EXECUTIVE SUMMARY OF THE PROJECT

INTRODUCTION

M/s Ashapura Minechem is a Public Limited Company registered under the Companies Act 1956 and is engaged in production of Calcined Alumina as well as in exporting of Metal grade Bauxite for Alumina industries and low-grade Bauxite suitable for Cement Industries

M/s Ashapura Minechem Limited has applied for mining lease over an area of 62.77 ha in the survey nos 4,5,6,7,& 8 in Sakhari Village, Mandangad Taluka, Ratnagiri District of Maharashtra. Prior approval of Government of India is obtained under Sec 5(1) of MMDR Act, 1957 vide letter no 4/73/2004-MIV dated 03.07.2009

The mining lease was granted by Under Secretary to Government of Maharashtra, Industries, Energy and Labour Department, Mantralaya, Mumbai – 400 032, Maharashtra vide letter no MMN-1004/C.R. 654/IND-9 dated 12.08.2009.

M/s Ashapura Minechem Ltd has submitted it's proposal for production 120000 TPA of Bauxite production to Ministry of Environment Forest & Climate Change vide Proposal number IA/MH/MIN/34164/2015.

Honourable EAC, Committee MoEF & CC after going through the project proposal has prescribed TOR's for undertaking detailed EIA study vide Letter No J-11015/98/2016-IA.II (M) dated 15th March 2016

PROJECT DESCRIPTION

Topography

The applied area is a non-forest private waste land. The terrain is sloping towards south.The highest and lowest elevation in the area is having an elevation difference of 195.5m. Highest elevation is 210.5m & lowest is 15.0m respectively. A temporary bench mark (TBM) with 195m RL is considered at NW corner of the area. Boundary Pillar 1 I linked with Dargah as GCP Point. BP 41 is linked with Transformer and BP-40 is linked with farm house as Ground Control Point.

Drainage

The area is situated on elevated ground and the area is in mound shape. The area is elevated from the surrounding and there is as such no water sources in the area from which inherent seepage of water occur. The drainage pattern of the buffer zone is dendritic to sub-dendritic in nature. No perennial nallahs or streams are seen within the applied area. The area experiences humid tropical climate and receives as much as 4000 mm of rainfall during the year. The slope of the hill is covered with shrubs.

Salient Features of Mining

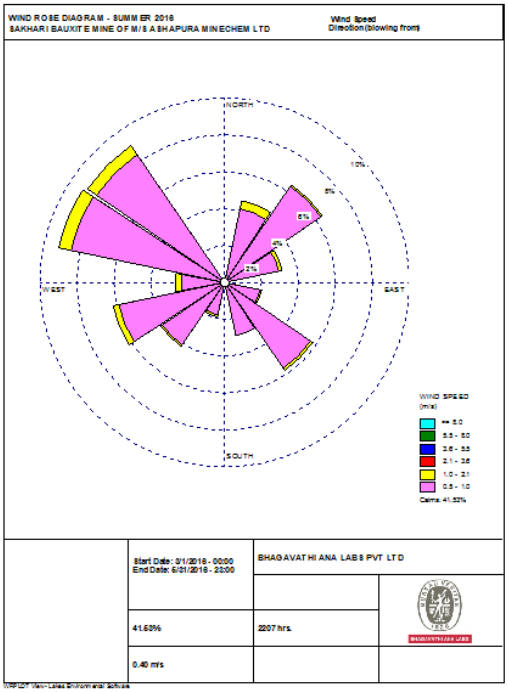
- The proposed project envisages Bauxite ore production of 1.20 LTPA
- It is proposed to carry out opencast mechanized method with drilling and blasting operation.
- A bench height of 1.5 to 2.4 m depending on the proved depth and 100m influence on all sides of an individual pit will be maintained.
- The gradient of level roads shall be kept at 1:16.
- The mining operations shall be carried out in single shift of 8 hours for 200 days in a year.
- With a maximum annual production of 1.20 LTPA and mineable reserves as 33.55 lakh tonnes the life of the mine is estimated as 28 years (approx.)
- The employees required for the project are 49 nos. Since the transport of bauxite is done by hired vehicles about 50 people of adjoining villages are indirectly associated with this transport system and also petty contingent works connected with mining.
- Total water requirement in the mine is about 12 KLD.

