

EXECUTIVE SUMMARY

1.0: INTRODUCTION

Bichhia Laterite & Fire Clay Mine is granted under ML to Shri Prakash Sondhiya s/o Sri Ram Dulare Sondhiya over an area of 9.084 ha at Village: Bichhia, Taluka: Murwara District: Katni, Madhya Pradesh.

As per the EIA notification of Ministry of Environment and Forests, Govt. of India (MoEF), dated 14th September 2006 amended in December 2009, 4th April 2011, the project falls under category 'B' project under activity 1(a).

The mining plan of Laterite & Fire Clay Mine was approved under rule 22 of MCR'1960 from the office of Regional Controller of mines, Indian Bureau of Mines; letter dated 25.02.2004. The Draft EIA-EMP is prepared as per the TOR granted vide letter No. **311/PS-MS/MPPCB/SEAC/TOR (93)/2012 dated 22.06.2012**(Case no.672/2012) under the EIA Notification. The area is granted under ML for 20 years period vide state govt. order No. F3-5/2003/12/2 dated 15.07.2004 up to 13.09.2024 under the provisions of MMDR Act 1957.

The lessee proposes to do production of Laterite and Fire Clay up to 75,000 TPA.

2.0 BRIEF DESCRIPTION OF THE PROJECT

The mining lease area is located in Village: Bichhia, Taluka: Murwara, District: Katni, Madhya Pradesh.

Latitude	:	23° 44' 40.1'' to 23° 44' 53.1'' (N)
Longitude	:	80° 28' 4.5'' to 80° 28' 15.3'' (E)

The lease area is 20 km from Distt. Headquarter Katni (M.P.) towards south-east by road. It can be approached from Katni the ML area is via Chaparwaha, Gatakhera and Keolari towards Deori Hatai. It is PWD road. Nearest railway station is Jhalwara 2.5 km and airport 100 km away from the project site by road.

2.1 SALIENT FEATURES OF PROJECT

Name of the applicant	Mr. Shri Prakash Sondhiya. S/o Ram Dulare Sondhiya
Name & Address of Lessee	Bichhia Laterite & Fire Clay Mine R/o. Nai Basti P.O. & District – Katni (M.P.) Pin Code – 483501
Name of Mine	Bichhia Laterite & Fire Clay Mine
Village	Bichhia
Taluka	Murwara
District & State	Katni, Madhya Pradesh.
Latitude	23° 44' 40.1" to 23° 44' 53.1" (N)
Longitude	80° 28' 4.5" to 80° 28' 15.3" (E)
Mineral	Laterite & Fire Clay
Area (ha)	9.084
Postal Address	Bichhia Laterite & Fire Clay Mine Sri Prakash Sondhiya S/o. Shri Ram Dulare Sondhiya R/o. Nai Basti P.O. & District – Katni (M.P.) Pin Code – 483501 Mob. - 07898663377
Period of Lease (Yrs)	20 Years up to 13.09.2024
Status of Mine	Existing

2.2: GEOLOGY

i. Regional Geology

Geologically, the Katni region (around-50 km) comprises the rock of different geological ages. The regional trend of rocks is north east-south west. These have been intruded by basic and acidic intrusives. Structurally, both primary and secondary structures have developed. Primary structures developed are primary bedding current etc. Secondary structures are faults, folds, joints, foliation etc. The rocks have been subjected to polyphase deformation and joints have developed.

According to the District Resource Map, Geological Survey of India classification of different formations exposed in this area with their order as super imposition is as under. The lease area is undulating having gentle slope towards north. The highest elevation of the lease area is 442 m R.L. towards south west direction and the lowest elevation is 412m R.L. in north east direction. The lease area is drained by north westerly flowing Jarangar Nadi in N-E of the lease area at about 1.0 km distance.

ii. Local Geology

The deposit of Mahakaushal Group is found in the applied area overlain by rocks of Tertiary group comprising of Laterite & Clay. On the basis of geological mapping, Survey study of different pit section and sub-surface exploration by pitting, the deposit may be divided into different Lithological zones with their order of superimposition as identified in the area is as below:

Over burden Lateritic Soil	-	up to 0.10m
Laterite	-	upto 5.0m
Lithomargic Clay		

A brief description of the individual zones is as follows: -

Laterite: -Laterite is mottled red or brown coloured scoriaceous rock with a vermicular structure near the surface, it is found as a capping over a large variety of rocks in areas subject to the tropical monsoonal and subtropical regime of climate. Desilication of preexisting sandstone is more possible explanation for Laterite formation. It is essentially a mixture of the hydrated of

aluminium and Iron, partly soft and can be stressed easily but when it is exposed to the air it hardens quickly. Its bulk density is equal to 2.8. It has no well defined strike and dip.

