CHAPTER-5

BLASTING

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CHAPTER - 5.

BLASTING.

Describe briefly:

As per the approved mining plan, blasting parameters are summarized below:

(a). Broad blasting parameters like charge per hole, blasting pattern, charge per delay, maximum number of holes blasted in a round, manner and sequence of firing, etc.

Blasting parameters are described in approved mining plan.

(b). Type of explosives used / to be used

Class III (special gelatin 80 % strength) and class IV explosive detonators and safety fuse of standard length will be used in the mine.

(c) Powder factor in ore and overburden /waste / development heading / slope

Powder factor in ore 2.5 cu m to 3.5 cum (about 7-8 tonnes)/ kg.

(d). Whether secondary blasting is needed. If so describe it briefly

For breaking the big boulders, secondary blasting will be required for which drilling with jack hammers will be done.

(e) Storage of explosive (like capacity and type of explosives (like capacity and type of explosive magazine)

For safe and secure storage of explosives, a permanent magazine is proposed to be installed within the lease hold (as per approved mining plan for 25 hectares of granted M L in Metabodeli adjoining lease of the lessee).

The magazine of M L area of 25 hectares already approved will be utilized for the proposed lease area.

CHAPTER-6

MINE DRAINAGE

CHAPTER-6.

MINE DRAINAGE:

(a). Likely depth of water table based on observation from nearby wells and water bodies.

The depth of the water table is below 20m from the ground level.

The depth of the ground water table is ascertained by nearby wells in the inhabitated areas. The ground level contour is 400 m MSL.

(b). Working expected to be ----------m above /reach below water table by the year----------.

Since the ground contour level is 400 m MSL and there is no water at this level hence, it is expected that the groundwater table will be below this level. During the mining, the mining will be confined to the hill top only and there is no possibility of encountering groundwater.

The working will start from 550m MSL and will go down in the slope upto 515m MSL i.e. about 115m above the ground level. In future slope area, the working will start from 515m MSL and will go down upto the level which will be known after the proposed exploratory BHs are completed.

Topographically, the working area is on hill slope, and the 4 first order streams starts from the hill slope and flowing towards the south-east direction to join the Chargaon nadi. During the rainy season and mining operations, run of mine water is carrying solid waste material from the excavated faces, which will drained outside of the lease area. In order to control this run off, 4 to 5 parapet walls will be constructed along the valley portions to arrest the silt and solid particles before commencement of mining operation.

On the slopes, the contour trenching and bunding will be constructed along the lease area on the down slopes to prevent the siltation and erosion.

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(c). **Quantity the quality of water likely to be encountered, the pumping arrangements and places where the mine water is finally proposed to be discharged.**

This will not be required, since there will be no accumulation of water in the quarry because of slice mining method and on the hill slope only and much above the groundwater table which will be below the ground level i.e 400m MSL hence, there will be no contamination in groundwater.

One seasonal nala in south eastern side of this area is flowing almost N-S and merging in the Chargoan Nadi.

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CHAPTER-7

STACKING OF MINERAL REJECTS AND DISPOSAL OF WASTE

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CHAPTER-7

STACKING OF MINERAL REJECTS AND DISPOSAL OF WASTE :

(a). Indicate briefly the nature and quantity of top soil, overburden /waste and mineral rejects likely to be generated during the next five years.

The rejects generated during in-situ ore mining will be lateritised soil with intercalations like clayey material and rejects formed out of BHQ material in float ore zone and highly laterised low grade ore which cannot be considered for blending and will form about 65% of ROM of float ore, remaining 35% of ROM will be saleable ore.

From in-situ mining, the waste/rejects in the form of some intercalated material to be generated are likely to comprise about 10% of total excavation (i.e. ROM).

The generation of waste /rejects material will be as under:

(i) For Float ore - 35% Saleable ore
65% waste

100% of ROM

(ii) For In-situ ore - 90% Saleable ore
10% intercalated waste material/reject

100% of ROM

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The year-wise generation of rejects/ waste are as under:

Year	Location	Top soil/OB	waste/Rejects 10% of ROM (cu m)
I	Float ore mining	Nil	57,200 (waste 65%)
II	Insitu ore mining	Nil	3,850
III		Nil	4,360
IV		Nil	8,400
V		Nil	8,500
Total		**Nil**	**82,310**

(b). Land chosen for disposal of waste with proposed Justification.

The waste material/rejects generated during the mining plan period will be dumped on the fully mined out float ore zone. A retaining wall will be constructed for the stabilization of the dump in future when dumping area gets increased in width.

The stacking of rejects/ waste will be as under:

Year	waste/Rejects 10% of ROM (cu m)	Height of the dump (m)	Area required for dumping (sq m)	Area considered fro dumping (include 20% as swell factor) (sq m)	Remarks
I	57,200 (waste 65%)	3	19,066	22,879	Dumped on the fully mined out float ore zone as back-filling.
II	3,850	1.5	2,567	3,080	Dumped on the fully mined out float ore zone as back-filling.
III	4,360	1.5	2,907	3,488	
IV	8,400	1.5	5,600	6,720	
V	8,500	1.5	5,667	6,800	
Total	**82,310**			**42,967 or 43,000 sq m**	

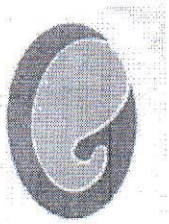
The first year dumping area is almost center of the mined out float ore zone, the height of the first year dump will be kept at about 3 m. The dumping of second to fifth year will be covered the first year dump at about 1.5 m height.

(c). Attach a note indicating the manner of disposal and configuration, sequence of buildup of dumps along with the proposals for the stacking of sub-grade ore, to be indicated year wise.

