and other social forestry program.
II	20		
III	20		
IV	20		
V	20		
Total	**100**		

1.6 Details and approximate distance of National Park, Sanctuary, Biodiversity area, and Inter State boundary situated within periphery of 10 Km. from the area to be sanctioned:

No National Park, wild life sanctuary, Biodiversity area, Inter State boundary is situated within periphery of 10 Km from the sanctioned area.

1.7 Proposed annual production of mineral:

Total annual proposed production is about 7000 m^3 per annum of minor minerals from river bed.

Year Of Plan	Surface Area (m^2)	Depth (m)	Volume Of Sand (m^3) (@100% Recovery)
1st Year	3500	2	7000
2nd Year	3500	2	7000
3rd Year	3500	2	7000
4th Year	3500	2	7000
5th Year	3500	2	7000
TOTAL			**35000**

1.8 Effect on ground water level due to mining operation and its preventive measures:

The proposed mine workings will be above the ground water table thus no measures will be required.

1.9 Details of Scheme of continuous reclamation and rehabilitation of the land degradation due to mining operation:

Sl. No.	Type of Land Use	Area in Hectares	
		At Present (Existing)	During Plan Period
1	Area under excavation including roads	--	1.75
2	River water	0.932	0.932
3	Green belt	--	0.175
4	Unutilized land	4.068	2.143
	Total	**5.00**	**5.00**

1.10 Details of preventive and control scheme of air and water pollution.

Particulars		Details
Air Quality Management	Loading	Water sprinkling will be done before loading by making it moist.
	Transportation	• Water sprinkling during transportation over approach roads will be done for suppression of dust. • Regular maintenance of machinery will be carried out. • Overloading will be prevented. • Trucks/Dumpers will be covered by tarpaulin covers.
	Plantation	• Plantation will be carried out at the approach road, along the road of river bank and vicinity area in village roads.
	Monitoring	• Periodic air quality monitoring will be done and adequate measures will be taken
Noise Management	Transportation	• Source of noise will be during operation of transportation vehicles, for this proper maintenance will be done at regular intervals. • Oiling & greasing at regular interval will be done. • Adequate silencers will be provided in all the diesel engines of vehicles. • Minimum use of horns and speed limit of 10 km/hr. in the village area. • It will be ensured that all transportation vehicles carry a valid PUC Certificates.
Green area	Plantation	• Plantation will be carried out at the approach road, river bank and vicinity area to control Dust, Air & Noise Pollution and improve aesthetic environment.
Water Quality management	Surface water quality mgt.	• Waste water will not be generated during removal/ collection of river bed material. Mining will be conducted on dry area.
	Ground water quality management	• Ground water will not be intersected during mining activities. • Excavation will be carried out up to a maximum depth of 3 meter from the surface of river bed material deposit.
	Waste	• Waste water will not be generated during removal/

	water management	collection of river bed material. • Washrooms will be made available near working blocks. • Septic tanks and soak pits will be provided for the disposal of domestic/ washrooms effluents.
Solid Waste Management		• No waste is generated in the mining activities as the project involves collection of river bed material.
River bank protection & management		• Collection will be done during day light only. • No stockpiling of collected Sand will be done. Mining will be conducted on demand. • Mining will be done for 2. meter thickness at a time in the direction of river, to avoid the providing effect & maintaining the uniform surface. • Markers showing water level will be marked on the site.

Surface Water:-

A: General

Nil

The mining shall not cause any change or diversion of any source of water in the area or any drainage pattern because mining will be restricted to much above the ground water table. The site lies on the river bed of Mahamdi & mining will be done on the upstream side.

B: Chemical

Nil

C: Ground Water

There will be no impact on the ground water as the mining will be restricted to 3 m depth or 1m above the groundwater table whichever comes earlier.

Environmental Mitigation Measures to be taken:-

1. Water sprinkling on transport road side (upto approx. 0.5 to 1 km stretch), Water sprinkling on stock yard etc. will be carried out by water tankers.
2. Development of green belt with wide leaf trees will reduce the dust pollution.

3. Regular maintenance of the vehicles will be done to reduce noise pollution.

1.11 Provision for separate stacking of surface soil excavated from mining operation and its utility:

No there is no provision for separate stacking of surface soil excavated from mining operation. The excavated soil is used for covering the reclaimed area, which can help in the improvement of the growth of the planted saplings.

1.12 Details of social and economic up gradation of mining effected area due to proposed project:

There is a positive impact on the socio economic condition of the local people. The proposed mining activity will generate direct employment of about 5 personal and indirect employments of about 3 personal.

1.13 Details of budgetary arrangement for environment management:

Total Rs.1.3 Lakhs will be utilized annually for environment management like Plantation, Water sprinkling on transport road etc and Rs 0.4Lakhs for CSR activities like Health, Education, Insurance of workers etc. The details of expenditure are given in table below:

Table: Budgetary measures for EMP

Proposed Action Plan	Expenses per Year (in Rs.)
Pollution Control • Dust Suppression	20,000
Expenditure for Environment Monitoring	20,000
CSR Activities	40,000
Development of Green Belt	20,000
Haul road repair	20,000
Miscellaneous	10,000
TOTAL	1,30,000

1.14 Any other details desired to be submitted by mineral concession holder:

Change in topography & land use pattern. No the change in the topography and in the land use is temporary.

