MINING PLAN

OF

MOHAGAONGHAT AREA FOR MANGANESE ORE
IN KATANGI TAH., BALAGHAT (M.P.)
FOR 69.22 ACRES OR 28.01 HECTARES),

OF

ARPAN FERRO ALLOYS,

(PROP : SMT. HEMLATA CHATURMOHTA)
KOSMI, GONDIA ROAD,
BALAGHAT (M.P.)

ARPAN FERRO ALLOYS

MANUFACTUR OF FARRO MANGANESE (LOW CARBON)
KOSMI- BALAGHAT (M. P.) 481001 ☎ 2165

Ref.

Date : March 199

CONSENT LETTER FROM APPLICANT

The Mining plan in respect of village Mohagaon Ghat (Village) are for 69.22 Acres (28.01 hectares) mineral Manganese Ore in Listt : Balaghat (M.P.) has been prepared by Shri S. V. Gokhale Registration No. NGP/NGP/002/87/A. We request Regional Controller of Mines, Nagpur Region, Nagpur , to make further correspondance regarding modification of the Mining Plan with t said recongnised person on his following address :-

Shri S. V. Gokhale
" Annapurna "
2-D, Hindustan Colony,
Amravati Road,
Nagpur- 440 010

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We hereby authorise that all the modification so made in Mining Plan by the recongnised person be deemed to have been ma with our knowledge and consent and shall be acceptable to us an bining on us in all respects.

Signature
for ARPAN FERRO ALLOYS.
(Hemlata. हेमलता चतुर्मोहता
Chaturmohata)

क्षेत्रीय खान नियंत्रक (ना. क्षे)
Regional Controller of Mine (N R.)
भारतीय खान ब्यूरो, नागपूर
Indian Burcau Of Mines, Nagpur.

MINING PLAN

OF

MOHAGAONGHAT AREA FOR

MANGANESE ORE

IN WARASEONI TAH., BALAGHAT DISTRICT OF MADHYA PRADESH

(MINING PLAN PREPARED FOR 69.22 ACRES OR 28.01 HECTARES),

OF

ARPAN FERRO ALLOYS

(PROP : SMT. HEMLATA CHATURMOHTA)

KOSMI, GONDIA ROAD,

BALAGHAT (M.P.),

UNDER RULE 22 M C R 1960

(FOR FRESH MINING LEASE)

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पत्र संख्या द्वारा
VIDE LETTER No BGT/MN/MPLM-357/NGP dated 9.5.94

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CONSULTANT

SHRI S. V. GOKHALE

NAGPUR

RQP NO : RQP/NGP/002/87/A
(Renewed upto 13.8.95)

S.V. Gokhale

9/5/94

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Regional Controller of Mine (N.R.)
भारतीय खान ब्यूरो, नागपुर
Indian Bureau Of Mines, Nagpur.

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A N N E X U R E S

P L A T E S

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Indian Bureau Of Mines, Nagpur

1. INTRODUCTION

1.1 Brief History of the Concern :

A Proprietary concern by the name and style as Arpan Ferro Alloys, (Prop : Smt. Hemlata Chaturmohta) Kosmi, Gondia Road, is a newcomer to the field of mining and marketing minerals and who also proposes to establish a metallurgical industry to produce Ferro Alloys. The proprietor will engage adequate expertise in undertaking the mining operations with proper personnel and required finances.

1.2 Details of other Mining Leases held by M/s. Arpan Ferro Alloys :

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Smt. Hemlata Chaturmohta does not hold any other Mining Lease anywhere in India.

(i) The date of S. O. proposing to grant Mining Lease .. 4 - 12 - 1993

This Mining Plan is prepared on the basis of Letter No : [illegible] dated 4.12.93 from the Under Secretary, Natural Resource Department, Govt. of M.P., Bhopal, proposing to grant an area of 69.22 acres or 28.01 Hectares Since, the area applied for grant of Mining Lease is 69.22 acres from village Mohagaonghat and the area proposed to be granted under Mining Lease is also 69.22 acres, this is the entire area. A copy of the letter is enclosed as Annexure No.

VIDE LETTER No SGT/[illegible]/MPLN-354/NGP dated 9.5.94

The area has a long history of Mining of Manganese ore. In the year 1951, shri. Rameshwarji Agarwal, Katangi, Distt. Balaghat, was holding the same area under P.L. However, the area was granted under Mining Lease to M/s Bhilai Steel Plant, Bhilai, from 26.2.66 to 25.2.86. However, after mining of Manganese ore, for some period, M/s Bhilai Steel Plant surrendered the area sometime in 1970 or so. M/s Bhilai Steel Plant have left behind old pits from where Manganese ore was raised. Thus, it is quite evident that the ground for mining purposes was broken much before 1980, the year from which Forest Act, restricting fresh mining activity in forest land, came into existence.

On 22.7.1992, the area was thrown open for regrant, by Gazette Notification by the Government of M.P. Arpan Ferro Alloys, Prop. Smt. Hemlata Chaturmohta, applied for the entire area of 69.22 acres for grant of M.L.