DESCRIPTION OF THE ENVIRONMENT

Meteorology (summer 2016)

Season	Predominant Wind Direction	Average Wind Speed (m/s)
Summer 2016	WNW	0.4

WIND ROSE DIAGRAM



Ambient Air Quality

The scenario of the existing Ambient Air Quality in the study region has been assessed through a network of 8 Ambient Air Quality locations during summer 2016 (March – May 2016). The summary of Ambient Air Quality monitoring results are given below.

Summary of Ambient Air Quality (Units: µg/m^3 except CO mg/m^3)

LOCATION	PM_{10}	$PM_{2.5}$	SO_2	NO_x
Ambavalli	48.7	19.4	11.7	14.4
Mine Lease Area	47.1	18.8	12.8	13.8
Sakhari	51.6	21.3	14.9	15.3
Vanjloli	50.4	20.5	14.0	15.1
Umbershet	51.8	21.6	14.6	14.8
Velas	52.6	22.2	15.1	16.2
Kataiwadi	55.0	23.0	15.7	17.2
Kelshi	52.5	21.4	14.3	16.7
NAAQ Standard (Core & Buffer Zone)	**100**	**60**	**80**	**80**
Source: Primary Data collected by Bhagavathi Ana Labs Pvt Ltd.				

Ambient air quality data with in the study area is well within the prescribed standards of National Ambient Quality Standards w.r.t Air

Noise Level

A preliminary survey was undertaken at 10 locations during study period, to identify the major noise generating sources in the area. Summary of noise level data of different locations are given below.

Summary of Noise Levels during Study Period [Units:dB(A)]

Code	Location	Day-Equivalent, Ld	Night Equivalent, Ln
N1	Ambavali	45.2	40.7
N2	Mines	44.5	40.2
N3	Sakhari	46.7	42.3
N4	Vanjloli	46.0	41.4
N5	Umbershet	48.8	44.5
N6	Velas	44.3	40.1
N7	Bankot	43.1	38.8
N8	Kataiwadi	41.3	36.8
N9	Kelshi	43.8	39.5
N10	Uttambar	47.1	42.7
Standards day/night		75/70 (Core Area)	55/45 (Buffer area)
Source: Primary Data collected by Bhagavathi Ana Labs Pvt Ltd.			

Both Day & Night equivalent values observed in the study area were found well within the prescribed standards for residential area

Water Quality

Four surface water and six ground water samples were collected from the study area and tested to know the water quality of study area. Summary of the water quality test results are given below.

Summary of Water Quality Test Results

S. No.	Parameter	Unit	Surface Water	Ground Water	Desirable limits as per IS: 10500
1	pH	-	7.43 – 7.82	7.24 – 8.17	6.5 – 8.5
2	Total Dissolved Solids	mg/l	3172 - 51348	40 - 985	500
3	Total Hardness as $CaCO_3$	mg/l	435 - 7050	15 – 405	300
4	Fluoride as F	mg/l	0.8 – 1.0	0.2 – 1.0	1.0
5	Total Coliform	MPN/100 ml	16 – 33	Absent	Absent
6	Fecal coliform	MPN/100 ml	Nil	Absent	Absent

Perusal of the above table shows that physio-chemical characteristic of the samples analyzed had higher concentration of, TDS and Hardness and were not comparable to the desirable limits of the prescribed drinking water standards IS: 10500 due to proximity to the sea w.r.t surface water but w.r.t ground water hardness and TDS were found to exceed the Desirable limits but within the permissible limits of IS10500

Land Environment

Around 86 % of the ML area will be used for mining and its related activities. The changed land use will be restored back through backfilling and afforestation to maintain proper land during regular mining activity and at the conceptual stage.