2.3 TOPOGRAPHY

The lease area is undulating having gentle slope towards north. The highest elevation of the lease area is 442 m R.L. towards south west direction and the lowest elevation is 412m R.L. in north east direction. The lease area is drained by north westerly flowing Jarangar Nadi in N-E of the lease area at about 1.0 km distance.

2.4 RESERVES

Probable Mineral Reserve	122	745478
Pre-Feasibility Mineral Resource	222	84752

2.5 BASIC REQUIREMENTS FOR THE PROJECT

S. No.	Requirements	Quantity	Source
1	Land	9.084 ha	Govt. revenue land
2	Water	15 KLD	Private water suppliers and water collected in the pits of mine.
3	Manpower	50	Majority from nearby villages

2.6 DETAILS OF MINING

ML area	9.084 ha
Mineable Reserve	7,45,478 TPA,
Life of the Mine	11 years
Method of mining	Opencast other than fully mechanized
Bench Height and Width	Height:4.0m Width:4.0m
Depth of Mine	6 m from ground level

2.7 DRILLING AND BLASTING

Drilling and blasting has been proposed of 32mm dia holes upto 1.5m depth. The spacing will be 1.0m and burden 0.8m. No deep hole drilling and blasting of large dia was carried out and hence no ground vibration was felt.

2.8 USE OF MINERAL

Laterite is very readily accepted by the cement industry for use as an additive to produce clinker suitable for the market. Fire clay is a type of clay which is used in the production of heat resistant clay items, such as the crucibles used in metals manufacturing. The principal uses of fire clay are in the manufacture of firebrick and of various accessory utensils, such as crucibles, saggars, retorts, and glass pots, used in the metalworking industries. The industrial use of laterite is in the cement industry. It is used as an additive for lowering the clinkerization temperature and supplementing aluminous and iron contents required in the manufacture of cement.

2.9 LAND USE PATTERN

S.NO	LAND USE	Existing	5 th year end	End of Mine Life
1	Total area excavated (broken)	0.005	1.428	8.1937
2	Area fully mined out (out of 1)	Nil	Nil	8.1937
3	Area fully reclaimed (Backfilled out of 2)	Nil	Nil	8.1937
4	Area rehabilitated out of 3 by afforestation	N/A	Nil	8.1937
5	Area rehabilitated by water harvesting	Nil	Nil	Nil
6	Total area under dumps	0.005	0.3744	Nil
7	Area under active dumps	Nil	0.3744	Nil
8	Area under mineral stack	Nil	Nil	Nil
9	Area under road	Nil	0.10	Nil
10	Area under Green belt (i.e. plantation on area other than dump and backfilled area)	Nil	0.20	0.8903
11	Plantation over dump area	Nil	Nil	Nil
12	Area under infrastructure	Nil	0.10	Nil
13	Protective Bund and Drain	Nil	0.29	Nil

	TOTAL			9.084
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3.0: ENVIRONMENTAL STATUS

The baseline environment quality was carried out over a radial distance of 10 km around the mine during October 2012 to December 2012.

3.1 METEOROLOGY

The Summarized Meteorological Data of the area as per secondary source data for post monsoon period:

Month	Wind Speed (km/h)			Temperature (°C)			Rainfall (mm)	
	Max	Avg	Calm%	Max	Min	Avg	Total	No. of rainy Days
October 2012	7	<1	33.5	36	13	26	11	1
November 2012	7	<1	40.5	31	10	21	0	0
December 2012	7	<1	43	30	3	18	0	0

3.2 AMBIENT AIR QUALITY

Seven air sampling stations were established in the study area including one in core zone and six in buffer zone during monitoring period. The observed values of PM_{2.5} ranged from 33.0 µg/m³ to 45.60 µg/m³ with the 98th percentile ranging between 37.2 µg/m³ to 44.0 µg/m³. PM₁₀ recorded within the study area was in the range of 63.90 µg/m³ to 82.40 µg/m³ with the 98th percentile ranging between 74.90 µg/m³ to 81.50 µg/m³. SO₂ recorded within the study area was in the range of 5.30 µg/m³ to 10.20 µg/m³ with the 98th percentile ranging between 6.8 µg/m³ to 9.9 µg/m³. NO_x recorded within the study area was in the range of 11.70 µg/m³ to 22.40 µg/m³ with the 98th percentile ranging between 15.80 µg/m³ to 21.70 µg/m³.

