SCHEME OF MINING

&

PROGRESSIVE MINE CLOSURE PLAN

(2011-2012 to 2015-2016)

FOR

Navalutti Iron Ore Mines,

Of M/s. H.R. GAVIAPPA & COMPANY,

M.L. NO. 2483, EXTENT OF 34.00 HECTARES

(Including 2.00 Ha. of approach road)

As per Mining Lease deed and 32.340 Hectares as per CEC Sketch

SITUATED IN NAVALUTTI VILLAGE, SANDUR TALUK,

BELLARY DISTRICT, KARNATAKA STATE

SUBMITTED UNDER RULE 12(3) & 23B (3) OF MCDR-1988

(Cat. A /Fully Mechanized/Forest)

Prepared by:

Ravi Kumar. S

B.E., (Mining)

RQP/BNG/167/2002/A

&

Dr. C.P. PRASANNA KUMAR,

M.Sc., (Appli. Geo), PhD., FGS.

RQP/BNG/168/2002/A

Name of the Lessee:

M/s. H.R. Gaviappa & Company,

3rd Floor, H.R.G. Complex,

H.R.G. Circle,

BELLARY- 583 101

SCHEME OF MINING
FOR NAVALUTTI IRON ORE MINES,
OF M/S. H.R.GAVIAPPA & COMPANY
M.L.NO.2483, EXTENT OF 34.00 HECTARES (INCLUDING 2.00 HECTARES OF APPROACH ROAD)/32.340 HECTARES AS PER CEC SKETCH SITUATED IN NAVALUTTI VILLAGE, SANDUR TALUK, BELLARY DISTRICT, KARNATAKA STATE

INTRODUCTION:

The Mining Lease "Navaluti Iron Ore Mine" M.L.No.2483 is granted in favor of M/s.H.R.GAVIYAPPA & COMPANY over an extent of 34.00 Hectares (Including 2.00Hectares of approach road) at Navaluti Village, Sandur Taluk, Bellary District, in the State of Karnataka. The lease was first granted in the year 1956 & subsequently regularly renewed and the last renewal executed is on 2nd April 2005 for a period of 14 years and is valid w.e.f. from 24.04.2002 to 17.10.2016. The mining lease deed copy is enclosed as **Annexure-01A.**

The lease area as per the mining lease deed sanctioned is 32 ha for mining and 2.0 ha for approach road. The lease is in Forest land and Forest Clarence has been granted for an area of 34 ha. The forest clearance (FC) copy is enclosed as **Annexure-01E**. The Environmental Clearance from Govt. of India under Environmental Impact Assessment as per S.O. 1533 dated 14.09.2006, is obtained vide MOEF clearance letter No.J-11015/413/2005-IA. II(M) dated 5th June, 2006., the copy is enclosed as **Annexure-01D.** The aforesaid area is found to be mineralized with presence of Iron ore.

As per the details available, the Mining Lease (ML) was first granted in 1956 for 20 years & first renewal of the lease was for 5 years *w.e.f.* 18.10.1976 as ML No 1408. The Second renewal of the lease was for 5 years *w.e.f.* 18.10.1981 & was executed as ML No 1793. Third renewal of the lease was for 10 years *w.e.f* 18.10.1986 and executed with ML No 2054.

Scheme of mining is approved subject to conditions laid down in letter No. 279/(SO)/ 90/BNG Dt. 26/02/2014

Regional Controller of Mines, Indian Bureau of Mines, Bangalore

Dr. C.P. Prasanna Kumar,	**Sri. Ravikumar S.**
M.Sc., (Appli. Geo), Ph.D., FGS.	**B.E., (Mining)**
RQP/BNG/168/2002/A	**RQP/BNG/167/2002/A**

The Fourth renewal of the lease was for 5 years 6 months *w.e.f.* 18.10.1996 was executed as ML No 2247 over an area of 32.00 ha. The Fifth renewal of the lease for 14 years 6 months *w.e.f* 24.04.2002 to 17.10.2016 was executed as ML No 2483 over an extent 34.00 ha, including 2.0 ha of approach road area.

The mine was in operation till 29th July 2011, after which mining activities were suspended due to blanket ban as per the orders of the Hon'ble Supreme Court.