2.0 GENERAL

2.1 Name and Address Of The Applicant :

Arpan Ferro Alloys,

Prop. : Smt. Hemlata Chaturmohta,

Kosmi, Gondia Road,

Balaghat - 481 001 (M.P.). Telephone No 2165

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Indian Bureau Of Mines, Nagpur

2.2 Status of the Applicant :

A proprietery concern. Other details are given in 2.1 above.

2.3 Mineral or Minerals which the applicant intends to mine :

Manganese Ore

2.4 Name , Address and registration number of the recognised peroson who prepared the mining plan. :

Shri S. V. Gokhale (M.Sc Geology)
"Annapurna", 2-D Hindusthan Colony,
Amaravati Road, NAGPUR - 440 010
RQP NO : RQP/NGP/002/87/A (Renewed upto 13-8-1995)
Telephone No :523 209

2.5 Name and address of Prospecting Agency:

On the basis of the old workings of Manganese ore in this area, the Lessee applied for fresh grant of Mining Lease.Before this, the occurrence of manganese Ore in the area, its grade etc., was ascertained by the Applicant.

2.6 Details of the Area : अनुमोदित APPROVED

The area as under is granted under renewal of Mining Lease

District & State	Taluka	Village	Khasara No Plot no/ Block range/ felling series etc.	Area in Acres	Ownership
Balaghat M. P.	Waraseoni	Mohgaonghat	W.O.396	69.22 :	Govt. revenue land
				Total :	69.22 acres or 28.01 Hectares

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A copy of the Khasra statement from the Patwari of the village is enclosed as Annexure No. 2.

Khasra plan showing the area proposed to be granted under Mining Lease is enclosed as Plate No.1.

Khasra Plan showing area of about 500 m surrounding the Mining Lease area is enclosed as Plate no 1A, as Environmental Plan (Land Use Plan).

2.7 Period for which the Mining lease is required :

Mining Lease required to be granted is for a period of 20 years.

S. V. Gokhale

2.8 Infrastructure :

Mining expertise with technical personnel, will be acquired as and when required. Adequate finance to carry on systematic mining operations is available with the applicant.

1. WATER - Drinking water is available in a well situated at a distance of about 2 Km. in Mohagaonghat village, due East outside the area. This water is being used for drinking purposes for many years by villagers.

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2. ELECTRICITY - The nearest pole from where supply of electricity may be available is situated at a distance of about 2 Kms. in Mohagaonghat village.

3. ROAD - The area is approachable by an all-weather from Katangi (16 Kms) on Katangi - Tumsar road and by taking a bifurcation from Garra Chowki to village Miragpur (6 kms). From Miragpur, a seasonal Kuccha road, passing through village Mohagaonghat, leads to the area, (about 3.5 Kms.)

4. RAILWAY STATION - Nearest R.S. is Katangi, (N.G.) about 27 Kms and Tirodi (B.G.) about 26 kms from the area.

5. LABOURERS - Adequate number of labourers is available from near by villages.

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3.0 GEOLOGY AND RESERVES.

3.1 Physiography :

The area is situated along the slope of the hill (the highest point of the hill with 382 MRL and the ground level with 305 MRL. The area is sloping towards South & West. There is no perennial or seasonal water stream or nalla in the area. Though the area is a Govt. Revenue land, there is fairly thick growth of vegetation in the area. There is no top soil in the area. The average MRL of the area on which most of the old workings of Manganese Ore are situated, is about 352.

The area lies at the cross section of Latitude of 21 degrees 36' 37" and Longitude of 79 degrees 22' 24" and is covered under toposheet no 55 O/14, enclosed as in Plate no 2, Key Plan (Location Plan).

3.2 Geology :

Regional Geology

The Dharwarian System covers large connector areas within Madhya Pradesh and Bihar, spreading over Balaghat, Nagpur, Bhandara, Chhindwara and over Hazaribagh and Rewah. In these area it possesses a

highly characteristic metalliferous facies of deposits.

The Dharwarian rocks of the Nagpur , Chhindwara and Bhandara districts of Madhya Pradesh have been named as Sausar series.These rocks type carry important economic deposits of Manganese Ores. The Sausar series have been sub-divided into stages which have a wide geographical extent in Madhya Pradesh and can there fore be correlated in distant outcrops of the series.

Named Gondite from the Gonds of Madhya Pradesh by Dr. L. Permor, these are a series of metamorphosed rocks belonging to the Archaean and Dharwar System and largely composed of quartz, spessartite, rhodonite and other manganese silicates. These rocks are supposed to be the product of the dynamic metamorphism of mangani ferous clays and sands deposits during Dharwar times.

Out crops of the Gondite series are typically developed in Balaghat, Chhindwara Dists of M.P. & Nagpur & Bhandara Dists of Maharashra State & also in Panch Mahals of Gujrat & Banswara area of Rajesthan.

Manganese Ore & Gondite Horizon is assigned to Mansar Stage & Lohangi Stage of Sausar Series. In this case it is Mansar Stage.

Geology :

Local Geology:

The idea of the geological formations can be had from the surface as well as a number of old abandoned pits in the area.