As indicated above the waste/reject material will be utilized for dumping on the fully mined out float ore zone. The first year dumping area is almost center of the mined out float ore zone, the height of the first year dump will be kept at about 3 m. The dumping of second to fifth year will be covered the first year dump at about 1.5 m height.

Thus, the dump spillage can be protected. A retaining wall will be constructed for the stabilization of the dump in future when dumping area gets increased in width.

CHAPTER-8



USE OF MINERALS

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CHAPTER-8.

USE OF MINERAL:

(a). Describe briefly the end use of the mineral (sale to intermediate parties, captive consumption, exports industrial use).

The iron ore of this mine is for consumption to steel plant at Siltara, Raipur Distt in their BF and Sintering Plant.

(b). Indicate physical and chemical specification stipulated by buyers.

The specification of iron ore for the consumption of lessee's blast furnace & sintering iron at Siltara is as under

Fe%	-------	+63% for BF and 61-62% of sintering Plant
SiO_2%	-------	2.1 to 2.3%
Al_2O_3%	-------	2.3 to 2.5
Al_2O_3% : SiO_2%	-------	Less than 1.2
Moisture	-------	5.0% (Maximum)
Size	-------	Lumps 30mm to 10 mm (for BF)
		Fines -10 mm (for Sinter plant)

Note:- The necessary crushing of loadable size will be done in the steel plant and the products will be accordingly utilized.

(c). Give details in case blending of different grades of ore is being practiced or is to be practiced at the mine to meet specifications stipulated by buyers.

Blending process will not be done in the mine all the iron ore will be transported to the Plant.

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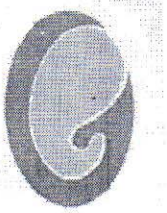
CHAPTER-9



OTHERS

CHAPTER-9.

OTHER:

Describer briefly the following:

(a) Site services:

(b) Employment potential: Highly skilled, skilled, semiskilled, unskilled.

(a) Site services: The common facilities such as, rest shelter, first-aid station, urinal and a blasting shade are proposed to be constructed at the quarry site.

Other site services as Mine office, explosive magazine, approach road Garage, workshop, health centers etc. are already available in 25 Ha lease area and the same will be utilized for this mine also.

(b) Employment potential:

(i) Management and Supervisory Personnel

S.No.	Management and Supervisory Personnel	Qualification	Nos. required
1.	Mine manager	having Managers certificate of Competency	1
2.	Mining Engineers	B.E. Mining	1
3.	Geologist	M.Sc./ M. Tech Geology	1
4.	Mining foreman	Mining foremen certificate of Competency	2
5.	Mining Mate	Mining Mate's certificate of Competency & first aid certificate	4
6.	Safety Engineer	Qualified	1
	Total		**10**

(ii). Labours (skilled/semiskilled/unskilled)

Average daily production of ROM would be 833 tonnes, assuming OMS at 1.8 tonnes, around 150 labours will be required fro the mine.

Highly skilled/skilled		**Semi – skilled**		**Unskilled**	
Categories	**Nos.**	**Categories**	**Nos.**	**Categories**	**Nos.**
Driller for wagon drill	2	Drilling Asstt.	6	Miners/ labours for recovery in first year. Thereafter at working face breaking, sizing to handlable size and loading	150
Driller for J.H.	2				
Compressor Operator	2	Tipper/dozer/ compressor /shovel/ helpers	45		
Shovel operator (2 cum)	2				
Shovel operator (1.2 cum)	1				
Driver for 20 tonner dumper	50				
Driver for 10 tonner tipper	2				
Mechanic	2	Ore-sorting	10		
Blaster	2	Blasting helper	2		
Dozer operator	1				
Total	**66**		**63**		**150**

Note:- The qualified blasters of Metabodeli mine 25 Ha can carry out for blasting for this mine.

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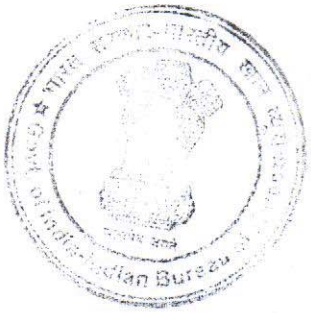
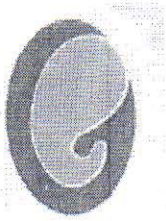
CHAPTER-10





MINERAL PROCESSING

CHAPTER-10

Mineral processing :

(a). If processing / beneficiation of the ore or minerals mined is planned to be conducted on site or adjacent to the extraction area, briefly describe the nature of the processing / beneficiation. This should indicate size and grade of feed material and concentrate (finished marketable product), recovery rate.

Mineral processing is not required, the loadable sized ore will be transported to Steel Plant at Siltara, district- Raipur for further processing (crushing/ screening) for consumption in furnace and sintering plant.

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CHAPTER-11

ENVIRONMENT MANAGEMENT PLAN

Part B

CHAPTER-11

ENVIRONMENTAL MANAGEMENT PLAN:

(a). Attach a note on the status of baseline information with regard to the following:

The baseline information for Environmental management plan are described in approved mining plan as wll as in the EIA/EMP report submitted to the MoEF committee.

Existing Land use Pattern

(i)	Already degrade land due to quarrying / pitting, dumping, road Processing plant, work shop, township etc.	The area of 50 hectares applied under ML is a south-east continuation of the ML area already granted for 25 hectares. This applied area forms the slope of the ore-bearing hilly area of 25 hectares existing M.L. of the Lessee. This area 50 hectares is a virgin area and falls under protected forest land.

Present Land-use pattern	Area in sq. m.
Area under Mining Lease	5,00,000 sqm
Area under Forest	5,00,000 sqm
Area under pits	NIL
Area under dumps	NIL
Area under crusher	NIL
Area under roads	NIL
Area under office and sheds	NIL
Area under plantation	NIL
Area under magazine	NIL

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The base line information and environment impact assessment of ambient air quality, climatic condition, noise level, water quality, soil quality and biological environment have been enclosed as Annexure No. IX.