The earlier Scheme of Mining was prepared under Rule 12 of MCDR 1988 and approved vide letter No.MS/BLR/fe-83-SZ dated 16.11.2006, and modified

Scheme of Mining under Rule 10(2) of MCDR 1988 was approved vide letter No. MS/BLR/FE-83-SZ/575 dated 20.04.2010. The copies of the approval letter of Scheme of Mining and Modified Scheme of mining is enclosed as **Annexure-01B.**

The earlier Scheme of Mining was valid from 2006-07 to 2010-11 and further Scheme of Mining had to be submitted for the period 2011-12 to 2015-16. The Draft copies of the Scheme of Mining were submitted to Indian Bureau of Mines on 23rd May 2011 and mining activities were subsequently suspended due to blanket ban order of Hon'ble Supreme Court. Thus the Scheme of mining was not further processed and is now again being submitted for approval after the Honorable Supreme Court Order lifting the ban & as per the maximum production capacity conferred by the Reclamation & Rehabilitation Plan (R & R Plan) prepared by Indian Council of Forest Research & Education (ICFRE) & approved by CEC Constituted by the Supreme Court. The recommendations of the Central Empowered Committee (CEC) after the joint survey on 26th June 2011 have categorized the mine under "B" Category. Based on the findings the lease deed sketch is found to be 32.34 Ha & the details of the survey are given in the Joint survey sketch enclosed as **Plate No. 02C**. The R & R has been prepared & approved for sustainable production capacity of 1.05 lac tones/annum considering the factors like iron ore reserves, dumps capacity, road capacity and the earlier

damages caused to the environment, the engineering & biological measures for management of the degraded areas & overburden dumps/sub grade dumps, drainage system etc., is also incorporated in this Scheme of Mining. Thus the present Scheme of Mining for the balance period of 2011-2016 (for the balance period 2013-14 to 2015-16) is being submitted for maximum saleable production of Iron Ore with a capacity of about 1.05 lakh tonnes/annum for approval as per the CEC Reclamation & Rehabilitation plans recommendations. The copy of Mahazar report and Notice form Department of Mines & Geology R & R recommended production quantity letter copy enclosed **Annexure-01G**.

M/s. H. R. Gaviappa & Company intend to produce Iron ore from the subject lease area for their captive steel plant - **HRG Alloys & Steel Pvt. Ltd.,** an Integrated Steel plant of 300TPD capacity and also for other local domestic Steel & Sponge Iron Plants. The requirement of iron ore per annum for the captive steel plant is about 1.75 lac tons.

The geological studies in the existing lease area of Iron Ore Mine has indicated common geological setup of the area & the factors like strike & dip, topography, mine workings and other structural features which have bearing on the assessment of the subject area confirms & proves the availability of Iron Ore.

In compliance to the proposals of exploration during the scheme period, exploration by DTH drilling was undertaken after prior intimation to Indian bureau of Mines under Rule 47 of MCDR-1988 and copy of the Form-J and Form-K is enclosed as **Annexure-01F**. The results & data obtained and furnished by the lessee from the drilled bore holes (DTH Drilling), geological investigations and exposed benches in working pit clearly visible have thus formed the basis for preparation of this Scheme of mining. The detailed exploration as per IBM guidelines shall be completed in a time bound manner by Core/RC drilling within this Scheme Period.

The lessee is holding one lease and no other Mining Leases in India. The copy is enclosed as **Annexure-02D**. The Latitude & Longitude of the three ground

control points which are located outside the lease as per Circular No.2/2010 are linked to one of the boundary point & it is incorporated in the Surface & Geological Plans and photographs of the same are also enclosed.

Table 01 - Latitude & Longitude of the three ground control points

Sl. No.	Ground Control Points	Latitude	Longitude	Remarks
1	GCP-1	N15^{O} 01' 30.6"	E76^{O} 38' 07.7"	'D' boundary point 606m towards SE directions of Pachamma Gudi/Temple.
2	GCP-2	N15^{O} 01' 31.2"	E76^{O} 38' 02.6"	'D' boundary point 617m towards SW directions of Culvert.
3	GCP-3	N15^{O} 01' 30.7"	E76^{O} 37' 55.1"	'D' boundary point 567m towards South directions of Sy.no.32,30 &19 of Navlalluti Village.

The prominent physiographic features, drainage pattern, water courses, PWD Roads are shown on all the plans and railway lines is shown on the key plan. The entire lease area and buffer zone falls in revenue & non-forest area. A study of the existing environmental scenario, assessment of impact on the environment due to the proposed mining operations and Environmental Management plan to mitigate adverse impacts and enhance beneficial impacts have also been incorporated in the Environmental Management Plan.