3.3 NOISE LEVELS

It can be seen that values of noise observed in some of the areas are primarily owing to vehicular traffic and other anthropogenic activities. Assessment of hourly night time Leq (Ln) varies from 37.5 to 43.6 dB (A) and the hourly daytime Leq (Ld) varies from 46.5 to 53.2 dB (A) within the study area.

3.4 WATER QUALITY

To assess the water quality, 4 monitoring stations were set up in which 2 were for ground water and 2 for surface water. All the ground water samples analyzed can be considered fit for drinking purpose in the absence of alternate sources. For surface water quality, comparing the values of pH, DO, BOD and total coliforms with 'Use based classification of surface waters' published by Central Pollution Control Board; it can be seen that all the analyzed surface waters can be compared with class C and can be used as drinking water sources after conventional treatment and disinfection.

3.5 SOIL CHARACTERISTICS

Physical characteristics of soil were characterized through specific parameters viz bulk density, porosity, water holding capacity, pH, electrical conductivity and texture. Soil pH plays an important role in the availability of nutrients. Soil microbial activity as well as solubility of metal ions is also dependent on pH. In the study area, variations in the pH of the soil were found to be neutral (7.49 to 8.12). Electrical conductivity (EC) is a measure of the soluble salts and ionic activity in the soil. In the collected soil samples the conductivity ranged from 291-536 $\mu\text{mhos/cm}$.

The soils with low bulk density have favorable physical condition where as those with high bulk density exhibit poor physical conditions for agriculture crops.

3.6 SOCIOECONOMIC SCENARIO

According to Census 2001, the total population of the study area is 32388 of which 18 percent belongs to 0-6 age group. Of the total population 51.21 percent are male and the remaining 48.79 percent are female. This creates a gender gap of 2.42 percent and the sex ratio works out to 953

females per 1000 males. This is much higher than the national average of 933 females per 1000 males. Since there is no town/city in the study area; the entire population belongs to rural sector. Again, of the total population 11 percent are Scheduled Caste and 32 percent belongs to Schedule tribe. The total population of the study area has been groped into 6425 households and the average household size is 5.

Education Facilities

According to secondary sources three-fourth of the total villages in the study area are provided with institutional educational facility. There are 42 schools in the study area, which include 34 primary schools, 5 middle schools and 2 Secondary school and one senior secondary school. There are no colleges and other schools in the study area. Hence, for higher studies students are forced to go distant towns and cities, where such facilities are available.

Table 6.6: Types of schools in the rural area of the study area

Category of school	Number
Primary school	34
Middle school	5
Secondary school	2
Senior Secondary School	1
TOTAL	42

b. Medical Facilities

The study area is still lacking in required health facility, as only one third percent of villages are having institutional health facilities. The area is mainly served by one Allopathic hospital. Further there is one allopathic dispensary, one Ayurvedic dispensary. The area has also one child welfare center, one public health center and three public health sub center within the radius of 10 km buffer area.

c. Availability of Drinking water

All the villages in the study area are provided with drinking water facilities. An analysis of data reveals wells are the main source drinking water which is available in all the villages. This is followed by Tap (4 villages), Hand pump (35 villages) Tank (4 villages), Tube well (2 villages).

d. Availability of Power

All the villages in the study area are not yet electrified though the rural electrification programme of the Govt. of India is under way. According to census 2001, the project village is having electricity for all the purposes. Out of total 36 villages 20 villages are having power for domestic purposes as well as 17 villages are having power agricultural purposes and 15 villages are having power for all purposes. The power situation in the study area is very critical as there is regular power cut especially in the summer months due to surge in demand.

e. Post office and Telephone

In the study area only 11.11 percent of the villages are provided with Postal facilities. As per secondary report post offices are operating in four villages only. So far as land line phones are concerned, there are twenty two telephone connection in entire area.

f. Banking facilities and Cooperative Credit & Non-credit Societies

In the study area there is only one commercial bank located in the village Deorihatai. Besides the above there is one each agricultural and credit societies. Agricultural Credit Societies and Credit Society is in the village.

3.7 BIOLOGICAL ENVIRONMENT

Detailed survey tours were conducted to evaluate faunal composition of the study area (core zone and buffer zone) within the proposed project area. An inventory of animals of the area is prepared based on our field data as well as the published secondary data from Forest department. During site visit and secondary data was collected from the Forest department to get the correct picture of the study area.

