ENVIRONMENT MANAGEMENT PLAN

TARKABEDA BLACK STONE QUARRY NO-2

Over an area of 5.00 Acres 2.023 hect. in
Village- Tarkabeda under Hindol Tahasil of
Dhenkanal district, Odisha

Applicant

Tahasildar Hindol
(On behalf of successful bidder)
At/PO- Hindol
Dist- Dhenkanal
State-Odisha

1.0 Introduction

An Environmental Management Plan is a site-specific plan developed to ensure that all necessary measures are identified and implemented in order to protect the environment and comply with environmental legislation. Environmental Management Plan (EMP) will be formulated with an objective to mitigate the adverse impact of any proposed project. This includes an environmental policy on protection of environment and public safety.

The requirement for road metal has been increased over the last few decades due to rapid industrialization and various constructions activities.

Quarry lease for minor mineral (Stone/Road metal) has been proposed to be granted by the Tahasildar, Hindol to the successful highest bidder only after obtaining statutory clearances like mining plan and environmental clearance for a period of five years.

For obtaining Environment clearance The Tahasildar, Hindol has prepared the Mining Plan through RQP and got its approval from the concerned officer. The PFR as per the MOEF Guidelines has also been prepared.

As per Government of India notification regarding environmental clearance notification of 14th September 2006 and its subsequent amendment issued by MoEF & CC, Govt of India, the lessee is intended to obtain Environmental Clearance from State Environment Impact Assessment Authority (SEIAA), Odisha for a total production capacity of 50110 cum of road metal.

2.0 Brief Description of the Project

Project Location

The lease area where the mining will be done is located in the village Tarkabeda. Tarkabeda Black Stone Quarry No- 2, the lease area is present in Tarkabeda village under Hindol Tahasil. It is present in the Toposheet no. F45T6 on the scale of 1:50,000. The nearest town is Dhenkanal at a distance 39km and district head quarter is located at a distance 39km from the lease area.

Table 1: Description of the Project

Sl. No.	**Particulars**	**Details**
1.	Nature of the Project	Tarkabeda Black Stone Quarry No- 2, Village- Tarkabeda, Tahasil- Hindol, Dhenkanal.
2.	Lessee	Tahasildar, Hindol (On behalf of successful bidder) At /Po- Hindol Dist- Dhenkanal Odisha
Size of the Project		
3.	Mining Lease Area	2.023 Ha.
4.	Production Capacity	50110 cum
5.	Period of Mining	5 Years

<table>
<tr><td colspan="6">Project Location</td></tr>
<tr><td>6.</td><td>Village</td><td colspan="4">Tarkabeda</td></tr>
<tr><td>7.</td><td>Tehsil</td><td colspan="4">Hindol</td></tr>
<tr><td>8.</td><td>District</td><td colspan="4">Dhenkanal</td></tr>
<tr><td>9.</td><td>Toposheet No.</td><td colspan="4">F45T6</td></tr>
<tr><td rowspan="2">10.</td><td rowspan="2">Khata No., Plot No. & Kissam</td><td>Village</td><td>Khata No.</td><td>Plot No.</td><td>Kissam</td></tr>
<tr><td>Tarkabeda</td><td>274</td><td>3494/1</td><td>Patharbani</td></tr>
<tr><td>11.</td><td>Latitude& Longitude</td><td colspan="4">The lease area is bounded by latitudes of 20^o 44’ 11.16” N to 20^o 44’ 16.38” N and longitudes of 85^o 17’ 25.18” E to 85^o 17’ 36.59” E.</td></tr>
<tr><td colspan="6">Environmental Settings of the Area</td></tr>
<tr><td>12.</td><td>Nearby Villages</td><td colspan="4">Tarkabeda</td></tr>
<tr><td>13.</td><td>Sanctuaries/National Parks</td><td colspan="4">No Sanctuaries /National Parks within 10km</td></tr>
<tr><td>14.</td><td>NH /State Highway</td><td colspan="4">NH-55 is located at 5km from lease area and SH64 is at the distance of 12.8km from lease area.</td></tr>
<tr><td>15.</td><td>Archeological Sites</td><td colspan="4">No Archeological Sites within 10km.</td></tr>
<tr><td>16.</td><td>Railway line</td><td colspan="4">Hindol Road Railway Station is at a distance of 12 KM from the lease area.</td></tr>
<tr><td>17.</td><td>Nearest Check dam or reservoirs or lake or</td><td colspan="4">Nearest Pond is present at Tarkabeda at a distance of 0.7Km.</td></tr>
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	ponds.	
18.	Air link	The nearest airport is at Bhubaneswar (Biju Patnaik Airport) which is at a distance of 91 km from the project site.