Thus, the Scheme of Mining & Progressive Closure Mining Plan for balance period (2011-12 to 2015-2016) is prepared under Rule 12(3) of MCDR 1988 & Rule 23(3) MCDR 1988 and is submitted to Indian Bureau of Mines, Bangalore for approval.

Brief Summary of Reclamation & Rehabilitation Plan : The Reclamation & Rehabilitation Plan (R&R) for sustainable management of environment has been formulated by Indian Council of Forestry Research and Education (ICFRE), Dehradun & the scope of the study include assessment of existing scenario and collection and analysis of environmental data pertaining to mining and allied activities such as topography of the area, production

technology, status of overburden dumps, top soil, soil conservation measures, environmental quality, to assess the impacts and formulation of site specific R&R plan. The proposed R&R Plan prepared by ICFRE has been aimed for the restoration of degraded environment employing site specific engineering & biological measures. For the stabilization of active, inactive and encroach dump, various bioengineering measures are proposed like toe wall, garland drain, coir matting, brushwood, logwood etc., Suitable tree species of timber, fodder, fuel wood and medicinal uses have been recommended for restoration of the disturbed areas and overall ecosystem development. Considering the importance of forest ecosystem in conferring valuable environmental services an area of 3.20 Ha has been earmarked for biodiversity conservation. The details of the proposed engineering measures & other protective measures proposed are described in detail along with the cost estimates in Chapter 5 of the approved Reclamation & Rehabilitation Plan. The estimated cost summary table is furnished below.

The production capacity based on reserves, dumps and road capacity has been estimated as 0.105, 0.16 and 0.29 million tones respectively. Considering the minimum among the three criteria, the annual production limit of 0.105 million tones is fixed. The estimated cost of the proposed Reclamation & Rehabilitation Plan is Rs. 159.12 lakhs (Rupees One Crore fifty nine lakhs and twelve thousand only).

Table 02 - Estimated cost summary of the proposed R&R measures :

Sl.No.	Items	Total Cost (Rs. lakhs)
1	Cost of afforestation of encroached area as per joint survey of CEC	7.86
2	Cost of Engineering Structures of encroached area as per joint survey of CEC	36.69
3	Cost of Engineering structures for OB dump management	34.64
4	Cost of Engineering structures for surface water management	24.90
5	Cost of afforestation of area under overburden dumps	27.96

6	Cost of afforestation of area under mining and others	22.22
7	Cost of afforestation of area under green belt	4.57
8	Cost of avenue plantation along the road	0.28
9	Social Management Plan (SMP), Biodiversity Management Plan, Monitoring and implementation of R&R Plan, capacity building, infrastructure etc.,	15% of the annual sale proceeds from the mines, in respect of "Category A" mine may be transferred to SPV for the purpose of taking up various amelioration and mitigative measures in district Bellary or as decided by task force to be constituted as per recommendation of Macro Level EIA Report and direction of Honorable Supreme Court of India for implementation of R&R Plan and EMP.
	Grand Total	**159.12* excluding the cost of SMP, BMP, Monitoring etc., as mentioned at item No.9 above.**

The time schedule for implementation of Mitigation/Engineering measures proposed in R&R Plan : refer Table no.55.

PART – I

1.0 REVIEW OF THE MINING PLAN

1.1 Name of the Mine

"Navalutti Iron Ore Mine" belonging to 'M/s. H.R.Gaviappa & Company', M.L.No. 2483.

1.2 Particulars of approval of Mining Plan (under MCR or MCDR, indicate approval letter No. and date)

The Mining plan was prepared and approved vide letter No.279/150/90/BNG dated 03-01-1991. The last Scheme of Mining after the renewal of the lease was prepared under Rule 12 of MCDR 1988 and approved vide letter No.MS/BLR/fe-83-SZ dated 16.11.2006 and further modified Scheme of Mining under Rule10(2) MCDR 1988 was approved vide letter No. MS/BLR/FE-83-SZ/575 dated 20.04.2010. The copies of the approval IBM Mining plan, Scheme of Mining & Modified Scheme of mining letters enclosed as **Annexure-01B.**

1.3 Date of commencement of mining operations

The commencement of mining operations was after the grant of the initial Mining Lease in the year 1956. Now the mining lease has been accorded Fifth renewal for 14 years 6 months *w.e.f* 24.04.2002 to 17.10.2016 as ML No 2483 over an extent 34.00 ha, including 2.0 ha of approach road area.