There are five formations -

i) Soil
ii) Laterite ; Thickness 0-3 m.
iii) Biotite Schists with Quartzite Bands
iv) Manganese ore bed with Gondite : Thickness about 2 m.
v) Mica Schists (excluding Gondite formation)

i) Soil is pale brown in colour and is formed due to decompositions of country rocks (i.e. mica schists). The overburden consisting of soil & mica schists is having a thickness of about 5 metres. The area is also strewn with fragmented quartz originated from quartz veins in the country rocks.

ii) Laterite : This formation is found to occur in the Southern portion of the area at a lower level than 320 MRL. The laterite is Buff to deep brown in colour.

iii) Biotite schists with Quartzite Bands : This formation is found to occur mostly on the footwall side (northern area) of manganese ore band. The predominance of Biotite is in this formation is quite obvious. Also there are thin layers and lenses of quartzite in this formation. This formation maintains N-E : S-W

S V Lokhande

strike line with angles of dip from 40 to 60 degrees, towards South-East.

iv) Manganese ore with Gondite. This is a distinct formation, in Bedded form, well exposed all along the length of the old abandoned pits. The strike line of the ore body is the same as the country rocks with dips of about 60 to 70 degrees towards South-East. The correct measurement of true thickness of the occurrence of Manganese Ore could not be ascertained as the old pits in the area are also silted. However, from the observations of old pits outside the area on the Eastern as well as Western sides, it is assumed that the ore body is having a thickness of about 2 m. excluding Gondite formation. This formation is found to occur in entire breadth of the area from Eastern to Western boundary.

The inferred continuity of Manganese ore band is assumed on the North Eastern side of the pits upto the boundary of the applied area.

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In addition to the Bedded deposit of Manganese Ore, there is also an occurrence of Float deposit of Manganese Ore in the area upto 2 m. from surface (340 MRL). The Float deposit is found to occur immediately to the South of the Manganese Ore in Bedded form. This is evident from old shallow workings for Float Ore in the area. The total area over which it will occur is about 315 m. x 50 m. Out of this, an area of 50 m. x 50 m. is found to be worked out. There is an ore zone of about 0.4 m. thickness below overburden of about 1.6 m.

ii) Mica Schists. These form the hanging wall formations of the Manganese ore band with Gondite.

The formation maintains a strike of N-E : S-W, with dips towards South East varying from 60 to 65 degrees.

The Geological Plan prepared on 1 : 1000 scale with contours, is enclosed as Plate 3 and Geological sections on same Scale, are enclosed as Plate 4.

3.3 Details of exploration

i) Already carried out in the area.

It is reported by the Applicant that till to-day exploration was done on the basis of Geological studies and sampling of ore from old pits. In all there are 12 abandoned old Pits. Pit Nos. 1, 2 and 9, 10 are for Float Deposit whereas Pit Nos. 3 to 8, 11 & 12 are for Bedded Deposit. The details of the Pits such as dimensions are given in Chapter 4, MINING.

ii) Proposed to be carried out :

(a) For Bedded Deposit :

It is now proposed to give two trial pits of about 5 m. x 5 m. x 4 m. to prove the occurrence of the Ore body.

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It is also proposed to give four inclined bore holes, at an angle of 60 degrees, towards North, to prove continuity of ore band, laterally & in depth.

The details are as under :-

B.H. No.	1	2	3	4
From-To-MRL	348 To 334	352 To 337	352 to 337	352 to 337
Length of bore hole	15.5	12.5	15.0	15.0

(b) For Float Deposit : अनुमोदित APPROVED

It is proposed to give ten trial pits, measuring about 2 m. x 2 m. x 1.5 m.depth, to prove existence of Float ore deposit in the potential area.

The proposed exploration as above will be done under supervision of S.V. Gokhale , Geologist, and will be taken up immediatly after execution of the Mining Lease Deed and completed in two years time.

The locations of bore holes are marked on Geological Plan, Plate no 3.

Manganese ore in the area, will be reworked & assigned to the proper classification. The results will be communicated to the Indian Bureau of Mines, Nagpur.

3.4 METHOD OF ESTIMATION OF RESERVES :

The reserves of Manganese ore in the area are worked out for Bedded deposit as under : क्षेत्रीय खान नियंत्रक (ना. क्षे.) Regional Controller of Mine (N R) भारतीय खान ब्यूरो नागपुर Indian Bureau Of Mines, Nagpur

1) Proved Category
2) Probable Category
3) Possible Category

1) Proved Category : Reserves in this category are estimated as :

a) The known strike length of ore body in old Pits and includes 50 % area of influence of the strike length of ore body in unworked area considered, i.e., from N-E to S-W boundary of the area.

b) The depth of mineralisation is considered from floor of the Pits upto 344 MRL.

c) Inclined depth is worked out on the basis of the angle of the dip which is taken to be 65 degrees towards S-E.

d) The average thickness is considered to be 2 m.

e) The Bulk Density is 3 T/ Cu m.

S.V. Gokhale

2) Probable Category :

a) The entire strike line length of ore body, from from N-E to S-W Boundary is considered.

b) The depth is considered from 344 to 338 MRL.

c) Other factors remain the same as above.