(b). Attach an environmental Impact Assessment Statement describing the impact of mining and beneficiation on environment on the following over the next five years (and upto conceptual plan period for 'A' category mines).

The base line information and environment impact assessment of ambient air quality, climatic condition, noise level, water quality, soil quality and biological environment have been enclosed as Annexure No. IX.

(c). Attach an Environmental Management plan (supported by appropriate plans and sections) defining the time bound action proposed to be taken with sequence & timing in the following areas (or diagrams should be used).

Temporary storage and utilization of topsoil :- Due to hilly area with outcrops of ore on the slopes, the boulders being embedded in the lateritic matrix, no significant topsoil is available in the area expect at one place majority of which is laterised. However, when uncontaminated topsoil wherever encountered the same will be meticulously removed and transported to the defined place for future plantation.

Year wise proposal for reclamation of land affected by abandoned quarries and other mining activities during 5 years (and upto conceptual plan period for 'A' category mines) clarifying the extent of back filling and re-contouring and /or alternatives use of unfilled / partially filled excavation /road side slopes and mine.

In case abandoned quarries/ pits are proposed to be used as reservoir, their size water holding capacity and proposed for utilization of such water be given.

The mining will be by slicing the slope and removing all the ore available in that bench and similarly continue in subsequent lower benches, hence question of formation of pit does not arise. The ore reserves will lost long even after the ML period expires, the same will be renewed for further period, hence question of back filling /reclamation does not arise at this stage.

The float ore zone will be filled-back by dumping waste/reject material. Almost the float ore area will be covered by dump.

a retaining wall will be constructed all around the dump after necessary preparatory work along with plantation all around the area.

Programme of afforestation, year-wise for the initial five years (and upto conceptual plant period for 'A' category mines) indicating the number of plants with name of species to be afforestated under different areas in hectares.

Stabilisation and vegetation dumps along with waste dump management year wise for the first five years (and upto conceptual plan period for 'A' category mines).

The plateau slope after fully mining the ore will be taken up for plantation at a spacing of 3 m x 3m in the entire area.

Plantation will be carried out on stabilized dump using local grass and tree species.

In this five year mining plan period 50 trees has been proposed for plantation in each year.

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Year/Activity	Plantation	Area sq m
I	50 Nos.	450
II	50 Nos.	450
III	50 Nos.	450
IV	50 Nos.	450
V	50 Nos.	450
	250 Nos.	2,250

At the end of the life of the mine starting from 550 m RL with a thickness of ore body of 7 m depth upto 430 m RL, the excavated insitu ore area will be in the form of the sloping plateau and it will be utilized for plantation of different types of trees which can survive in this region.

Plantation will be carried out on dumps after spreading and levelling.

The proposed plantation during conceptual plan period will be about 900 plants in each hectare area (the spacing of plantation will be 3 m x 3m).

The target area is mostly covered with laterite and lateritic soil (infertile). The topsoil is very limited in quantity and waste material consist of lateritic soil, intercalated clays and rejected material after winning the ore. The quantity of such waste/rejects will be 10% for Insitu ore mining and 65% for float ore mining.

The year wise generation has been described in detail under chapter 7.0. For this dumping, fully mined out float ore zone will be utilized, wherein a retaining wall will be constructed all around the dump after necessary preparatory work along with plantation all around the area.

The average height of dump is proposed to be maintain at 3m from surface level, with a dump slope of around 37 degree (angle of repose) for stabilization.

Measures to control erosion /sedimentation of water courses, treatment and disposal of water from mine, measures for mining adverse effects on water regime.

As the mining of the ore deposit would mostly be confined to hill slope, surface run-off water accumulated in the quarry is expected to be remote. The ground water-table lies below the ground surface level. This is ascertained by the nearly wells in the inhabitated area. Hence, there will be no adverse effect on ground water regime. Since there will be no treatment plant for beneficiation of ore, disposal of water from mine will be nil. Plantation of grass type species along the dump slopes will be done for further control of erosion in future after levelling the dump.

Protective measures for ground vibration / air blast caused by blasting.

Provision of delay detonators for blasting and proposed plantation in non-mining zone will help to keep the noise level within 90 dB and also help in reducing vibration level.

Measures for protecting historical monuments and for rehabilitation of human settlement likely to be disturbed due to mining activity.

This does not apply, since there is no monument in the area, which is a reserve forest.

Socio-economics benefits arising out of mining.

Mining activities will generate suitable employment of local village people, thereby increasing their socio-economic conditions. They may also be imparted need base technical education to get suitable employment under skilled category also.

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(d). Monitoring schedules for different environmental components after the commencement of mining and other related activities.(for 'A' category mines only)

Note: Ground vibration studies are to be carried out for virgin area/ new leases after one year from the commencement of mining activities. (for 'A' category mines only)

Note: While preparing mining plans various circulars issued by CCOM particularly the Circular no. 2/91 regarding conceptual plan, 5/91 regarding requirement of exploration and existence of mineral, 3/92 regarding generation of baseline data by mechanized mines etc. may also be referred and taken into account.

The monitoring schedule for environmental parameters as under (on the basis of the EIA/EMP report):

Sr. No.	Particulars				
1	**Air Pollution & Meteorology**				
	Air Quality				
	A.	Ambient air quality monitoring			
		1. Metabodeli village 2. Proposed mine premises	Twice in a week for one month	24 hours continuous	Suspended particulate matter, RSPM, SO_2, NOx
		Dust fall measurement at villages Metabodeli and Nawagel, Karma and at the exit gate of the mine	Monthly	Continuous monitoring	Dust fall measurement
2	**Water and waste quality**				
	A	Industrial / Domestic			
	1	Mine effluents (if any) during monsoon	Once in a year	24 hour composite	As per the EPA guidelines, 1986
		Domestic raw & treated	Yearly	24 hour composite	As per the EPA guidelines, 1986
		Ground water: 1) Dugwell in Metabodeli village	Once in a year	Grab	As per the parameters specified under IS:10500

3	**Industrial Noise level**			
	Along the haul road for transportation noise	Monthly	24 hours continuously wit h3 hr interval	Noise levels in dB (A)
4	Ground water monitoring	Annually	In 5 km radius covering atleast 5 dugwells	Static water level, pumped water level, seasonal fluctuation etc.