1.4 (a) Deficiencies, if any, that existed in the approved mining plan to be taken note of and rectified by incorporating suitable proposals for implementation in the scheme of mining.

No any such deficiencies were noticed in the approved Mining Plan/Scheme of Mining from Indian Bureau of Mines. The Mine was inspected periodically by IBM Officials and there were no violations of significant provisions of MCDR-1988 or specific conditions imposed having a bearing on mine planning and design. However, it is to be pointed out that the mine was under violations of Rule 13(1) of MCDR-1988 vide letter No.KNT/BLR/Fe-12/BNG/997 dated 31.05.2010 and compliance letter to above said violations were submitted by

the lessee on 23.09.2010. further contravention/violations vide letter No.283/1/2011/BNG/1643 dated 12/14.07.2011 under Rule 45 MCDR 1988, from Indian Bureau of Mines and subsequently lessee has given compliance letter to above said violations, the copy is enclosed **Annexure-01C**. Now all violations are rectified and except in the Iron Ore Production & Development there was a minor deviations due to stoppage of transportation & ban of mining by the Honorable Supreme Court order as discussed in the previous paragraphs.

Now, proposed ensuing "Scheme of Mining & Progressive Closure Mining Plan" for balance period (2011-12 to 2015-16) is prepared under Rule 12(3) of MCDR 1988 & Rule 23(3) MCDR 1988 incorporating the salient features observed mainly in respect of production capacity & sustainable ecology & environment to be implemented in accordance with the R&R Plan prepared by ICFRE & approved by CEC constituted by the Honorable Supreme Court.

(b) Review of compliance position of salient features of the mining plan on chapter wise basis bringing out marked deviations, if any, and justifications/reasons thereof. Items to be covered may include exploration, mine development, exploitation, afforestation programme, reclamation & rehabilitation, control of dust, noise & ground vibrations and any other significant feature.

The Mining Plan proposals were for mining of Iron Ore by mechanized opencast method of working. Accordingly, the mining operations were being carried out during the approved Scheme of Mining period of 2006-2011. The proposal for exploration involved drilling of boreholes. The details of the proposed exploration, production & development, afforestation etc., are also discussed in the paragraphs below.

(i) **Exploration:** As part of the exploration program during the approved Scheme period there were proposals for exploration by drilling 2 bore holes for exploration, which were not carried out during 2006-07 & 2008-09. The exploration was carried out by drilling 10 no's DTH bore holes during 2010-11 of the previous Scheme period with cumulative meterage of 760meters. The lessee has furnished that the exploration was carried out by engaging m/S. Global Environment & Mining Services, Hospet and cost incurred towards the

same is about 4,18,500/-.The same information is utilized for reserves estimations in preparation of the present Scheme of mining. The details of bore holes are as follows.

Table 03 - Summary of Bore holes

Year	No. boreholes Planned	Achieved	Difference /Deviation	No. of Trenches	Achieved	Difference /Deviation
2006 -2007	**02**	**Nil**	**-2**	**Nil**	**Nil**	**Nil**
2007 -2008	Nil	Nil	Nil	Nil	Nil	Nil
2008 -2009	Nil	Nil	Nil	Nil	Nil	Nil
2009-2010	Nil	Nil	Nil	Nil	Nil	Nil
2010 -2011	Nil	10	+10	Nil	Nil	Nil
2011 -2012	Nil	Nil	Nil	Nil	Nil	Nil
2012 -2013						
2013 -2014 Up to 30.11.13	Nil	Nil	Nil	Nil	Nil	Nil
Total	**02**	**10**	**+8**	**Nil**	**Nil**	**Nil**

ii) **Mine development & Exploitation:** The previous approved Mining Plan/Scheme of Mining proposals was to work for production of Iron Ore by Mechanized Opencast mining method as per the schedule below. The details of production planned achieved & deviation thereof is as follows:

Table 04 - Details of Proposed productions & development for Iron Ore (Quantity in Tones)

Year	Iron Ore Production Proposed	Achieved	Percentage of Deviation	Development proposed	Achieved	Percentage of Deviation	Ore :Over Burden
2006-2007	6,93,000	6,11,522	-11.75%	95,250	8,50,000	+792.39%	1:1.39
2007-2008	6,65,070	6,97,478	+4.87%	1,67,500	4,16,000	+148.36%	1:0.59
2008-2009	7,08,070	3,66,196	-48.33%	1,08,900	4,50,000	+313.22%	1:1.22
2009-2010	6,99,090	39,998	-94.23%	94,050	54,240	-42.33%	1:1.35
2010-2011	7,18,140	35,165	-95.10%	1,15,500	41,037	-64.47%	1:1.16
2011-2012	-	-	-	-	-	-	-
2012-2013	-	-	-	-	-	-	-
2013-2014 up to Nov - 2013	-	-	-	-	-	-	-
Total	**34,84,320**	**17,50,359**	**-**	**5,81,300**	**18,11,277**	**-**	1:1.035