3) Possible Category :

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a) The entire length of ore body, from NE to SW boundary is considered.

b) The depth is considered from 338 to 334 MRL.

c) Other factors remain the same as above.

The reserves only in Probable Category are worked out for the Float deposit available in the area.

Therefore the reserves, in Tonnes, are calculated as Total volume x Bulk Density.

The detailed calculations of the reserves in the area are given in Annexure No. 2.

Bulk density 3 T/Cu. m. for Bedded deposit
Bulk density 2.5 T/Cu. m. for Float deposit.

3.5 Geological Reserves and Grades:

1) The summary of Geological reserves in Proved, Probable & Possible categories is as under :-

(a) Bedded deposit :

A) Proved category reserves (upto 344 MRL)	13373.16 T
B) Probable category reserves (upto 338 MRL)	12511.80 T
C) Possible category reserves (upto 318 MRL)	8316.60 T
Total :	34201.56 T

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Continuity of ore body in depth upto 328 MRL, for estimation of Proved Category reserves, is taken on the basis of the deepest level of Pit No. 1.

In the Eastern and Western part outside the area, there are large abandoned pits which were being worked earlier and have reportedly reached a depth of about 15 m. from surface.

Average thickness of ore body of 2 m. is considered on the basis of measurements in these pits outside the area.

Average angle of dip considered is 65 degrees and accordingly inclined length of ore body is considered.

The depletion due to mining so far has not been considered because the details of earlier workings are not available. The calculations are made on the basis of the cross-sectional area from the floor of the pit in case of old pits and from surface in case of unworked area as per the workings as on the date of survey.

(b) Float deposit :

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Probable Category reserves 13250.00 T

The detailed calculations of reserves are given in Annexure No 4.

As mentioned in 3.3, after proposed exploration, the reserves will be reassessed.

Copy of one analysis result is enclosed as Annexure 4. Additional samples which include marketable grade, sub-grade and mineralised rejects are being analysed. These results will be enclosed alongwith the modified Mining Plan.

The average range of chemical composition of Manganese ore, as reported, should be as under :

44 % Mn and above	.....	15 %
40 to 44 % Mn	.....	45 %
27 to 39 % Mn	.....	15 %
23 to 27 % Mn (Sub grade)	.....	5 %
Mineralised rejects	.....	20 %

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Thus the ROM will have a range of 26 % to 44 % Mn contents including some portion of sub-grade ores from 24 to 26 % Mn contents.

	Marketable Grade	Sub-grade	Mineralised Rejects
Mn	26 & above%	< 26 To > 23 %	< 23 %
Fe	11 %	> 11 To 15 %	> 15 %
SiO2	25 % & below	> 25 To< 30 %	> 30 %
P	0.3 % & below	> 0.3 to <0.35%	> 0.4%

The range of impurity percentages is variable, and decide the marketability of the ore.

3.6 Mineable reserves and anticipated life of the mine:

(a) For Bedded Deposit :

For working out Mineable reserves & anticipated life of the mine, the reserves only in Proved & Probable categories are considered.

	Tonnes
1. The Geological reserves in Proved & Probable Categories : (upto 338 MRL)	25884.96 T
(Proved Category ..... 13373.16 T + Probable Category .. 12511.80 T)	

2. Less ore trapped in 7.5 m zone on NE & SW side of strike - line length, as mining limit zone

15 m L x 15.44 m D x 2 m Th x 3 B.D = 1388.6 T
(inclined depth)

3. Less over trapped in block between ultimate development Pit limit & mining limit.
28 x 15.44 Sq m x 2 m Th x 3 B.D. = 2595.14 T

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Total 21900.22T

3. Graded ore recovery at 75 % of the above 16425.17 T
or Say 16000.00 T

4. Sub-grade 5 % of ROM 1095.01 T

5. Balance is mineralised rejects

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(b) For Float Deposit :

Total Tonnage available in Ore Zone 13250.00 T

Less : Ore trapped in 7.5 m. zone of mining limit on Eastern and Western side Negligible

Graded Ore recovery at 25 % of the above 3312.5 T
Or say 3300 T

Sub-grade 5 % 662.5 T

Balance 70 % mineralised rejects

Thus, mineable reserves -- from Bedded deposit 16000 T
from Float deposit 3300 T
Total 19300 T

Therefore Anticipated life of mine will be 20 years as below :

Production for first five years 3900 T

Production for next fifteen years @ 1000 T per year 15000 T

The life of the mine will go up & hence will be reworked after the results of exploration are known.

4.0 MINING

As mentioned earlier, the area was worked in the past on small scale as is evident from the existing pits and dumps, for Bedded deposit as well as for Float deposit. The production & despatch figures of Manganese Ore of that period are not available.

The Applicant (Lessee) has been informed that the mining operations in the first year of working, after the execution of the Mining Lease, will be taken up as shown in the Five Year Development Plan, Plate 6. The Applicant fully agrees to start mining only in the area as proposed.

The mining activity will consist of :-

(a) For Bedded Deposit :

1) Removal of overburden and soil & waste rocks to the dump-sites.