There is neither any wildlife sensitive area nor any corridor for the movement of wildlife present in the study area. Bichhia lies in the Agro climatic zone of Kymore plateau & Satpura Hills and Rice, Jowar, Soybean, Maize are the main crops during kharif season and Wheat, Chilli during Rabi season and the village people are mainly agrarian. Therefore there is no possibility of any impacts on eco-sensitive areas due to the project.

The area comprises of government revenue land surrounded by forest at distance more than 250 m in south west and south east. There are no National Parks, Sanctuaries, Breeding, roosting places or ecologically sensitive areas within the 10 km periphery of the mine lease area, however some RF namely Majhgawan RF, Bijauri RF, Ponri RF, Manpur PF and Gopalpur RF are present within the 10 km periphery of the mine lease area. No wildlife protected area declared protected under “*Wildlife (Protection) Act-1972*” is located within 10 km radius of the proposed mining area.

Vegetation study was conducted in both buffer and core zones. The inventory of plants was prepared through the field visits, personal interviews and group discussion with local people. The species composition revealed that plants are deciduous in nature and in the shrub form; including annual or biannual herbs and with spiny structures Jangli Ber (*Zizyhpus* spp.). Herb included annual, biannual or perennial, herbaceous species. Any species which could not be identified in the field was brought back (flowers/leaves specimen) and cross-checked with the help of expert institutions/resource person. Depending upon the vegetation, pattern of the area, two methods were adopted for the study.

The buffer zone was devoid of any forest however the trees of Mahua (*Madhuca india*) and Mango (*Mangifera India*) and Palash (*Butea monosperma*) have been found on the edges of agricultural fields and along pathways.

4.0: ANTICIPATED ENVIRONMENTAL IMPACTS

4.1 IMPACT ON AIR-Various mining activities i.e. drilling, blasting, loading, removal of overburden and movement of other transport vehicles used in mining will generate dust (SPM / RSPM), The predicted impact on air environment will be significantly reduced by control measures like regular water sprinkling etc, The mineral will be transported by road through

covered trucks/tippers to reduce the fugitive emission caused by the wind.

AIR MANAGEMENT

Following measures will be taken to control air pollution during mining operation:

- Adequate water spraying on the haul roads.
- Construction of proper haul roads in the lease area.
- Development of Green belt/plantation along mine boundary, along the haul roads, mine office to arrest dust.
- Provision will be made to provide dust masks to drillers and persons employed in dusty area.

4.2 IMPACT ON WATER ENVIRONMENT

4.2.1 IMPACT ON SURFACE WATER BODIES- There is no perennial source of surface water such as river or nalla in the lease area. There is only seasonal water courses/nalla in the buffer zone. This drains the surface run off. Garland drain has been proposed towards northern boundary of the ML area to prevent erosion, sedimentation, and siltation. Since there is no river or any perennial water course in the applied area, diversion will not be required. There is no toxic element in and around the applied area or in OB or ore. Hence contamination of any nature is not expected for surface or any ground water source.

4.2.2 IMPACT ON GROUND WATER TABLE- The ground water table in the lease area varies from 28m to 30m. below general ground level of 410m. Mining will be done up to 409m AMSL i.e. 27m above ground water table. Hence ground water table will not be affected. The behavior of ground water table has been noticed to be uniform.

WASTEWATER GENERATION, TREATMENT AND DISPOSAL

The waste water generation from the above consumption is mainly from domestic consumption i.e. the wastewater generated from the domestic front is mainly from toilets. This water is treated in septic tank followed by soak pit.

4.3 NOISE IMPACT

The impact of noise on the villages is negligible as the villages are far located from the mine workings. Since there is no involvement of major machinery, the impact of noise levels will be minimal.

NOISE MANAGEMENT

- All precaution will be taken and noise level survey will be done at regular intervals.
- Ear protectors or earplugs will be given to persons working in higher noise level area or on machines.
- Regular measurement of noise level is proposed near drilling equipment and other heavy earth moving machinery & steps will be taken to improve the maintenance of all equipments so that the noise level will remain within permissible limits.
- Plantation of trees on internal roads and barriers.

4.4 IMPACT ON LAND ENVIRONMENT

Opencast other than fully mechanized mining activities may alter the landscape of the lease area and also cause some disturbance to the surface features of the surrounding areas. The post mining land use pattern of the subject mine lease area of Bichhia Laterite & Fire Clay Mine is given in Table 4.3 of chapter 4

LAND RECLAMATION

Reclamation of mined out area is the most important activity of EMP. As a result of mining operation, the original ground profile will be altered. The mined out land will be properly fenced off. The lateritic soil to be removed will be utilized for topping of the backfilled area on which plantation will be carried out. At the Conceptual stage, the whole area will be reclaimed by plantation.