The environment monitoring will be carried out as per the guidelines of MoEF.

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CHAPTER-12

PROGRESSIVE MINE CLOSURE PLAN

PART - II

CHAPTER-12

PROGRESSIVE MINE CLOSURE PLAN

12.1 INTRODUCTION:

The name of lessee, the location & extent of lease area, the type of lease area (forest, non-forest etc), the present land use pattern, the method of mining and mineral processing operations should be given.

(a). Name of lessee:

Name of Lessee:	**M/S JAYASWAL NECO INDUSTRIES LIMITED.** formerly known as JAYASWALS NECO LIMITED and **NACAST** (Nagpur Alloys Casting LTD) Jayaswals NECO LTD. Address: F/8 MIDC Industrial Area Hingna Road, Nagpur Correspondence address: Siltara Growth Centre, Siltara, Raipur(Chhattisgarh) Phone – 07721- 264238 to 41 Fax- 07721 264-270.
Status of Lessee....	Public Limited Company

(b). The location & extent of the lease area:

The type of lease (forest/Non-forest, etc.) The lease area comprising of 50 hectares comes under forest land.

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The details of the land covered in the lease is as under (as per Approved Mining plan):

District/ State	Tehsil	Village	Forest Range/ Block/ Circle	Compartment No./Area	Area in Hec.	Owner-ship
Kanker/ Chhatti-sgarh	Pakhanjur	Metabo-deli	Metabodeli P.F. in Antagarh Range under Bhanupratappur Forest Division Kanker Circle	426(P)/1305	45.00	Govt. Forest Land (Protected Forest)
				427(P)/1306	05.00	

(c). <u>Present land-use pattern</u>: - The applied area is almost rectangular in shape and is in juxtaposition of already approved M.L. of 25.0 hect. in the name Metabodeli village. This applied area is dip side SE-extension of the hilly area under 25.0 hect. and forms hill slopes. The highest altitude id 550m, and the lowest is 390m MSL.

Land-use pattern	Area in sq. m.
Area under Mining Lease	5,00,000 sqm
Area under Forest	5,00,000 sqm
Area under pits	NIL
Area under dumps	NIL
Area under crusher	NIL
Area under roads	NIL
Area under office and sheds	NIL
Area under plantation	NIL
Area under magazine	NIL

(d). <u>The method of mining</u>: The mine will be open cast manual mine, aided by mining machineries required for drilling, dozing, loading and transportation of ore by trucks / tippers, fully Mechanized method. This has been described in detail in Chapter-4 of modification in approved Mining plan.

(e). Mineral Processing Operations : Since the ore meets the quality specification required by the blast-furnace and sintering plant by crushing and screening, further mineral processing operation is not required.

12.1.1. REASONS FOR CLOSURE: -

The reason for closure of mining operations in relation to exhaustion of minerals, lack of demand, uneconomic operations, natural calamity, directives from statutory organizations or court etc should be specified.

Since this will be a captive mine for supplying iron ore to the steel plant, its closure does not apply. This PMCP is a continues series of activities and an integral part of Mining plan.

12.1.2. STATUTORY OBLIGATION: The legal operations, if any which the lessee is bound to implement like special conditions imposed while execution of lease deed, approval of Mining Plan, directives issued by the Indian Bureau of Mines, conditions imposed by the Ministry of Environment & Forest Govt. of India, State or Central Pollution control Board or by any other organisation describing the nature of conditions and compliance position thereof should be indicated here (the copies of relevant documents may be attached as Annexure).

While executing the lease deed, the lessee undertakes all responsibilities in respect of legal obligations, directives issued by IBM, and M/N of Environment and Forest, State or Central Pollution Control Board or by any other organization for compliance.

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12.1.3 CLOSURE PLAN PREPARATION: - The names and address of the applicant and recognized qualified person who prepared the Mine Closure Plan and the names of existing agency if any should be furnished. A copy of the resolution of the Board of Directors or any other appropriate administrative authority as the case may be on the decision of the closure of mine should be submitted.

The name and address of the Lessee-	**M/S JAYASWAL NECO INDUSTRIES LIMITED.,** F/8 MIDC Industrial Area Hingna Road, Nagpur. Siltara Growth Centre, Siltara, Raipur (Chhattisgarh) Phone – 07721- 264238 to 41 Fax- 07721 264-270.
The name and address of the RQP-	Shri Shalabh Saha, HIG 21- Hudco, Bhilai, Distt. Durg -490009. RQP/NGP/302/2003/A

12.2 MINE DESCRIPTION:

12.2.1 GEOLOGY:- Briefly describe the topography and general geology indicating rock-types available, the chemical constituents of the rock/mineral including toxic element, if any, at the mine site

The area applied under lease represents the slope of the hills (already under M.L. of 25 hect of Lessee) tending NE-SW with no prominent structural valleys. This applied area is dip-side extension of existing ML of 25 ha. The local geology of the area consist of very thin cap of laterite mixed alluvial soil at places, Canga and Float ore, BHQ and massive / laminated ore in continuation of exiting ML of 25.0 Hect. along the hill slope in form of exposure as outcrops. The ore -bearing mineral is mainly hematite analyzing +65% Fe. There is no toxic element present.