Land use pattern (ha)

S.No	Land Use	Present	Plan Period	Conceptual
1	Area to be excavated during Plan Period	Nil	17.04	54.27
2	Storage for top soil	Nil	-	-
3	Overburden dumps	Nil	2.709	-
4	Mineral Storage	Nil	-	-
5	Infrastructure	Nil	0.01	0.010
6	Roads	Nil	0.576	0.576
7	Railways	Nil	-	-
8	Green belt	Nil	0.35	3.53
9	Tailing pond	Nil	-	-
10	Effluent Treatment Plant	Nil	-	-
11	Mineral separation Plant	Nil	-	-

12	Township area	Nil	-	-
13	Unused Area	62.77	42.08	4.38
	Total	**62.77**	**62.77**	**62.77**
Source: Approved Mining Plan page 41				

Soil Quality

Soil samples were collected from 8 locations from the core and buffer zone to evaluate the soil quality in the study area. All the samples are showing moderate - fertile nature of soil quality.

Biological Environment

A primary field study was conducted in core as well as buffer area including coastal close Arabian Sea. The consolidated list of flora and fauna was prepared based on primary field visit and information form published literature and working plan of forest department. Further the survey was made in confirming availability of potential endemic and or endangered fauna, and the likely impact due to proposed project.

During the study it was observed that endangered species of turtles are present in the study area. A conservation plan in detail is presented in the EIA report

Socio-Economic Environment

The socio-economic status (Based on Census 2011) of the villages within the study area is given in table below:

Table: Socio-economic details of the villages in study area

Sr. No	District	Taluka	Number of village
1	Ratnagiri	Mandangad	15
2	Ratnagiri	Dapoli	12
3	Raigarh	Shrivardhan	5
Total	**02**	**03**	**32**

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Ambient Air Quality

Impact on Ambient Air Quality

From the proposed project, dust concentration in the ambient air will increase apart from increase in the concentrations of Sulphur dioxide (SO_2) and Oxides of Nitrogen (NO_X) from diesel operated excavator, loading equipments and vehicles plying on haul roads.

To assess the impact due to bauxite production of 1.20 LTPA from Sakhari Mines on air environment, predictions have been carried out using ISC – AERMOD MODEL.

The maximum predicted value of increase in PM10 due to proposed enhancements in mining operations would be about 8.7$\mu g/m^3$. This concentration will be observed within the core zone of Sakhari mine area where mining operations are being carried out. The concentration was found to reduce to a value of less than 0.5$\mu g/m^3$ at a distance of about 0.5 km from the mining operations.

Air Pollution Control Measures

- Development of 7.5 m wide green belt with tall growing trees and thick foliage cover along mine lease boundary to arrest dust. This will also help in attenuating noise.
- Minimizing dust generation during excavation by water sprinkling at working face.
- Proper maintenance of the haul roads and regular water sprinkling to minimize the generation of air borne dust due to movement of tippers on it.
- Water spraying at the loading and unloading points to reduce fugitive dust emissions.
- Plantation will be carried out on mined out areas.
- Proper maintenance of the equipment and machinery in the mines helps in minimizing air pollution and noise generation.
- Overloading and over-speeding of trucks will be prohibited.
- Mineral transportation will be carried out by trucks covered with tarpaulin.
- Development of thick plantation to reduce the spread of air pollution in surrounding areas.
- Dust masks will be provided to workers working in high dust generating areas.
- Regular & periodic maintenance of deployed machineries, to reduce smoke emission

Noise Level

Impact on Noise Levels

Noise will be generated due to working of HEMM, drilling and blasting activities, mineral and waste transport, etc. It is calculated that due to mining activities the noise level at boundary will be less than 38.97 dB (A).

Impacts due to Blasting

Considering the Quantity of Explosive to be used and distance from the blasting area to the nearest habitation the Ground vibration will have negligible effect on the domestic structures

Control Measure of Noise Pollution

Noise levels will be kept within acceptable limits by:

- Limiting of speed of haulage vehicles/tippers.
- Regular maintenance of transport vehicles.
- Usage of sharp drilling bits and delivery of compressed air at optimal pressure during drilling

- Provision of earmuffs/ear plugs to workers in noise prone zones in the mine.
- Plantation along the mineral transportation roads in nearby villages.