4.5 IMPACT ON FOREST AND VEGETATION

4 5.1 IMPACTS ON BIODIVERSITY

Present data have been collected through direct inventory as well as 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, faunal migratory routes or eco-sensitive area near the whole study area. Save the flora/fauna around the project area, is one of the basic objective of present project. For this, mine owner agency planted a good roadside plantation along both side of the mine road.

4.5.2 IMPACTS ON AGRICULTURE

Agriculture activities are practiced in the nearby areas may impacted because of dust generation but mitigative measures such as regular water sprinkling on active areas for example haul roads, dump sites should be strictly followed so that impact is minimized.

GREEN BELT/PLANTATION

Green belt will be prepared in 0.8903 ha barren land while plantation in 8.1937 ha reclaimed area will be done. Fruit bearing trees and khamar, Teak, Bamboo, Amla and Gulmohar, mango, kadam Eucalyptus etc. will be planted. Conceptual rehabilitation by plantation will be carried out in 8.1937 ha area. About 18200 trees will be planted.

So far as afforestation is concerned, saplings would be planted at a spacing of 2.5 m along the boundaries of the M.L. area. Local species will be planted in the area as per availability.

OCCUPATION HEALTH AND HAZARDOUS

To avoid any adverse effect on the health of workers due to various pollutants, sufficient measures relating to safety and health will also be practiced:

1. Provision of rest shelters for mine workers with amenities like drinking water etc.
2. All safety measures like use of safety appliances, such as dust masks, helmets, shoes, safety awareness programs, awards, posters, slogans related to safety etc.
3. Training of employees for use of safety appliances and first aid in vocational training center.
4. Regular maintenance and testing of all equipment as per manufacturers' guidelines.
5. Periodical Medical Examination (PME) of all workers by a medical Officer
6. First Aid facility is provided at the mine site.
7. Close surveillance of the factors in working environment and work practices which may affect environment and worker's health.
8. Working of mine as per approved mining plan and environmental plans.

5.0 POST PROJECT MONITORING PROGRAM

SI. No.	Description	Frequency of Monitoring
1	Ambient Air Quality	Quarterly/Half yearly
2	Meteorological data	Daily
3	Noise Level Monitoring	Half yearly
4	Water Level & Quality	Quarterly/Half yearly
5	Soil Quality	Yearly
6	Monitoring of Agricultural crops	Yearly

6.0 ADDITIONAL STUDIES

RISK ANALYSIS AND DISASTER MANAGEMENT PLAN

i. FACE STABILITY

- Over all Slope angle = 45°
- Slope of faces at 70° to 75°.
- Geological structure (fault, fold, foliation, fracture, joints, shear stress) to be studied.
- The height of the bench will be as per MMR 1961 and equal to or less than the width of the bench.

ii. LOADING

- At the time of loading no person should be there within the range of swing of the shovel.
- The Dumpers should stand near the shovel and fully braked when the muck is dumped on it.

iii. FAILURE OF SLOPE IN THE PIT

- Ultimate slope angle = 45°
- Bench height should not be more than the digging height of the shovel. The width of the bench should not be less than the height.

iv REHABILITATION & RESETTLEMENT (R&R)

There will be no resettlement or rehabilitation involved in the project.

7.0 PROJECT BENEFITS

The project will prove beneficial to the people as the lessee will provide infrastructural facilities to the villagers like Educational facilities, Medical facilities, Transportation facilities, water supply etc. which will improve the socio-economic status and environment of the area.

8.0 ENVIRONMENT MANAGEMENT PLAN

The environmental management plan consists of the set of mitigation, management, monitoring and institutional measures to be taken during the implementation and operation of the project, to eliminate adverse environmental impacts or reduce them to acceptable levels. The present environmental management plan addresses the components of environment, which are likely to be affected by the different operations in a mine area.

The mitigation measures which reduce the impact have already been identified earlier. To minimize the adverse impact, certain additional EMP implementation **and organizational setup**

Bichhia Laterite and Fire Clay Mine has proposed to provide financial assistance of Rs One lac/year for the development of social infrastructure of the area.

Following measure will be taken to improve the Social infrastructure of the study area:

- Preventive medical care and educational facilities for rural population shall be promoted.
- Priority will be given to local people for employment. Indirect employment through contractual services shall be provided.
- Extending general benefit by way of development work in the villages through respective Gram Panchayat.
- Supplementing Govt. efforts in health monitoring camps, social welfare and various awareness programmes among the rural population.
- Assisting social forestry programme.