Mining operations were carried out during the last Scheme of Mining and production & development was achieved as shown above. The bench heights were found to be formed erratically more than 9-10 mtrs in certain places of the ore zone & few benches were observed to be merged/collapsed forming high walls. These have to be rectified during the present scheme period. The Production target was achieved during the first two years & further as development work was taken up during the third year, the production target could not be achieved resulting in reduced output. The development was more than the planned proposals due to change in geology and geometry of the ore body & waste in comparision to the approved mining plan. There were transportation bottlenecks due to few local problems & due to this practical constraints, production was reduced during the fourth & fifth year. Subsequently due to ban of mining operations from the Month of July 2011, there were no activities till date. So, proposals of the previous scheme of mining (2006-2011) could not be achieved in full.

iii) **Afforestation programme:** As part of Afforestation programme it was envisaged to plant 60000 saplings covering an extent of 12.00 Ha. During the Mining Plan/Scheme of Mining period of seven years, i.e. from the 2006-2014 up to 31.10.2013 about 7700 saplings were planted within lease area & outside lease area. Mine development works were carried out systematically in proportion to the production.

Table 05 - Details of Afforestation programme

Year	No of saplings (planned)	No of saplings (Achieved)	Percentage of Deviation	Survival rate in %	Name of species
2006-2007	20,000	1500	-92.50%	50.00%	Agave, Eucalyptus and Neem and grass.
2007-2008	20,000	1200	-94.00%	50.00%	
2008-2009	20,000	600	-97.00%	50.00%	
2009-2010	20,000	900	-95.50%	50.00%	
2010-2011	20,000	1100	-94.50%	50.00%	
2011-2012	-	1050	+100%	-	
2012-2013	-	1350	+100%	-	
2013-2014 up to Octbr-2013	-	-		-	
Total	**60,000**	**7700**	**-**	-	

Since the entire lease area is required for mining activity and as the ore/mineral body continues to a further depth, no refilling or reclamation activities other than afforestation is carried out in the lease area. The dust suppression is being done by spraying water all along the haul roads and by implementing afforestation programme, no land reclamation or rehabilitation works were required during the past Scheme period. Afforestation programme were carried out during the last Seven years less than the proposals made in the Scheme of Mining till the period (2006-2011). Further, the lessee has stated that due to Honorable Supreme Court decision mining operations were stopped for the past two & half years due to which afforestation works were not carried out.

iv) **Reclamation & Rehabilitation:** Reclamation of the pits has not been done keeping in mind the further development of the mine & conservation of the mineral in view of the continuity of the deposits. Only stabilization & afforestation works as discussed in the above para has been carried out.

v) **Control of Dust, Noise & Ground Vibrations:** Dust suppression is being done by water spraying along the road and afforestation. To assess the effect of mining activity on the air environment, parameters like SPM, SO_2 & NOx were monitored at stations for ambient air quality within the lease area. Monitoring stations were set up for the period from August to September 2013. The Environmental monitoring data collected by Global Environment & Mining Services are enclosed. Regular monitoring of noise levels has been carried out at 5m-10m from HEMM as well as distance from their cabin & the data is enclosed.

Measures are being adopted to reduce ground vibrations by using systematic blasting techniques with milli-second delay & adopting appropriate blasting schedules. Since, during the Scheme of mining period there was proposals for deep hole drilling & blasting and planned to be worked by deploying heavy earth moving machineries, noise levels would be present at the excavation area and loading points, and vibration levels and were within the prescribed limits as all precautionary measures like use of delay detonators, sound proof

cabins for operators & ear muffs to all employees working near the machineries, regular maintenance of machinery etc., were taken up.

(c) Review of the compliance position of conditions and stipulations imposed, if any, while approving the mining plan. In case of non-compliance/partial compliance, detailed justifications / reasons thereof may be furnished along with proposal for compliance in the ensuing period.

No specific conditions were imposed in the approved Mining Plan/Scheme of Mining.