The mining activity involves in the excavation of mineral Ore those results in the creation of depressions in the area. But the excavated pits created will be converted to water recharge pits during the conceptual period. Hence there would be temporary change in the topography and land use pattern which are reclaimed after mining.

1.15.1 Effect on Flora & Fauna.

Mining activity causes impact on flora and fauna due to land degradation, deforestation, etc, however as the mining is restricted to very small area there is no likelihood of any deforestation being caused. No impact on fauna and flora is anticipated due to propose mine.

1.15.2 Effect on Climate.

There is no impact on the climate as the proposed mining will adopt the mitigation measure to control the pollution. The proposed mining is restricted to very small area and limited depth of only up to 3 m and no pollutants, are envisaged hence, there will not change in any natural wind barrier or microclimate regime.

1.15.4 Noise Pollution

Noise is generated during mining and allied activities. The vehicles adopted for mining activities will be regularly maintained.

1.15.5 Accumulation of Wastes

No dumping is involved.

1.15.6Visual Impact

There is no any visual impact in the vicinity.

1.15.7 Historical Monuments

There is no place of tourist interest, historical or religious importance in the vicinity.

2. ENVIRONMENT MONITORING PLAN

2.1 INTRODUCTION

Regular monitoring of environmental parameters is of immense importance to assess the status of environment during project operation. The knowledge of baseline conditions comes through monitoring of environmental parameters; the monitoring program will serve as an indicator for environmental conditions due to operation of the project. Monitoring is an important tool for the management, environmentalist and policy maker to make changes in pollution control equipments, environmental policy to save environment. It is decision making tool for the state of environment carried out through periodic monitoring. Further, impact assessment study is carried over short period of time and the data cannot bring out all variations induced by the natural or human activities. Therefore, regular monitoring program of the environmental parameters is essential to take into account the changes in the environmental quality over the period of time to comply environmental conditions necessary to save environment.

2.2 MONITORING OBJECTIVE

Monitoring will conform to commitments and compliances. This may take the form of direct measurement and recording of quantitative information, such as amount and concentrations of discharges. The objectives of the monitoring are:-

- Very effectiveness of planning decisions;
- Measure effectiveness of operational procedures;
- Conform statutory and corporate compliance; and
- Identify unexpected changes.

2.3 ENVIRONMENTAL MONITORING CELL

A centralized 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 mine operation. With the knowledge of initial parameters, deviations in environmental conditions due to operation of the mine will be assessed and mitigation steps will be taken to safeguard the environment. The routine monitoring program will be implemented under the project monitoring as per CPCB & MoEF & CC guidelines. Officer not below the rank of General Manager will be responsible of Environmental Management Cell and execution of environmental monitoring program.

Hierarchy of Environmental Management Cell

In order to maintain the environmental quality within the stipulated standard, regular monitoring of various environmental parameters will be necessary. Environmental Management Cell under Senior Officer (not below the rank of General Manager) will be constituted for regular monitoring, compliances, supervision and hearing of complain and reporting.

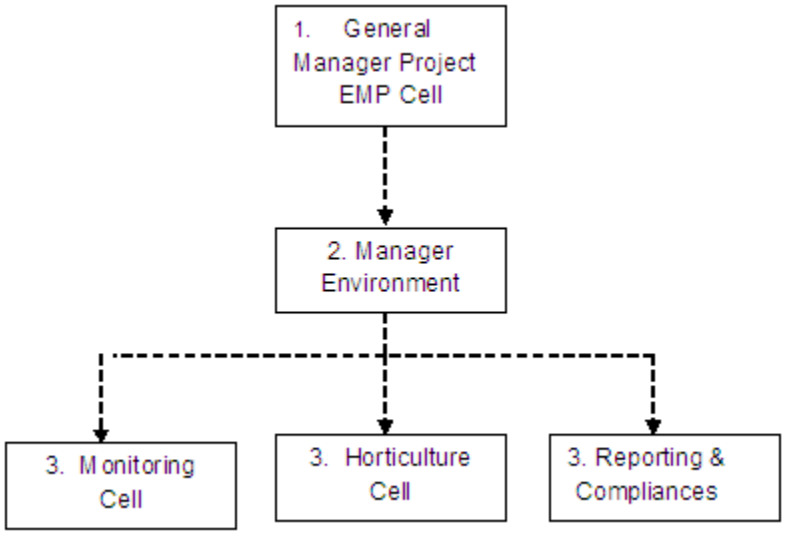

Fig: *Hierarchical Structure of Environmental Cell*

The core responsibilities of the Environmental Monitoring Cell will be:-

- The organization and interpretation of the environmental monitoring data to establish a record of change associated with the implementation of a project or the operation of an organization.
- The process of verification that all or selected parameters measured by Environmental Monitoring Program are in compliance with regulatory requirements, internal policies and standards, and established environmental quality performance limits.