2.1 Mining Details

DETAILS OF THE LEASE AREA

The given area is on Khata no. 274, Plot No. 3494/1 of Tarkabeda Village, Hindol Tahasil, Dist: Dhenkanal, Odisha. The Kisam of land is "Patharbani" and is a lease plot belonging to Govt. of Odisha.

Open cast Semi mechanized method of mining will be adopted during the mining operation. Drilling and blasting will be carried out to disseminate the hard rock into smaller fragments using compressor and jack hammer. During the plan period a systematic development of benches of 5m height and the width of the benches will be kept at more than height. The road metal will be loaded from the quarry by excavator and transporting will be done by trucks. The development is proposed to be 38 nos. of man power (2 supervisory and 36 non-supervisory) will be deployed in the excavation of road metal. Mining activity shall be carried out for 260 days. It has been estimate that monthly production of road metal will be around 1206 cum during the plan period.

3.0 Anticipated Environmental Impacts and Management Plan

In order to minimize impacts of mining on air and to maintain it within the prescribed limits of CPCB/SPCB, an Environment Management Plan (EMP) has been prepared. This will help in resolving all environmental and ecological issues likely to cause due to mining in the area. Environment Management Plan, which is to be implemented in the project has detailed under the following heads:

- Land use pattern
- Air Environment
- Water Environment
- Noise Environment
- Solid waste Management
- Soil Environment
- Biological Environment including Plantation Development
- Implementation of EMP and Monitoring Programme

3.1. Project description with process details (a schematic diagram/flow chart showing the project layout, components of the project etc. should be given.

Mining of road metal will be worked out by open cast method of mining. Handling of rock mass/chips will be done both by manually and by excavators. Controlled blasting will be required during the mining operation.

Drilling & Blasting will be adopted for loosening the Hard Rock mass.

Conventional method of mining will be adopted. Further details are given in mining plan attached.

Machinery required to be deployed in the present plan period

As per the approved mining plan the details of the machinery required for mining is as per the table below:

Sl. No	Machine	Capacity	No. of Units
1	Drill machine	4" dia LM100	1
2	Compressor	450 cfm	1
3	Rock breaker	220 T	1
4	Excavator	220T	2
5	Tipper	15MT	2
6	Water Carrier	2000ltrs	1
7	Mobile camper	---	1
8	Safety equipment such as Helmets, safety shoe, googles and hand gloves	---	AS required

Raw material required along with estimated quantity, likely source, marketing source of final product, mode of transport of raw material and finished product.

The road metal will be transported on road through covered tippers/trucks compatible to pollution standards.

Resource optimization/recycling and reuse envisaged in the project, if any, should be briefly outlined.

The waste so generated from this mining is a ground rock road metal of coarse grained nature, which is used as filling material as well as along with other construction materials. The waste material so generated will be utilized for construction of approach road.

Availability of water its source, Energy/power requirement and source to be given.

About 1KLD of water will be required for the project for the purpose of domestic use. This will be sourced from nearest ground water source.

Quantity of wastes to be generated (liquid and solid) and scheme for their management/disposal.

The waste so generated from this mining is a ground rock road metal of coarse grained nature, which is used as filling material as well as along with other construction of approach roads.