(d) Review of compliance of violations pointed out after inspections made under MCDR, 1988 during last 5 years. The position emerging out of the yearly review of the mining plan while checking up implementation of the mining plans in the field shall also be taken note of at this stage.

There were violations pointed out during the inspections under MCDR, 1988 during the last Seven years 2006-14(up to October 2013). As per the site inspection by IBM official's, it is to be pointed out that the mine was under violations of Rule 13(1) of MCDR-1988 vide letter No.KNT/BLR/Fe-12/BNG/997 dated 31.05.2010 and compliance letter to above said violations were submitted by the lessee on 23.09.2010. further contravention/violations vide letter No.283/1/2011/BNG/1643 dated 12/14.07.2011 under Rule 45 MCDR 1988, from Indian Bureau of Mines and subsequently lessee has given compliance letter to above said violations, the copy is enclosed **Annexure-01C**.

Now all violations are rectified and except for the previous proposals in the Iron Ore Production & Development there were minor deviations due to stoppage of transportation & ban of mining activities.

(e) Any other points requiring attention in the interest of proper mine design development & conservation and environment & ecology of the area.

M/s. H. R. Gaviappa & Company has proposed to develop the mine systematically in a scientific manner & has earlier explored the potential Iron Ore deposits by exploratory drilling & mining operations (during the mining plan/Scheme of mining period) which yielded positive results showing depth

persistence of the deposit both qualitatively & quantitatively. The updated Geological Plan for preparation the Scheme of Mining is enclosed. The method of mining is proposed to be Mechanized Opencast Method of mining during the ensuing Period (2011-2012 to 2015-2016) of Scheme of Mining & Progressive Closure Mining Plan prepared under Rule 12(3) of MCDR 1988 & Rule 23(3) MCDR 1988 and submitted to Indian Bureau of Mines, Bangalore, for approval.

Afforestation proposals and environment management proposals like construction of check dams, garland drains, silt arresting bunds at the foot of the dumps etc., will be taken up during the ensuing Scheme of Mining period being discussed para 11.6 .

PART – II

2.0 PROPOSAL UNDER SCHEME OF MINING FOR THE NEXT BALANCE PERIOD

2.1 Name and address of the applicant:

Name of Applicant	: M/s. H.R.Gaviappa & Company **Sri. Hirehal Gaviappa Rangan Goud** Managing Partner
Address	: 3rd Floor, H. R. G. Complex, HRG Circle, BELLARY
Taluk	: Bellary
District	: Bellary
State	: Karnataka
Pin Code	: 583101
Telephone Numbers	: (080) 25586162
Fax	: (080) 41328183
E-mail	: sumithramkt@hrgmining.com

Status of Applicant: Partnership Company

(The partnership deed copy is enclosed **Annexure-02A,** Partners details copy enclosed **Annexure-02B &** Photo ID copy of H.G. Rangangoud is enclosed **Annexure-02C).**

2.2 Name and address, registration number of the recognized persons together with validity date/person employed under Rule 42(1)(b) who has prepared the mining scheme.

Shri Ravi Kumar.S B.E., (Mining)
RQP/BNG/167/2002/A and Valid up to 31.03.2022

&

Dr. C.P Prasanna Kumar M.Sc., (Appli. Geo), PhD, FGS.
RQP/BNG/168/2002/A and Valid up to 23.04.2022

No 344/2, 2nd Floor, Sampige Road,
11th Cross, Malleshwaram,
Bangalore - 560 003
Phone No/Fax: 080-23465846
Email-gemsolutions2003@gmail.com

RQP certificates are enclosed in **Annexure-05**

2.3 Mineral(s) to be mined

The lessee intends to continue mining of Iron Ore as per the lease granted.

2.4 Area and date of expiry of the lease

The lease area is over an extent of 34.00Hectares (Including 2.00Hectares of approach road) is situated in Navalutti Village, Sandur Taluk, Bellary District, in the State of Karnataka granted for a period of 14years and was valid from 24.04.2002 and up to 17.10.2016. The mining lease deed copy is enclosed as **Annexure-01A.** The area of ML as per CEC Digitized sketch is 32.34 Ha.

Table 06 – Administrative Details of the Lease Area

District	Taluk	Village	Khasra/ Plot No.	Area in Ha.	Area under Forest Land	Ownership & Occupancy
Bellary	Sandur	Navalutti	Donimalai Forest land	34.00Hectares(including 2.00 Hectares of approach road) The area of ML as per CEC digitized sketch is 32.34 Ha	34 Ha (32.34 Ha as per CEC Sketch)	Govt. Forest land – Forest Clearance obtained.