The detail of geology has been given in the Approved Mining Plan Chapter 3.

12.2.2. RESERVES: Indicate the mineral reserves available category-wise in the lease area estimated in the last Mining plan/Scheme of mining approved along with balance reserves at the proposed mine closure including its quality available.(for final mining closure plan only).

This has been given in detail in the Approved Mining Plan Chapter 3 (e).

12.2.3. MINING METHOD: -Describe in brief the mining method followed to win the mineral, extent of mechanization , mining machinery deployed , production level etc.

The mining work will be open cast manual mining method by using required mining machineries by manual method.

This has been described in detail in chapter in chapter 4 of Approved Mining Plan.

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12. 2.4. MINERAL BENEFICIATION:- Describe in brief the mineral beneficiation practice if any indicating the process description in short. Indicate discharge details of any middlings/tailings and their disposal / utilization practice followed.

Since the loadable sized ore (ROM) meets the specification of blast furnace/sinter plant of the lessee, no further beneficiation is required.

12.3. REVIEW IMPLEMENTATION OF MINING PLAN/ SCHEME OF MINING INCLUDING FIVE YEAR PROGRESSIVE CLOSURE PLAN UPTO FINAL CLOSURE PLAN OF MINE:-

Indicate in detail the various proposals committed to be implemented with special emphasis on the proposals for protection of environment in the approved Mining Plan/Scheme of Mining including five years Progressive Closure Plan up to the Closure of mine vis-a vis their status of implementation. Highlight the areas, which might have been contaminated by mining activities and type of contaminants that might be found there. The reason for deviation from the proposal, if any, with corrective measures taken should also be given

Following proposals are made for the proposed modification in approved mining plan for protection of the environment:

Proposal for reclamation of land affected by mining activities- Since the mining of in-situ ore from the top of the hill will be done by slicing method, there will be no pit formation in the area but after the entire ore will be mined out it will be a flat topography. Hence, no reclamation is required. After the entire ore removed, the area will be taken for plantation.

However, the float ore area will be filled back after fully exhaustion of float ore.

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Plantation Programme- For plantation of infertile soil, such plants will be selected so that they can survive under preventing conditions.

It is proposed to have plantation at the rate of 50 samplings per year required to be planted at a spacing of 3 meters apart.

The plantation during the mining plan period has been proposed in eastern boundary in 7.5 m of mining limit zone.

Proposed Plantation in this mining plan period in 7.5 m non-mining zone will be as under:

Year/Activity	Plantation	Area sq m
I	50 Nos.	450
II	50 Nos.	450
III	50 Nos.	450
IV	50 Nos.	450
V	50 Nos.	450
	250 Nos.	2,250

Waste Management – During the float ore mining, after the float ore is fully removed, the waste material (65% of ROM) will be dumped on the outside of this fully mined out area.

From the second year onwards, the waste/reject material (10% of ROM) will be dumped on the fully mined out float ore area. This has been fully explained in the modification in approved Mining plan.

Wherever topsoil is encountered the same will be removed separately and transported to 7.5 m non-mining zone for plantation.

In order to stabilize the dump, it is proposed to plant herbaceous trees on the dump terraces initially. Once the dump is stabilized other species of shrubs /trees will be planted to improve the aesthetic beauty of the area. A retaining wall is proposed to be constructed around the dump area to prevent the dump in future.

12.4. CLOSURE PLAN:

12.4.1. MINED-OUT LAND: Describe the Proposals to be implemented for reclamation and rehabilitation of mined out land including the manner in which the actual site of the pit will be restored for future use. The proposal should be supported with relevant plans & section depicting the method of land restoration /reclamation/rehabilitation.

Reclamation of mined out area is the most useful activity of EMP. As a result of mining, the original ground profile will get changed. The applied area is having topography of hilly slope and highest contour is about 550 m MSL, which is about 150.0 m from the ground level. The hill slope containing iron ore will be mined out by slicing method thereby reducing the elevation. After the entire iron ore is mined out, the land will be taken up for afforestation. Proposed Plantation in this mining plan period in 7.5 m non-mining zone will be as under:

Year/Activity	Plantation	Area sq m
I	50 Nos.	450
II	50 Nos.	450
III	50 Nos.	450
IV	50 Nos.	450
V	50 Nos.	450
	250 Nos.	2,250

Reclamation of pit:

The insitu ore mining will be done by slicing method, hence, there will be no formation of pit and the working will continue till the entire ore is economically mined out as such, the reclamation of mining pit for insitu ore body does not arise.

During the float ore mining after its full extraction, the excavated area will be filled back simultaneously by the dumping of waste material. The area coming under float ore mining will be about 44,000 sqm in this mining plan period.

12.4.2. WATER QUALITY MANAGEMENT: Describe in detail the existing surface and ground water bodies available in the lease area and the measures to be taken for protection of the same including control of erosion, sedimentation, siltation, water-treatment, diversion of watercourses, If any, measures for protection of contamination of ground water from leaching etc. Quantity and quality of surface water bodies should also be indicated and corrective measures proposed to meet the water quality, conforming the permissible limits should also be described. Report of the hydrogeological study carried out in the area may also be submitted. The water balance chart should be given .If there is potential of Acid Mine Drainage the treatment method should be given.

Topographically, the working area is on hill slope, and the 4 first order streams starts from the hill slope and flowing towards the south-east direction to join the Chargaon nadi. During the rainy season and mining operations, run of mine water is carrying solid waste material from the excavated faces, which will drained outside of the lease area. The 4 to 5 parapet wall and the check dams will be constructed along the slope of the each drainage to arresting the silt and solid particles before commencement of mining operation.

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On the slopes, the contour trenching and bunding will be constructed along the lease area on the down slopes to prevent the siltation and erosion.