	Mine Closure Plan		
a)	Describe the process / activities to be undertaken for reclamation and rehabilitation in respect of following		
i)	Mined out land	:	Quarry will cover about 0.675Ha. At the end of the plan period. Based on the reserve estimation, no reclamation of the quarried out voids is proposed.
ii)	Waste / reject dump	:	A total 5565 m^3 per annum waste / rejects are likely to be generated. However this wastes will be disposed quarterly as per the requirement to the users end for construction of approach road.

iii)	Plantation Program	:	It is proposed to develop a green belt area along the periphery of the quarry lease area during plan period. A total 720 nos. of sapling is proposed to be planted over 0.45 Ha. along the lease boundary. Also avenue plantation is proposed near the quarry area.

Connectivity:

The area can be approached through katcha road from the Highway, the area can be approached on a black topped road (NH) in South direction over a distance of 10 km to reach the proposed site. Nearest railway station is Hindol Road which is 10 km from the project site.

(ii) Land form, Land use and Land ownership.

The land of proposed quarry is of 2.023 Acre of Patharbani kissam.

The area is not coming under forest & owned by Govt. of Odisha. No forest area is involved in the allocated lease area.

(iii)Topography (along with map)

Topo sheet showing total area are coming under F45T6 is given in 1:50,000 scale.

(iv)Existing infrastructure

Quarry is connected by a katcha road to the sub connected balck topped road

(v) Soil classification

The deposit belongs to recent to sub recent age and overlies directly on Tertiary and having exposure of Pre-Cambrian granites. The soil is derivative of weathered granites in the area. General soil types vary from Silty Road metal to Road metal clay with grayish brown color having medium porosity. The top soil varies from 8" to 14" below ground level in this area.

(i) Climatic data from Secondary Sources:

The Climate of Dhenkanal which is located at 39kms from the quarry site can be taken as a reference to describe the climate of the Quarry Site. The Dhenkanal lies on 84m above sea level. The climate is tropical in Dhenkanal. In winter, there is much less rainfall in Dhenkanal than in summer. This climate is considered to be Aw according to the Köppen-Geiger climate classification. The average annual temperature is 27°C/80.5°F in Dhenkanal. The rainfall here is around 1472 mm/58.0 inch per year. The driest month is December. There is 5 mm/0.2 inch of precipitation in December. With an average of 333 mm/13.1 inch, the most precipitation falls in August. With an average of 32.2 °C/90.0 °F, May is the warmest month. December has the lowest average temperature of the year. It is 21.0 °C/69.8 °F. The precipitation varies 328mm/13 inch between the driest month and the wettest month. During the year, the average temperatures vary by 11.2 °C/52.2 °F.

Social Infrastructure Available:

There is no habitat within 0.5 km radius of the mining site. However the Tarkabeda village is at 1 km distance from the site. There is a primary health care center, Market facility available at Tarkabeda and educational institutes

are available at Dhenkanal. This area is directly connected to as the nearest center of emergency and essential goods. Dhenkanal is the nearest town for this area. The village roads and all access roads are pucca in nature and is well maintained.

Details of alternate sites considered and the basis of selecting the proposed site, particularly the environmental considerations gone into should be highlighted.

No alternate site is considered**.**

(i) Planning concept (type of industries, facilities, transportation, etc) town and country planning/development authority classification

The project is a road metal excavation quarry coming under minor mineral. Road metal is to be excavated by Semi-mechanised means. Transportation is planned on road by covered tippers & Trucks. The area is coming under administration of Tahsildar Hindol. The lease area demarcated by the RI on field with the help of existing revenue village sheet.

Population projection:

The manpower requirement will be 38 nos. only hence, no colony is envisaged.

(iii) Assessment of Infrastructure Demand (physical & social):

The project is a small road metal excavation project. So, transporting this small amount of material will not require expansion of existing infrastructure in other words the existing infrastructure is adequate to transport excavated road

metal. Existing social infrastructure as has been stated above will take care of this incremental manpower.