2.5 Date of expiry of 5 years period for which approved on the last occasion.

The last Scheme was prepared under Rule 12 of MCDR 1988 and approved vide letter No.MS/BLR/fe-83-SZ dated 16.11.2006, and modified Scheme of Mining under Rule10(2) MCDR 1988 and approved vide letter No. MS/BLR/FE-83-SZ/575 dated 20.04.2010. The copies of the approval letters of IBM Mining plan, Scheme of Mining & Modified Scheme of mining letters enclosed as **Annexure-01B.**

3.0 RESERVES:

The reserves estimation carried out during the earlier approved mining plan (2006-2007 to 2010-2011) was as on **31.03.2006**. The reserves were calculated by conventional Cross Section method taking into consideration the exploration carried out by Trial pits & depth persistence of the deposits. The geological reserve was 67.91 lac tones out of which the proved reserves of 43.14 lac tons & 12.43 lac tons of probable reserves.

3.1 Category wise (proved, probable and possible) reserves estimated in the earlier mining plan with grades)

Reserves have been calculated by cross sectional method for estimation of Iron Ore deposits reserves the following parameters have been utilized in the approved Mining Plan.

i. The shape, size & depth extension of the ore body as inferred in the cross section have been considered for reserve estimation.

ii. The influence along the strike. For each cross section has been taken as half the distance from the cross section on one side & up to the demarked limit of the ore zone on the other side.

iii. The limiting reserves based on the existing working pits and adjoining mining working depth is taken for proved category, below the proved depth, reserves estimations calculation considered for probable & possible category.

iv. The bulk density 3.5 m^3/tones are taken for Iron Ore deposits and Overburden is 2.5 m^3/tones and ROM recovery is about 100%(70% of iron ore in the form of fines i.e-10mm size & 30% of lumpy iron ore i.e +10mm size; ***Source: approved Scheme of Mining page No.10 under para5.0)*** for Iron Ore deposits.

v. The cut-off grade has been considered as follows: -
The cut-off grade for mineral reserves purpose has been considered up to threshold limit prescribed by IBM (Iron ore: 58% Fe content) and the general characteristics of Iron Ore in the mine is found to be 45%-

63%+ Fe. Representative samples are collected from the lease area in all the three blocks and the locations of the same are shown on the Surface Geological Plan. Iron Ore outcrops are obtained at the locations shown by chipping & the representative sample is taken to the laboratory after coning & quartering.

Table 7 – Reserves/Resources & Grade (Quantity in tones)

Sl. No.	Category of Reserves	**Iron Ore** Grade ranges from 45.00% to 63.00% + Fe
01.	**111** (Proved mineral reserves)	26,38,844
02.	**121+122 (Probable mineral reserves)**	12,43,200
03.	**333 (Inferred mineral resources)**	12,33,820
	Total	**51,15,864**

(Source: Modified Scheme of Mining dated 20.04.2010 page no.6.)

3.2 Depletion of reserves:

The mineable reserves as per approved Mining Plan/Scheme of Mining were 38.82lakh tons which has been estimated from this lease & production achieved during the period 2006-14 (up to November 2013) is about 17.50 lakh tons leaving behind reserves of 21.32 lakh tones of Iron Ore.

Table 8- Depletion of reserves during the Previous Mining Plan Period:

Sl. No.	Category of Reserves	Iron Ore in lakh tones
01.	Reserves (as per approved Scheme of Mining (2006-2007 to 2010-2011)	38.82
02	Depleted Reserves (2006-2014) up to October 2013	17.50
03	Balance Reserves	**21.32**

The above figures are in comparison to the reserves as per previous approved modified Scheme of Mining. The reserves as discussed in the paragraph 3.1 are now re-estimated based on the latest exploration carried out in compliance to UNFC Guidelines.

3.3 Additional reserves established category wise (with basis and parameters considered).

The geological reserves established/estimated in the previously approved Mining Plan/Scheme of Mining were not UNFC Compliance in terms of exploration inputs. The resources/reserves were thus established by geological sections based on Geological mapping & exploration.

The exploration results of the lessee carried out by drilling 10 DTH Holes during 2009-10 and mine workings/exposures is utilized in re-estimation of reserves. The total Mineral Reserves as on date (re-estimated) is 14.85 lac tones which will suffice the proposed plan period & the future requirements also. From the cross sectional area of Iron Ore, volume of the in-situ reserves are estimated by multiplying with the sectional influence. The Iron Ore reserves from the area are categorized as proved category in accordance with UNFC Guidelines as Category G1, G2 & G3.