Control Measures for Ground Vibrations and Fly Rock

To keep ground vibration due to blasting well within the above mentioned prescribed limits of DGMS and to avoid fly rocks, following measures will be adopted:

- Controlled blasting using delay detonators will be carried out.
- Drilling and blasting will be carried under the supervision of qualified persons.
- Slurry explosive will be used which has low velocity of detonation, which reduces ground vibrations and fly rocks.
- Overcharging of the blast holes will be avoided
- Suitable spacing and burden will be maintained to avoid misfires/ fly rocks.
- Number of blast holes will be restricted to control ground vibrations.
- Blasting will be carried out only during noon time.

Water Environment

Water Consumption

Water in the mine is mainly required for dust suppression, plantation and domestic use. Total water requirement in the mine is about 12 KLD which will be sourced from ground water. Rainwater accumulated in mine pits, whenever available, will be used for dust suppression and plantation.

Impact on Water Environment & Mitigation Measures

Mining activities cause adverse impacts due to mine drainage, siltation due to storm water and contaminated water from domestic sewage water.

There is no wastewater generation from mine.

Impact on Ground Water

The proposed area is situated on elevated ground The mining operation are proposed to be carried out upto 4m below the surface level. The ground water table is around 15m bgl. Hence, intersection of ground water table is not anticipated during the proposed mining operations

Impact on Surface Water Bodies

There is no perennial surface water body within the mine lease area. There will not be any accumulation of surface water during rainy season as the proposed area is having the hilly topography. The rain water will be drained out due to gravity of drainage through the relief slopes of the area. Apart from this there will not be any other source for surface water in the area.

The surface run-off from broken areas in the mine lease area during monsoon may cause siltation of the surface water bodies outside the mine lease area. There is no

process effluent generation in the mine lease area. Hence, there is no disposal of effluent in the surface water bodies.

Mitigation Measures

A garland drain is proposed surrounding the mine workings to collect any run off from the mine workings. The discharge from these drains will be diverted to a settling tank/ pit workings, which allows the sediments to settle. Further to arrest the silted drainage entering into the seasonal nallahs originating from the hill ranges the area, check dams and gully plugs will be erected with in the proposed ML area, in the existing natural drains. These check dams also assist in the recharge of ground water system.

It is proposed to construct 4 check dams, 4 settling ponds and number of gully checks at strategic locations to arrest silt wash off.

Land Environment

Impact on Land use and it's Management

Around 86 % of the ML area will be used for mining and its related activities. The changed land use will be restored back through backfilling and afforestation to maintain proper land during regular mining activity and at the conceptual stage.

Impact on Biological Environment and it's Management

The tree species found within the core zone represent the common type of flora species along with small shrubs and bushes. Due to mining activities community structure of the vegetation will not change. But the number of plant species of the area will be reduced due to the clean-up of the land for different mining activities. With the provision of retention walls, garland drains, supply of water for irrigation, establishment of greenery over the backfilled areas, there shall be reduction in soil erosion and improvement in vegetation growth. Thus the quality of land use will also improve.

The project authorities aim to reclaim majority of mining lease area with better environmental quality indices by raising of maximum plantation compared to the present scenario by backfilling major portion of the mined out area and growing vegetation and creation of water storage reservoir in the balance portion of the worked out pit. Thus the project shall ultimately contribute to the improvement of the eco system of the region.

Socio- Economic environment

The mine management will take necessary air pollution control measures like green belt plantation, regular water sprinkling, controlled blasting, etc to control air pollution due to the mining activities. Regular water sprinkling will be carried out on haulage roads used for mineral transport. Mineral transportation will be carried out in trucks covered with tarpaulin. Speed of the transportation trucks will be regulated. Plantation will be carried out along the mineral transport roads. Regular air quality monitoring will be carried out in nearby villages to assess the efficacy of the air pollution control measures adopted in the mine.

Noise from the mining activities will be controlled by regular maintenance of the mining machinery and transport vehicles. Silence zones will be declared near village habitations. Speed of the transport vehicles will be regulated. The mining and mineral transportation will be carried out only during day time.

Awareness programs will be conducted in nearby villages for road traffic and safety. Only trained drivers will be deployed for mineral transportation activities. The roads used for mineral transportation will be widened, strengthened and will be regularly maintained by the company.

ENVIRONMENTAL MONITORING PROGRAMME

Monitoring of ambient air quality, ambient noise levels, surface and ground water quality, soil quality, plantation and green belt in the mine lease area, etc. will be carried out as per the applicable guidelines and the reports will be submitted to the corresponding regulating authorities. An Environment Management Cell will be formed for implementation of the monitoring programme and the environmental management plan.