2) Mining of manganese ore bed with drilling & blasting.

3) Removal of mined ROM to surface yard for proper breaking, sizing, sorting, stacking & zigging etc. Flow sheet is enclosed as Annexure No. 5.

4) Preparing grade wise stacks of ore for delivery.

5) Dewatering of the working pits may not be required as there is no seepage of underground water.

6) During mining operations proposed in this Mining Plan, over a period of five years about 60 to 80 trees are likely to be cut for Bedded ore mining.

7) Since the proposed Pits will be situated on the slope of the hill , there is possibility of Pits getting silted up due to water flow , it is proposed to dig one channel to the North of the Pits measuring about 185 m x 2 m x 1.5 m D, running E-W, this is shown in Five Year Development Plan , Plate No 6. However this will be done only after gaining experience during the first Monsoon season after the commencement of mining operations.

The angle of dip is about 65 degrees. The development is provided to be done on hanging wall and foot wall side.

There are twelve numbers of old pits for Bedded ore.

The length, breadth & depth of the Pits is as under :

Pit No.	Lm	Bm	Dm	
1	6.50	4.00	1.10	Float ore pits
2	5.00	3.50	1.70	
3	16.00	7.00	2.30	
4	13.00	5.00	3.00	
5	25.00	7.00	2.50	Bed ore pits
6	6.00	4.00	0.50	
7	30.00	12.00	3.00	
8	57.00	6.00	3.30	
9	10.00	5.00	1.00	Float ore pits
10	12.00	4.00	1.50	
11	15.20	4.20	1.25	Bed ore pits
12	22.00	4.00	1.60	

(b) For Float Deposit :

There are already four depressions in the Float area which are marked in Geological and Surface Plan as Pit No's 1 ,2, 9 & 10. There is no more significance of these Pits.

For Float Ore working, the area still available is about 0.1325 H measuring about 315 m. length and 50 m. breadth after leaving an area of 50 m. x 50 m. as worked out area.

1) Since Float ore is found to occur immediately on the Hanging wall side of the ore body, no separate operations for removal & rehandling of overburden are required as these operations are covered under mining of Bedded Deposit. Soil and waste are shifted to the dumping sites as provided for in Plate No 6. tes and to be back-filled in the pits.

2) Mining of Manganese ore manually.

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3) Removal of mined ROM to surface yard for proper breaking, sizing, sorting, stacking & zigging etc. Flow sheet is enclosed as Annexure No. 5.

4) Preparing grade-wise stacks of ore for delivery.

5) Dewatering of the working pits is not required.

6) During proposed mining for five years, about 80 to 100 trees are likely to be cut.

The Proved & Probable category reserves of Bedded Ore and Float Ore together are 19300.00 T & can support the Production of about 1000 T per year during the working of twenty years of the Lease period as applied for by the Applicant.

पत्र संख्या क्रमांक VIDE LETTER NO BGT/mn/mPLN-357/NGP dated 9.5.94

4.1 YEARWISE DEVELOPMENT FOR THE FIRST 5 YEARS

On the basis of experience of mining in the area and cross-sections, etc, the development inclusive of rehandling of dumps is as under :

Years	Development for Bedded Ore & Float Ore Cu m	Total Cu.m.
1994-95	1915.20	1915.20
95-96	1915.20	1915.20
96-97	2377.43	2377.43
97-98	5741.77	5741.77
98-99	5741.77	5741.77
	Total :	17691.37

Because of 60 degrees and more angle of dip, development on hanging-wall as well as foot-wall side is considered.

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4.2 Yearwise-Production on the basis of year wise development and sections, the production anticipated is as under :

Year	Graded Production from Bedded Deposit T(75% of R.O.M)	Float Deposit T(25 % of R.O.M.)	Total T
1994-95	500		
95-96	500	50.00	550
96-97	700	50.00	550
97-98	900	62.16	762.16
98-99	900	151.07	1051.07
		151.07	1051.07
Total :	3500	464.32	3964.32

(75 % Graded Production and 5 % Sub-Grade and 20 % mineralised rejects of R.O.M in respect of Bedded deposit, 25 % Graded Production and 5 % sub-Grade and 70 % mineralised rejects in respect of Float deposit).

Details of 5 years development & production are given in Annexure no 6. Conceptual Plan based on the life of mine is enclosed as Plate 7.

4.3 Proposed rate of production when the mine is fully developed:

It will be 1000 Tonnes per year of saleable ore (900 T from Bedded deposit + 100 T from Float deposit) with 1600 T of ROM (1200 T for Bedded deposit and 400 T for Float deposit) and 5741.77 Cu.m. of Overburden.

4.4 Proposed method of Mining :

The proposed method of mining is by open cast.

4.4. 1 Open cast working :

The details are given in the Five year Development Plan enclosed as Plate no 6, prepared, on scale of 1:1000 where as sections are drawn on scale 1:500, Plate No. 6 A. The bench height will be 1.5 metres. The width of the bench will be 1.5 metres and the final slope on all sides of the pit will be 45 degrees. Seven benches in overburden of about 1.5 m each and Nine benches in mica schists will always be maintained. The benches in overburden & soft micaceous schist will be worked simultaneously. The details of the benches, for proposed 5 year working are as under :-

End of Year	Number of Benches Hanging wall	Foot wall
1 st		
2 nd	6	4
3 rd	6	4
4 th	6	4
5 th	6	4
	6	4

During Conceptual period Hanging wall will have 10 Benches and Foot wall will have 7 Benches.