The shape, size & depth extension of the deposit as inferred in the cross section have been drawn based on exploratory drilling bore hole data & mine working pit depth and working benches information available.

- The geometry of the ore body of lease area; the Iron ore deposits strike wise 300m length and average width is about 60m and average depth is about 60m. The nature of mineralization is banded Iron formations/Banded Hematite Quartzite. The iron occurs in three forms powdery ore /blue dust, Lumpy ore and Float Iron ore.
- The influence along the strike. For each geological cross section has been taken as half the distance from the cross section on one side & up to the demarked limit of the mineral deposit on the other side up to the last point of exploratory drilled bore hole and maximum depth only.
- The average grades of different types of Iron Ore have been considered on the basis of sample collected & analyzed from the working bench samples.
- The average Bulk density is considered 3.5tones/m^3 and recovery of the Iron Ore is 80% of ROM & remaining 20% is Sub grade and waste/Overburden is 2.5tonnes/m^3. The bulk density & recovery factor is

considered based on the test results & earlier mining operations as previous approved Mining Scheme.

- The cut-off grade has been considered as follows: -

  The cut-off grade for mineral reserves purpose has been considered up to threshold limit prescribed by IBM (Iron ore: 45% +)

Representative samples are collected from the lease area & the representative sample is taken to the laboratory after coning & quartering. The chemical analyses for Iron Ore are attached as **Annexure-04A.** Bore hole loggings enclosed as **Annexure-04B.** Detailed section wise calculation for estimation of reserves & resources is enclosed as **Annexure-03A-03B.**

3.4 Category wise updated reserve with grade (indicate end use grade with analysis) as well as marginal grades.

The reserves have been estimated by sectional method. Geological cross sections have been drawn at 15-100mtrs interval and Iron Ore deposit contact and structure is drawn based on the drilled DTH bore hole data, surface exposures, existing working pit depth and other field geological information's. Details of the reserves calculations are enclosed as **Annexure-03.**

Reserves & Grade: The G1, G2 & G3 Category reserves updated after re-estimation is **3.347million** tones (Category 111: 0.496 million tons, Category 121&122: 0.989million tones, Category 211: 0.189million tones, Category 222 :1.410 & Category 333 :0.263million tones) of Iron Ore and the grade ranges from 45% to 63% + Fe Content. Further, the Geological reserves & grade is as per the exploratory mining operations carried out by the lessee & as per the geological mapping of lease area; the G1–Category (111)Proved mineral reserves is considered based on drilling carried out by 100mX100m interval grids and G2-category (121&122)Probable mineral reserves is considered based on drilling carried out by 200mX200m interval grid bore holes and the borehole logging data is obtained for mineral reserves/resources estimations. G3-Category Inferred mineral resources are estimated taking into consideration the exposed outcrops/float ore deposits & the average depth

persistence exposed by earlier workings. Feasibility mineral resources category G1(211) is considered by estimating the reserves blocked in the statutory barriers and similarly Pre-feasibility mineral resources category G2(222). The strike length influence & lateral influence is taken only up to the last exploration point and no depth ward influence is considered to estimate the reserves beyond the explored depth for G1,G2 & G3 Category resources are calculated as per UNFC Guidelines. The UNFC Codification is accordingly assigned. The blockage of reserves in float iron ore area is not considered as it is falling within the area demarcated for biodiversity and 7.5 m safety barrier.

Table 09 - Summary of Iron Ore Resources of the above (as on 01.10.2013)

Resources	Iron Ore (in Million Tones)
G1 RESOURCES	6,85,202
G2 RESOURCES	23,99,222
G3 RESOURCES	2,63,295
Total	**33,47,719**

Table 10 - Summary of Iron Ore Resources of the above (as on 01.10.2013)

Resources	Iron Ore (in Tones)
G1 RESOURCES	9,50,303
G2 RESOURCES	23,99,222
Total	**33,49,525**

Table 11 - Summary of Iron Ore Mineral Reserves

Mineral Reserves	Iron Ore (in Tonnes)
Proved Mineral Reserves (111)	4,96,139
Probable Mineral Reserves (121&122)	9,89,215
Total	**14,85,354**
***Sub grade**	**3,71,339**

*Sub grade:40%-44.99% or up to 45% Fe content.