12.4.3. <u>AIR QUALITY MANAGEMENT:</u> Describe the existing air-quality status .The corrective measures to be taken for prevention of pollution of air should be described.

The present air quality is free from any pollution, when the mining operation will commence some amount of dust due to movement of trucks / tipper, blasting of ore body, loading & unloading of ore will be generated. This can be lessened by sprinkling water wherever necessary such as haulage roads, dumping yards etc. Delay detonators will be used to keep the air / noise level within permissible limit of 500 SPM.

12.4.4. <u>WASTE MANAGEMENT:-</u>

Describe the type, quality and quantity of overburden, mineral rejects etc available and their disposal practice. If no utilization of waste material is proposed the manner in which the waste material will be stabilized should be described. The protective measures to be taken for preventation of siltation erosion and dust generation from this waste material should also be described If toxic and hazardous elements present in the waste material the protective measures to be taken for prevention of their disposal in the air environment, leaching in the surface and ground water etc. should be described.

The waste/reject to be generated in the mine can be obtained in two sources i.e. waste from float zone, and insitu massive / laminated ore zone. The waste to be generated has been assumed to comprise about 10% of total excavation

of insitu ore and 65% of float ore ROM. The waste/reject to be generated during mining will be mostly lateritic soil.

The waste generated from float ore mining in the first year will be backfilled/ dumped on almost the center of fully mined out float ore zone. From second year on wards waste/reject material is generated in mining insitu ore will be dumped on the fully mined out float ore zone covering the first year waste dump. The detail of generation of waste/reject material during 5 years is given in the approved mining plan chapter 7.

12.4.5. TOP SOIL MANAGEMENT: -

The top soil available at the site and its utilization should be described.

In this lease area, the top soil available on the hill slopes is infertile laterite and occurring as very thin capping at places.

Wherever, uncontaminated alluvial soil is encountered, the same will be excavated, transported to 7.5 m non-mining zone and utilized for plantation.

12.4.6. TAILING DAM MANAGEMENT:-

The steps to be taken for protection and stability of tailing dam, stabilisation of tailing material and its utilization, periodic desilting, measures to prevent water pollution from tailings etc, arrangement for surplus water over flows along with details design structural stability studies, the embankment seepage loss into the receiving environment and ground water contaminant, if any, should be described.

Since there will be no beneficiation plant, the question of tailing dam management does not arise.

12.4.7. INFRASTRUCTURES: –

The existing infrastructure facilities available such as roads, aerial ropeways, conveyor belts, railways, power lines, buildings & structure, water treatment plant, transport, water supply source in the area etc. and their future utilisation should be evaluated on case to case basis. If retained the measures to be taken for their physical stability and maintenance should be described. If decommissioning proposed, dismantling and disposal of building structures, transmission line, water line, gas pipe line, water works transportation, infrastructure like roads, rails, tanks, bridges, culverts, electrical equipment and infrastructure like electrical cables, transformers to be described in connection with resorting land for future use.

The M.L area in a reserve forest area and at present there is no infrastructure facilities of any kind in this area.

12.4.8. DISPOSAL OF MINING MACHINERY: –

The decommissioning of mining machineries and their possible post mining utilisation, if any, to be described.

The life of the proposed mine will be 13 years with the proposed annual production of 2.97 lakh tonnes. Hence, question of disposal of mining machinery at the initial ML period does not arise.

12.4.9. SAFETY & SECURITY :–

Explain the safety measures implemented to prevent access to surface openings, excavation etc.and arrangement proposed during the mine abandonment plan and up to the site being opened for general public should be described.

The area applied for ML is a hill slope in the forest area in continuation of existing ML of 25 Hect; and not connected by public transport road being in remote forest, hence access to mine opening does not arise. Further, there will be no pit formation as mining will be done in slice-mining method from the top slope of the hill to ore-bearing bottom slope. Mining operation will be carried out for about 300 days / year and hence question of its temporary closure does not arise. Three security guards round the clock will be posted to prevent access to the mine opening for safety and security during the abandonment of the mine.

12.4.10. DISASTER MANAGEMENT AND RISK ASSESSMENT: –

This should deal with action plan for high risk accidents like land slides, subsidence flood, inundation in underground mines, fire, seismic activities, tailing dam failure etc and emergency plan proposed for quick evacuation ameliorative measures to be taken etc. the capacity of lessee to meet such eventualities and the assistance to be required from the local authority should also be described.

The mining will be by open-cast method aided by required machineries for drilling, loading and transporting on the hill slope having competent rock; hence the reasons given above will not take place. Therefore, no emergency plan is called for.

No disaster is envisaged as no permanent construction prone to disaster has been erected. No severe earthquake resulting to loss of life and property has occurred in past. The lease area falls under safe seismic zone.

The ultimate pit slopes of benches will be maintained about 45^0 from the horizontal. No loose stone or debris shall be allowed to remain within a distance of 3 m from the edge or side of the excavation.

The mechanical failure and human error may lead to accident due to mining machinery and transportation such as dumpers and loader cum excavator. All the mining machineries will be regularly maintained and hacked such as brakes, lights and horns to keep in the efficient working order.

Sufficient numbers of fire extinguishers will be installed at selected locations on surface like fuel stations, workshop / garage and stores etc.

However, following measures will be adopted during mining.

(i) All safety precautions and provisions of Mines Act-52, MMR 1961 and Mines Rules-55 will be strictly followed in all mining operations.

(ii) Avoidance of danger as per Regulation 117 and general precautions and safety as per Regulation 118 and 181 of MMR 1961 will be observed.

(iii) Mining operations will be done under supervision of qualified and statutory personnel as per MMR 1961 and MCDR 1988.

(iv) Mine working will be done as per approved Mining Plan following provisions of MCDR 1988 and Regulation 106, 110, 111 & 115 of MMR 1961.