PROJECT BENEFITS

The people residing in the nearby villages will get following benefits:

- Direct and indirect employment opportunities
- Drinking water, Medical and educational facilities
- Improved communication and infrastructure facilities
- Vocational training to women
- Compensation for loss of land / house

Need based Assessment

The villagers were contacted during the socio-economic survey and were discussed regarding their expectations from the company. The major expectations are given below:

- Employment to local people in the company
- Education Facilities
- Drinking & Irrigation Water Facilities (Bore well & Tank)
- Drainage system
- Veterinary Hospital
- Control of Pollution
- Promotion of Cultural Programmes
- Road facility
- Transportation Facility
- Village wise Construction of Community halls and mini libraries
- Vocational Training programme

Biological Environment

Afforestation

An area of 3.53 ha is earmarked for Green belt development and apart from that the disturbed area of 54.27 ha will be taken up for afforestation in a phased manner inside

the applied area. The species going to be planted are Mango, Cashew, Jamun, Kokum, Suru, Phanas, Alma and Subabul etc., as these are having a better chance of survival in this region. Plantations will be done at a spacing of 2 x 2 m. All efforts to improve the survival of the saplings, with their anticipated growth will be taken care by watering, fencing, keeping watch and ward.

Socio-Economic Benefits

The company has allocated a budget for carrying out socio-economic welfare activities as mentioned in the above paragraphs. The amount earmarked in the budget will be separately kept and will not be used for any other purposes. The budget may be increased as per the actual requirement during the implementation stage. The proposed budget for conducting socio-economic welfare measures is given in Table 7.1.as follows:

Proposed Budget for Socio-Economic Welfare Activities (Rs. in Lakh)

Sr. No.	Particulars	Capital Cost	Recurring Expense/Annum
1	Health & Medical facilities	6.00	3.00
2	Education facilities	4.00	2.00
3	Training programmes	3.00	1.50
4	Drinking and Irrigation Water facilities	3.00	2.00
5	Infrastructure development	5.00	2.50
6	Drainage and Sanitation Facilities	2.00	1.50
	Total	**23.00**	**12.50**

Occupational Health and Safety

Occupational safety of the workers in mining area will be achieved by the following:

- Providing a working environment that is conducive to safety & health
- The management of occupational safety & health is the prime responsibility of mine management from the executive level to the first line supervisory level
- Employee involvement and commitment in the implementation of health and safety guidelines
- Periodical health checkups
- Provision of all necessary resources
- Implementing safety and health management system and assessing the effectiveness through periodic audits
- Setting of safety and health objectives based on comprehensive strategic plans and measure and assessing performance against these plans
- Monitoring the effects of mining activities on safety and health and conducting regular performance reviews
- Provision of necessary personal protective equipment's
- Establishing and maintaining a system of medical surveillance for employees
- Ensuring employees at all levels receive appropriate training and are competent to carry out their duties and responsibilities

Budget for Environmental Protection

A budgetary provision has been made for implementation of all the environmental protection measures in a time bound manner. A provision of Rs 43.75 Lakh as capital expenditure and Rs. 27.20 Lakh as recurring expenses per annum for implementation of the Environmental Management Plan has been made.

Particulars	Capital Cost (Rs.)	Recurring Cost (Rs.)
Pollution Control	24.00	7.20
Environmental Monitoring	0	9.00
Occupational Health	9.75	3.00
Reclamation & Rehabilitation	3.00	3.00
Others	7.00	5.00
Total	**43.75**	**27.20**

The presented budget is tentative and may change as per the need

CONCLUSION

The proposed mining activities will lead to the sustainable development of the nearby areas. There will be development of educational, medical and infrastructural facilities in the area. The mining and allied activities will provide direct and secondary employment opportunities for local people. This will lead to the improvement of economic status of the nearby villages. The mining will also benefit the state by way of excise duty and revenue on mineral.

During the active mining period, the pollution will be controlled within permissible limits by way of adopting various control and mitigation measures. Thus, the mining activities will be congenial with the environment and economy of the area.