Assessment of the effective environmental management system, practices and procedures:

- The environmental monitoring and audit work will be carried out by qualified personnel.
- A summary of non-compliance of the environmental quality performance limits.
- To implement and monitor the control and protective measures based on the EMP.
- To coordinate the environment related activities to the top management within as well as with outside concerned agencies.
- To provide of health check up of workers and the people living in nearby villages.
- To develop greenbelt in the nearby villages, schools, Govt. offices and transportation routes.

2.4 ENVIRONMENTAL PARAMETER

Environmental monitoring schedules will be prepared covering various phases of project advancement, such as Mining and regular operational phase. Environmental Monitoring Program will be conducted once in season except monsoon.

Table: Environmental Parameter and Frequency

S.No.	Potential Impact	Parameters for Monitoring	Frequency of Monitoring	Location
1	Air Emission	PM_{10}, $PM_{2.5}$, SO_2, NO_X & CO	As per CPCB / MoEF & CC requirement i.e. 24 hourly monitoring for one month in each season except monsoon season.	Two locations in the core mining area and four in buffer area.
2	Noise	Spot Noise level recording Leq (day), Leq (night), Leq (dn)	Periodic / As per CPCB norms i.e. Once in season (1-hourly)	Two locations in the core mining area and four in buffer area.
3	Water Quality	As per drinking water standards	Once in a season except monsoon.	Two locations in the core mining area and four in buffer area.
4	Soil Quality	Analyzed as CPCB method	Once in a season except monsoon.	Two locations in core and two in the buffer area.
4	Health	Total health parameters	Initial Medical Examination (IME) and Periodic Medical Examination – Once in a five year as per Mines Rules, 1955.	All employees

Ambient air quality monitoring

Workspace Monitoring

The concentration of air born pollutants in the workspace / work zone environment will be monitored periodically. If concentrations higher than threshold limit values will be observed, the source of fugitive emissions will be identified and necessary measures will be taken as detailed in EMP.

The ground level concentrations of PM_{10}, $PM_{2.5}$, SO_2, NOx and CO in the ambient air will be monitored at regular intervals except monsoon. Monitoring locations will be decided on the meteorology of the area, topography potential of receptors in the core and buffer area locations. Any abnormal rise will be investigated to identify the causes. Greenbelt will be developed for minimizing dust propagation.

Monitoring of water quality

Monitoring of Ground Water: The monitoring of groundwater is the most important tool to find out the depletion in level of water table. Water table will be monitored at regular interval to check the behavior pattern of the water table. It is suggested to collect water samples and analyze. Records of analysis will be maintained.

Monitoring of Surface Water: Samples will be collected from well-mixed section of the river (main stream) and will be analyzed. There are two locations to collect the samples from the surface water. The objective is to collect the water samples in up-stream and down-stream of the river and analyzed for physical, chemical and biological parameters to study the seasonal variation of water quality except monsoon.

Monitoring noise levels

Potential receptors of Noise levels in the core and buffer areas are identified based on the present noise levels and proposed increment. Noise levels in the work zone environment shall be monitored. The frequency will be once in three months (one season) in the work zone. Noise monitoring will be conducted in three seasons except monsoon with monitoring frequency once in a season carried on hourly basis for 24-h representing site, human settlements, close to high ways, commercial and residential areas and for the industrial area (if any). Similarly, ambient noise levels near

habitations will also be monitored once in three months. Audiometric tests will be conducted periodically for the employees working close to the high noise sources.

Reporting schedules of the reporting data

It is proposed that voluntary reporting of environmental performance with reference to the EMP will be undertaken.

The Environmental Monitoring Cell will co-ordinate all monitoring programs at site and data thus generated will be regularly furnished to the State regulatory agencies/ State Pollution Control Board at the frequency of six month. The Environmental audit reports will be prepared for the entire year of operations and will be regularly submitted to regulatory authorities.

Conclusion

Post Project Environmental monitoring is an essential tool in Environmental Management Program to check Environmental Quality status through monitoring of Environmental parameters as per frequency and method recommended by CPCB. It helps environmental planners, policy makers, managements, scientists and technologists to make amendment at the appropriate placers for clean technology and green environment. Mitigation measures are applied at the various stages; fuel, technology and house-keeping and waste management. Mitigation may be in form of technology up-gradation, design modification or modification in environmental policy. Environment works on cause -and -effect relationship. Clean technology will provide green environment. Clean mining activity will be required for sustainable growth.

The Environmental Monitoring Cell will co-ordinate all monitoring program, environmental awareness program, training and its importance in proposed project at site. Data generated will be furnished as per statutory requirements in CTE/CTO and the environmental conditions. The frequency of monitoring will be one month in each season except monsoon. Half yearly report will be submitted on June and January of each year to the Regional Office of MoEF &CC, Odhisa. The Environmental audit reports will be prepared for the entire year of operations and will be regularly submitted to regulatory authorities. Objective of entire process will be to improve environment and reduce the impact of project / project activities on environment.