These benches are shown in Five Year Development Plan enclosed as Plate NO 6.

The Proved Category of Reserves estimated at about 18300.00 Tonnes, are adequate to ensure to meet the designed production of Manganese ore for twenty years.

4.5 .1 Extent of manual mining :

Mining is exclusively mannual and the hard formations will be fragmented by blasting .

4.5 .2 Drilling :

The drilling will be done by Jack-hammers.
Other details are as follows :

Depth of hole	700 mm
Dia of Hole	34 mm
Burden	700 mm
Spacing of holes	Upto 1400 mm

To meet the designed production of about 1000 Tonnes(900 T from Bedded deposit and 100 Tonnes from Float deposit) of saleable Manganese ore (with an ROM of 1200 T), it is required to drill about 112 holes per month. Thus the total drilling for ore will be 78.4 m per month. Equal amount of drilling with the same parameters will be required for developmental work.

To suppress dust arising out of drilling, wet drilling method will be adopted.

4.5 .3 Loading :

Pit head loading of ore is done on contract basis, after the material is shifted to surface storage yard, manually.

4.5 .4 Hauling/Transport :

The ore is transported by trucks to the buyers's destination, on contract basis.

4.5 .5 Miscellaneous operations :

After ore is brought to the storage yard, proper stacks for sampling are prepared & subsequently ore is delivered. All these operations are manual (stacking by departmental workers & loading on contract basis).

5.0 BLASTING

Regarding the precautions & measures of safety to be taken at the time of blasting, as stipulated in Metalliferous Mines Regulations 1961, will be strictly adhered to. In addition to this the villagers/local people will be suitably advised to take shelter in safe places at the time of blasting. In addition wet-drilling, that will supress the

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During Conceptual period Hanging wall will have 10 Benches and Foot wall will have 7 Benches.

These benches are shown in Five Year Development Plan enclosed as Plate NO 6.

The Proved Category of Reserves estimated at about 19300.00 Tonnes, are adequate to ensure to meet the designed production of Manganese ore for twenty years.

4.5 .1 Extent of manual mining :

Mining is exclusively mannual and the hard formations will be fragmented by blasting .

4.5 .2 Drilling :

The drilling will be done by Jack-hammers. Other details are as follows :

Depth of hole	700 mm
Dia of Hole	34 mm
Burden	700 mm
Spacing of holes	Upto 1400 mm

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To meet the designed production of about 1000 Tonnes(900 T from Bedded deposit and 100 Tonnes from Float deposit) of saleable Manganese ore (with an ROM of 1200 T), it is required to drill about 112 holes per month. Thus the total drilling for ore will be 78.4 m per month. Equal amount of drilling with the same parameters will be required for developmental work.

To suppress dust arising out of drilling, wet drilling method will be adopted.

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Pit head loading of ore is done on contract basis, after the material is shifted to surface storage yard, manually.

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5.0 BLASTING

Regarding the precautions & measures of safety to be taken at the time of blasting, as stipulated in Metalliferous Mines Regulations 1961, will be strictly adhered to. In addition to this the villagers/local people will be suitably advised to take shelter in safe places at the time of blasting. In addition wet-drilling, that will supress the

dust generated during drilling and muffled blasting will be practiced. Balsting parameters are being finalised by experimenting and will be implemented in consultation with concerned Statutory Authorities.

The drilling and blasting operations are required for production of Manganese ore from Bedded deposit only.

5.1 Broad Blasting Parameters:

The drilled holes as described in 4.5 .2 will be blasted using the following :-

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Ordinary fuse	Per hole	
Charge per hole	1200 mm	1 stick of gelatine(80 to 90%) of 200 mm
Ordinary detonator	1 no	

The above parameters will yield about 0.30 cu.m. of Manganese ore (ROM) per hole blasted.

One Kg of Gelatine (7 sticks) will produce 2.1 Tonnes of (R.O.M.) Manganese ore.

5.2 Type of explosives to be used :

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a) For production of ore.

Gelatine with ordinary detonator & fuse is used. The total annual requirement of explosives, fuse and detonators, as the mine is fully developed to produce ROM of 1200 Tonnes.

Production R.O.M	1200.0 T
Volume	400.0 cu m
Volume/blast	0.30 cu m
Number of holes	1333.33 or say 1334
Gelatine(7 sticks/kg)	1334 nos of Sticks (190.57 kgs)
Detonators	1334 nos
Fuse 1.2 m/hole	1600.8 m

The number of holes blasted every month is 112. Not more than 50 holes will be blasted in a day.

b) For development,

It is observed that below 1 m from surface, Mica Schists formation is hard enough requiring blasting operations. Hence, the amount of explosives, detonators, & Fuse coils etc will be additionally the same as above.