(iv) Amenities and facilities:

No additional amenities and facilities will be needed.

PROPOSED INFRASTRUCTURE

This being a small road metal excavation and transportation project no, infrastructure like construction of buildings, extension of roads or setting of school, colleges and hospitals are not envisaged. However, approach road to road metal quarry has to be constructed utilizing the same road metal. In safety zone there will be no excavation / mining. The temporary haulage road will be constructed by the proponent.

Proposed Annual Production of stone

The production schedule is as per the approved plan for the extension period as given below:

Year	**Production of Road Metal Volume(Cu. M)**	**Waste (Cu. M.)**
1st Year	10022	1113
2nd Year	10022	1113
3rd Year	10022	1113
4th Year	10022	1113
5th Year	10022	1113
Total	**50110**	**5565**

Therefore based on the production and utilization of the product the revenue from this mine shall be estimated. Further, the product from this mine is subjected to be used in the road & Building construction.

3.2 Air Environment

In this mining activity, the only source of gaseous emission will be from the engines of vehicles. The reasons may be quality of fuel, improper operation of the engine, etc. proper maintenance of engines will improve combustion process and brings reduction in pollution. The fugitive dust generation during mining and transportation requires some mitigation.

- Proper mitigation measures like water sprinkling on haul roads within the lease area will be adopted to control fugitive dust emission.
- Upmost care will be taken to prevent spillage of road metal from the trucks.
- Overloading will be prevented. The trucks/ tippers will be covered by tarpaulin.
- Plantation will be carried out on the roadside areas as well as along the lease boundary.
- To control the emissions regular preventive maintenances of equipment will be done to adopt corrective actions wherever needed.
- It will be ensured that all transportation vehicles will carry a valid PUC certificate.

3.3 Noise Environment

The project area is generally represents calm surroundings. There is no heavy traffic, industry or noisy habitation in the area. No other mining lease area is within 500m of the proposed Stone Quarry. Road metal will be carried out

loaded from the quarry by excavators and transporting by trucks in the working area. Thus no sound is expected other than the vehicular movement and following mitigation measures shall be adopted for the purpose;

- No other equipment except the excavator and transportation vehicles will be allowed into the lease. Noise generated by these equipment will be intermittent and does not cause much adverse impact.
- Proper and regular maintenance of the vehicle will be undertaken to suppress the frictional noise.
- Plantation will be carried out on approach roads & in the safety zone. The plantations will not only minimize propagation of noise but also arrests dust.

3.4 Water Management

Mining in the lease area will be done up to a depth of 5m, which will be well above the ground water table.

- The mining from road metal does not have any impact on topography and natural drainage of surrounding area as no part of land outside the lease area will be disturbed and the void formed due to excavation.

3.4.1 Waste Water Management

- A total 5565m^3 waste / rejects are likely to be generated during the plan period. Generated waste will be utilized for construction of approach roads.

3.5 Soil Environment

No major impact on soil of the study area is envisaged due to mining activities since there is no stack emission. Fugitive emission shall remain confined locally

within working area and emission at haul road will be controlled by water sprinkling and plantation.

3.6 Solid Waste Management

No solid waste /will be generated from the said mining operations. The generation of over burden & top soil are proposed to be nil.

- Unwanted material including mineral or spillage (if any) will not be stacked on the banks sides as it will hinder the flow of water in monsoon season. The unused road metal will be backfilled in the mined out area.
- There is no toxic element present in the mineral which may contaminate the soil.
- Workers will be strictly prohibited to throw leftover food particles and polythene in the lease area and into the river bed.

3.7 Biological Environment Including Plantation Development

3.7.1 Floral and Faunal Environment

The project is only of extraction of minor minerals viz. road metal from the quarry.