(v) General and surface precautions against fire i.e precautions and provision of firefighting equipment will be taken as per Regulation 119 of MMR 1961.

(vi) Entry of unauthorized persons will be prohibited.

(vii) Provisions of all the safety applications and protective wears such as safety boot, helmets, goggles, hand gloves, ear muffs, etc. as per Regulation 182 will be made available to the employees and regular checked for their use.

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(i) Cleaning of mine faces will be regularly done.

(ii) Handling of explosive, charging and blasting will be carried out by competent persons only as per MMR.

(iii) Provision of magazine at a safe place with fencing and necessary security arrangement.

(iv) Adequate safety equipment provided at explosive magazine.

(v) Regular maintenance and testing of all mining equipments as per manufacturer's guidelines.

(vi) Increasing the awareness of safety and disaster through proper training of mining staff.

(vii) The haul roads will be kept sufficiently wide to ensure free and safe movement with proper alignment and gradient.

(viii) Medical appliances / specified First Aid box as per Section 21 of Mines Act 1952 will be maintained in the mine office. The Mine Manager and other qualified persons will render first aid to injure if needed.

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12.4.11. CARE AND MAINTENANCE DURING TEMPORARY DISCONTINUANCE: -

For every five yearly review (as given in the mining scheme), an emergency plan for the situation of temporary discontinuation or incomplete programme due to court order or due to statutory requirements or any other unforeseen circumstance should include a plan indicating measures of care maintenance and monitoring of status of unplanned discontinued mining operations expected to re-open in near future. This should detail item-wise status, monitoring and maintenance with periodicity and objectives.

An emergency plan for the situation of temporary discontinuance due to reasons given above will be drawn and executed depending upon the situation. Since the mining is not hazardous and total mining strength including (executives, supervisors & workers) will be around 200 nos as given in details in chapter 9, the situation for emergency plan is evinced.

12.5 ECONOMIC REPERCUSSIONS OF CLOSURE OF MINE AND MANPOWER RETRENCHMENTS:

Manpower retrenchment, compensation to be given, socio- economic repercussions and remedial measures consequent to the closure of mines should be described, specifically stating the following.

12.5.1. Number of local residents employed in the mine, status of the continuation, family occupation and scope of joining the occupation back.

The number of local residents employed in the mine with maximum un-skilled labourers with a few semi-skilled workers will be around 200. The local people are engaged in their own traditional and family occupation like agriculture, collection of forest produce and allied jobs. These people will go back to their respective profession/employments after the closure of mine. But since the mining operations will be a continuous work throughout ML period upto the life of the mine, such situation may not arise because their minimum wages will be much higher than the earning from their respective professions.

12.5.2. Compensation given or to be given to employees connecting with sustenance of himself or his family members.

The retrenchments compensation to the workers, as and when required, will be given as per the Central Labour Legislation applicable to Metalliferrous mines.

12.5.3. Satellite occupation connected to the mining industry number of persons engaged these in continuance of such business after mine closes.

As mentioned earlier, the life of the mine will be about 13 years. Hence after the first ML period expires, the same will be renewed further and so on till the ore is exhausted (i.e. upto the life of the mine). After exploration BHs are completed during the Mining Plan period, the overall ore-reserves are likely to enhance, thus increasing future production plan and life of the mine. The reserves will be revised in subsequent mining scheme.

12.5.4. Continued engagement of employees in the rehabilitated status of mining lease area any other remnant activities.

There is no chance of Mining Lease area getting rehabilitated since it is a Govt. Reserved Forest Land, which will revert back to the Forest Dept. after the life of the deposit/ ML period whichever is later.

12.5.5. Envisaged repercussion on the expectation of the society around due to closure of mine

The employment potential of the mine is small; hence it will have no repercussions on the expectation of the society around due to closure of the mine, since the mining lease is in Govt. Reserved Forest.

However, socio-economic condition of surrounding villages will have a positively improvement.

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12.6 TIME SCHEDULING FOR ABANDONMENT:

The details of time schedule of all abandonment operations as proposed as Para 4 i.e. Closer Plan should be described here. The man-power and other resources required for completion of proposed job should be described. The schedule for such operations should also be supplemented by PERT (Program Evaluation and Review Technique), bar chart, etc.

The time scheduling for abandonment operations as proposed is as under:

Retaining wall:

The dumping will be carried out on the fully mined out float ore zone, the length of the retaining wall will be about 580 m.

Plantation:

For plantation of infertile soil, such plants will be selected so that they can survive under preventing conditions.

It is proposed to have plantation at the rate of 50 samplings per year required to be planted at a spacing of 3 meters apart.

Year	Number	Area (sq m)
I	50 Nos.	450
II	50 Nos.	450
III	50 Nos.	450
IV	50 Nos.	450
V	50 Nos.	450
Total	250 Nos.	2,250

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Environment monitoring stations:

The monitoring stations (2nos. for each) for air, noise, water and soil will be established within the applied lease area during the first year of the mining plan period. This has been marked on the Environment Management Plan Plate no. VII.

Stations	Nos.
Ambient Air Quality	04
Water Quality	04
Noise level Survey	04
Soil Quality	04
Ground vibration	02

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12.7.ABANDONMENT COST:

Cost to be estimated based on activities required for implementing the protective and rehabilitation measures including their maintenance and monitoring programme.

The Cost estimated based on activities required for implementing the protective and rehabilitation measures including their maintenance and monitoring programme are as under:

Retaining wall:

Length (m)	Width (m)	Cost (Lakh Rs.)
580	1	2.00
		2.00

Plantation:

Year	Number	Area (sq m)	Cost (Rs.)
I	50	450	5,000
II	50	450	5,000
III	50	450	5,000
IV	50	450	5,000
V	50	450	5,000
Total	**250**	**2,250**	**25,000**

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Environment monitoring stations:

The monitoring stations for air (2 nos.), noise (one), water (one) and soil (one) will be established within the applied lease area during the first year of the mining plan period.