5.3 Storage of Explosives :

The Applicant will have a suitable magazine to store explosives. And the same will be situated in this area.

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6.0 MINE DRAINAGE :

It is reported that there is no underground seepage in the pits either for Bedded Ore or for Float Ore. During monsoon season, the accumulation of surface water will be about say 8,000 liters. This will be pumped out with two 5 HP diesel and one 5 HP electric pumps with 75 mm and 60 mm suction and delivery pipe @ 500 litres/minute with a total head of less than 25 meters.

Pumped out water takes its own course & flows out in the South & West.

The details of annual rainfall for the last 5 years are given in Chapter 12.2. ii , titled "Water Regime".

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7.0 DISPOSAL OF WASTE

7.1 Nature of Waste :

The waste produced during mining operations consists of overburden & excavated country rocks & Gondite from bed ore.

7.2 Selection of dumping site :

The volume of the existing dumps in the area based on the cross-sectional area of the dumps, is

Dump No	L m		B m		H m		Cu m
D-1	18	x	11	x	1.20	=	237.6
D-2	110	x	10	x	2.74	=	3014
D-3	15	x	8	x	2	=	240
D-4	20	x	11	x	1.10	=	242
D-5	19	x	9	x	1	=	171
D-6	17	x	10	x	0.25	=	42.5
					Total :	=	3947.1 cu m

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These dumps are spread over an area of about 4600 Sq. m. with a height of upto 3 m.

These dumps are marked on Surface Plan, Plate 5.

The dumps proposed to be produced during 5 years, after grant of lease will be 17691.37 Cu.m. & till the end of 10 years period it will be 70765.48 Cu.m.

It is also provided that the total volume of dumps produced will be put on the non-mineralised area Southern portion of Pit No. 1. The retrieving method of dumping will be adopted. This area is marked in Five year Development Plan, Plate No 6.

The detailed calculations of production, development & rehandling of dumps are given in Annexure No. 6.

7.3 Maximum Height & Spread of Dumps :

As mentioned earlier, during 5 years the excavation of overburden is expected to be 17691.37 Cu.m. This will be spread over an area of about 5895.00 Sq.m. with a maximum height of 3 meters. For the excavation of overburden during the balance period of Lease, in Conceptual Plan, the excavation will be about 70765.46 Cu.m. This will spread over an area of about 23588 Sq.m. with a maximum height of 3 meters.

The stabilization will be done by means of pitching of material raised from the mines upto a height of 2 m from ground level and by planting adequate no of trees and by growing grass on the dump-slopes. Sections along proposed dumps are shown on Conceptual Plan - Plate No 7.

7.4 Stacking Of Subgrade Minerals

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The subgrade ore will be stacked on the site as shown in Plate 6. As & when required subgrade ore will be used for blending. Hence by the end of Lease period, there will not be any stock of sub-grade material on the mines. The height of Subgrade dump will not be more than 2 m.

7.5 Selection of site for stacking :

The ore is stacked in place provided for & shown in Plate no 6. This is in non-mineralised ground.

7.6 Height and spread of Stacks :

The stacks of ore may be 10 m x 6 m x 1 m.

8.0 USE OF MINERAL :

8.1 If for captive use, the location of the plant and distance from the mine :

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Not Applicable

8.2 If intended for sale - Industry in India or abroad for whom intended :

The production of ore from this area will be sold to the buyers who are ferro producers & others for metallurgical purposes, on the basis of the chemical composition of the ore, after suitable blending. A list of manganese ore buyers is as follows:-

1. M/s Ferro Alloys Corporation Limited, Garivdi (A.P)
2. M/s Uniferro International Limited, Tumsar (Maharashtra).
3. M/s Union Carbides India Limited, Bombay.
4. M/s Bhilai Steel Plant, Bhilai (M.P)

The Manganese ore upto a grade of 38% is supplied to Ferro Manganese producers, where as manganese ore of + 28% Mn content is supplied to Bhilai Steel Plant.

S. V. Gilhall

9.0 SURFACE TRANSPORT

9.1 Mode of Transport of mineral to the despatch point:

The mineral produced shall be transported manually to storage yard on mines and shown in Plate 6. This is the final despatch point.

10.0 SITE SERVICES :

The site services to be provided at the Mines are

1. Office
2. Stores Shed
3. Room for First aid.
4. Rest Shelter
5. Surface Latrines.
6. Blasters' Sheds (2 no's)

All these are shown in Five-Year Development Plan, Plate No 6.

11.0 EMPLOYMENT POTENTIAL

11.1 Management and Supervisory personnel :

The staff as under, will be engaged before the commencement of mining operations.

1 No.	Permit Manager	
1 No.	Mate	
1 No.	Supervisor	
1 No.	Blaster	
1 No.	Part-time Mining Engineer	- as per Rule 42 of MCDR 1988

11.2 Labour - Skilled , Semi-skilled , Unskilled :

The labour strength, as below, is required when the mine will be fully developed to produce 1,000 T per annum (900 T from Bedded Deposit and 100 T from Float Deposit).

Skilled workers	... 4 nos.
Unskilled workers	... about 150 nos.