- There will be no significant impact of the mining project on the biological diversity found in the 10km. radius of the site.
- The mining lease area is in non-forest land i.e. road metal where presence of fauna is very rare. As such, there will be no adverse impact of the semi-mechanized mining activity on fauna around the mining lease area.
- No adverse impacts will be envisaged on the existing aquatic flora & fauna, if any, on downstream side (away from site) as the mine workings

confined to above water level only and at all touching/disturbing water table.

- The leasehold area is totally covered by road metal and not having any tree, only some shrubs are grown in the soil and alluvium covered area. So there is no chance of uprooting of any tree due to mining operation.

3.7.2 Plantation Development

Plantation will be developed in the safety zone along 7.5 m from the lease boundary by using 480 saplings along the approach roads and at an interval of 2.5m. Thick plantation will work as a pollutant arrestor, reduces floods as well as avoids the situation of erosion of soil during monsoon season. The plant species identified for plantation are Nima (*Azadirachta indica*), Amba (*Mangifera indica*), Panas (*Artocarpus heterophyllus*), Agasti (*Sesbania grandiflora*), Karanja (*Pongamia pinnata*), Siris (***Albizia lebbeck***), babul (***Leucaena leucocephala***), etc.

3.8 Implementation of EMP and Monitoring Programme

The environmental management plan has been developed with a view to bring down the levels of impacts as discussed in the last chapter within limits. In each of the areas of impact, measures have to be taken to reduce potentially significant adverse impacts and where these are beneficial in nature, such impacts are to be enhanced /augmented so that the overall adverse impacts are reduced to as low level as possible.

Table 2: Environmental Monitoring Programme

Sl. No.	Description	Frequency of Monitoring
1.	Ambient Air Quality in and around mines	One Sample after 24 hours continuous monitoring will be collected twice a week in every year during mining period or as per norms of SPCB, Odisha
2.	Water Quality	Annually once for 2 surface water samples during mining period or as per norms of SPCB, Odisha & MoEF for various parameters
3.	Noise Level Monitoring	Once in every year for 24 hours during mining period or as per norms of SPCB, Odisha & MoEF.

3.8.1 Budget for EMP and Monitoring Programme

To evaluate the effectiveness of Environmental Management Programme, regular monitoring of the important environment protection activities will be taken up. A budget of Rs 160,000.00 shall be assigned for the purpose. The details break up cost for implementing the environmental protection measures is given below;

Table 3: Environmental Management Programme

Sl. No.	Activity	Cost /annum (IN Rs.)
1.	Pollution control (Dust suppression)	Rs 30,000
2.	Environmental Monitoring	Rs 30,000
3.	Green belt	Rs. 15,000
4.	Reclamation of mined out area	Rs 30,000
5.	CSR Activities	Rs 20,000
6.	Haul Road Repair	Rs 15,000
5	Miscellaneous	Rs 15,000
Total Expenses		**Rs 160,000**

SUMMARY

Fugitive emission in the form of dust shall be generated during handling and loading of Road metal. The adequate preventive measures will be adopted to contain the various pollutants within permissible limits. Plantation development will be carried out in the mine premises, approx. 480 trees. It will prove an effective pollution mitigate technique, and help avoid soil erosion during monsoon season. Employment opportunities will be provided to the local villagers to improve their live hood.

FINAL RECOMMENDATION

Post-Project Environmental Monitoring is an essential tool in Environmental Management Program to check the environmental quality status through monitoring of environmental parameters as per frequency and method recommended by CPCB. It helps environmentalist and policy makers to maintain the status of the green environment. It will help sustainable growth through clean mining activity.

The environmental cell will co-ordinate all monitoring program, Environmental awareness Program, Training and its importance in proposed project at site. Half-yearly report will be submitted on June and January of each year to the regional office of MoEF / CC, Odisha. Objective of the entire process will be to improve environment and reduce the impact of project activities on Our Environment.

The proposed Environmental Management Plan will keep the area in a safe environment with negligible impact on the environment. The Plantation will substantiate the impact due to the mining activity.

The Lessee shall pay 5 % of the royalty to the authority towards environment management fund.