Year	Stations	Nos.	Cost (Rs)
First year	Ambient Air Quality	04	1,00,000.00
	Water Quality	04	20,000.00
	Noise level Survey	04	80,000.00
	Soil Quality	04	24,000.00
	Ground vibration	02	25,000.00
Total			**2,49,000.00**

Safety and Security:

Three security guards will be employed for safety and security in case required. They will be posted at the time of abandonment.

Monthly payment for one guard (Rs)	Yearly payment for one guard (Rs)	Yearly payment for 3 guards (Rs)
Rs. 3,000.00	Rs. 36,000.00	Rs. 1,08,000.00
Total		**Rs. 1,08,000.00**

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ITEMS	DETAILS	AREA (Ha.) PROPOSED					QUANTITY PROPOSED					EXPENDITURE (Rs in thousand) PROPOSED				
	YEAR	1st	2nd	3rd	4th	5th	1st	2nd	3rd	4th	5th	1st	2nd	3rd	4th	5th
RECLAMATION & REHABILITION OF MINED OUT LAND AREA	(i) Backfilling	4.4										nil				
	(ii) Afforestration on the backfilling area															
	(iii) Others (please specify) e.g.															
	(iv) Pisciculture															
	(v) Converting into water reservoir															
	(vi) Picnic Spot															
STABILIZATION & REHABILITION OF DAMS (with lease)	(i) Terracing															
	(ii) Pitching															
	(iii) Construction of Parapet Walls / Retaining wall at toe dump															
	(iv) Construction of Check Dams along slope of vallies etc.															
	(v) Construction of Setting Ponds (Garland drain etc.)															
	(vi) Desilting of setting ponds, channels.															
	(vii) Afforestration on dumps.															
	(viii) Others (please specify)															
REHABILITION OF BARREND AREA WITHIN LEASE	(i) Afforestration (Green belt building)	0.045	0.045	0.045	0.045	0.045	50	50	50	50	50	5	5	5	5	5
	(ii) Retaining wall for Soil dump	--	--	--	--	--	--	--	--	--	--	--	-		--	--
ENVIRONMENTAL MONITORING (Core zone & Buffer zone separately)	(i) Ambient Air Quality station						04					100				
	(ii) Water Quality station						04					20				
	(iii) Noise level Survey station						04					80				
	(iv) Ground Vibration						02					25				
	(v) Soil Quality station						04					24				
	TOTAL	0.045	0.045	0.045	0.045	0.045	66	50	50	50	50	256	5	5	5	5

12.8. FINANCIAL ASSURANCES:

The financial assurance can be submitted in different forms as stated in Rule 23(F) (2) of Mineral Conservation & Development (amendment) Rules, 2003 in the Mine Closure Plan the manners in which financial assurance will be submitted to Regional Controller of Mines, Nagpur region, before the execution of lease.

Table showing the area "put to use" area to be reclaimed and financial Assurance to be paid.

S NO.	Head	Area put On use at the start of Plan (Hect)	Additional Require-ment during plan Period (Hect)	Total (Hect)	Area considered As fully reclaimed & Rehabilitated (Hect)	Net area Considered for Calculation (Hect)
		A	B	C=(A+B)	D	E=(C-D)
1	Area under mining	---	6.8700	6.8700	--	6.8700
2	Storage for Top soil	---	---	---	---	
3	Overburden / dumps	NIL	NIL	NIL	---	NIL
4	Sub-grade storage	---	NIL	NIL	---	NIL
5	Infrastructure (workshop, administrative building etc.)	---	0.0640	0.0640	---	0.0640
6	Roads	Nil	1.4500	1.4500	---	1.4500
7	Railways	---	---	---	---	---
8	Green Belt	---	0.2250	0.2250	---	0.2250
9	Tailing pond	---	---	---	---	---
10	Effluent treatment plant	---	---	---	---	---
11	Mineral separation plant	---	---	---	---	---
12	Township area	---	---	---	---	---
13	Others to specify	---	---	---	--	---
	Grand Total	Nil	8.6090	8.6090	---	8.6090

Amount of Financial Assurance 8.6090 x Rs. 25,000 = ₹ 2,15,225/-

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Shalabh Saha

Geo Solutions (P) Ltd.
Bhilai, Dist- Durg (C.G)

खान नियंत्रक (मध्यांचल)
Controller of Mines (Central Zone)
भारतीय खनि ब्यूरो
Indian Bureau of Mines

SHALABH SAHA
RQP/NGP/302/2003/A

12.9 CERTIFICATE:

The above mentioned actions have been taken to be stated clearly in the mine closure plan. A certificate duly signed by the lessee to the effect that said closure plan complies all statutory rules, regulations, orders made by the Central or State Government, statutory organizations, court etc. have been taken into consideration and wherever any specific permission is required the lessee will approach the concerned authorities. The lessee should also give an undertaking to the effect that all the measures proposed in this closure plan will be implemented in a time bound manner as proposed.

Certificate from the Lessee regarding submission of Mine closure plan is enclosed.

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12.10 PLANS, SECTIONS etc.:

The chapter 1, 2, 3 and 4 should be supported with Plans and Sections. The Closure Plan may also be submitted depicting photographs, satellite images on compact disc etc. wherever possible.

Chapter 1: Plate No.I enclosed (Forest Map, marked applied area).

Chapter2: Plate No.III (Surface Plan), Plate No.IV (Surface Geological Plan) and Plate No.IV A (Geological Cross-sections).

Chapter3: Plate No.V (Year Wise Production & Development Plan) and Plate No.V A (Year wise Production & Development Sections).

Chapter4: Plate No.VIII (Progressive Mine Closure Plan) showing area proposed to be put to use.

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