Out of unskilled labour force about 100 workers are required for mining of ore & balance for development & other jobs such as hauling, rehandling, shifting and sorting , screening, stacking when-ever required.

For Production of Manganese ore from Bedded deposit, it will be with O.M.S. of 0.06 from mine (Or 1.5 T per labour per month) and for production of Float ore deposit, it will be 0.04 (Or 1.0 T per labour per month). This is reported by the Lessee.

12.0 ENVIRONMENTAL MANAGEMENT PLAN

12.1 Base Line information :

The inhabitants of near by villages are engaged in seasonal agriculture & remain unemployed for rest of the year.

ii) Existing Land Use Pattern :

The exisiting land use pattern , in Sq.m. is as under :-

	Present Sq. m.
a) Area under pits	1394
b) Area under dumps	1979
c) Area under roads & structures etc	1350
d) Area for storage	Nil
e) Area under Plantation	Nil

There is Government forest all around the area.

Three sheets of photographs of Pit No 1 & other features will be included in the Modified Mining Plan.

ii)Water regime :

The water table is found to be 4 meters from surface (346 MRL) during mansoon period. It recedes to a level of 12/13 meters from surface during dry months. This information was collected from local people.

The annual rainfall in the area is about 1600 to 1800 mm. The annual rainfall & temperature variations for the last 5 years are as under :

Year	Rainfall mm	Temperature degrees C min	max
1992	2156	9.6	46.50
1991	2081	10.5	47.0
1990	1760	11.0	47.0
1989	1850	9.0	47.5
1988	1927	10.0	45.2

This information is collected from Tahsildar's office, Katangi. There is no regular drainage pattern in the area. The water flows out naturally along slope, towards South.

iii) Human Settlements :-

Locations of villages within five kms of the area are as under:

Village	Distance kms	Population	Direction
1) Chatera	5.0	1500	S-W
2) Pulputta	4.5	1200	S-W
3) Kapurbihini	3.0	300	W
4) Jaitpur Khapa	5.0	125	N-E
5) Tuiyapar	2.5	800	S
6) Pandharwani	2.0	950	N-E
7) Mohagaonghat	3.0	850	N-E
8) Hatora	4.5	1000	N-W
9) Pindkepar	3.0	1000	S-E

C V. Kelkar

PHOTOGRAPHS OF PITS, ETC IN MOHAGAONGHAT MANGANESE ORE AREA OF ARYAN FERRO ALLOYS, BALAGHAT

Pit No's-1 & 2

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Pit No's 3 & 4

Pit No 5

PHOTOGRAPHS

Pit NO 6

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Pit NO 7

Pit NO 8

Pit No's 9 & 10

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Coal

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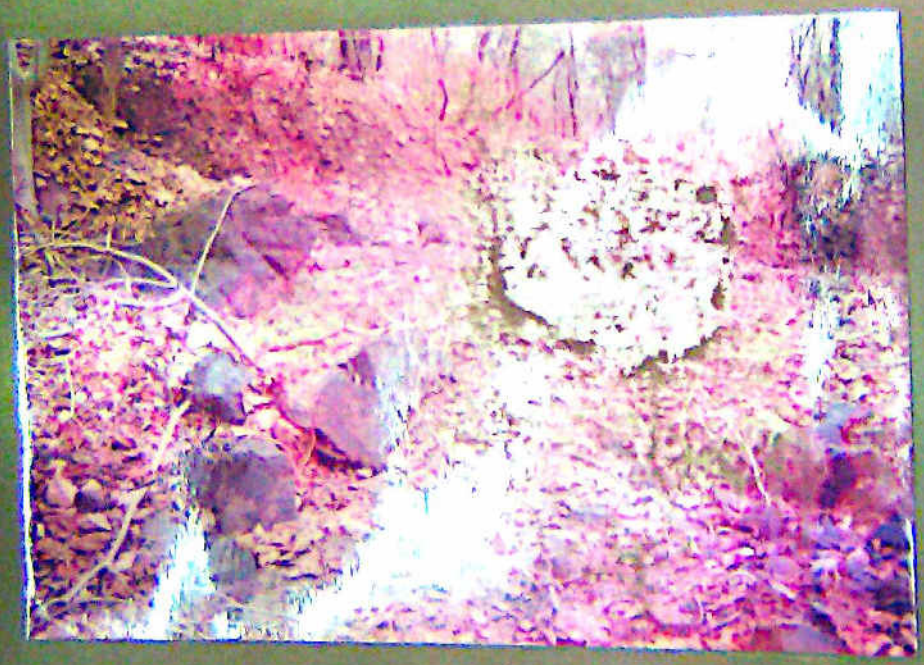

Pit No 11

Pit No 12

The details are collected from local Patwari. All these villages are marked in Plate no 2, Key Plan (Location plan).

iv) Public building, places and monuments:

There are no public buildings, monuments etc, near about the area.

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v) Quality of air & water:

Water available in open well in the area is potable and it is pure and clean. The air is clean and not polluted as there is no industry. Predominant wind direction is North - East & South - West.

vi) Number & types of trees :

There are 627 trees in the area. The types of trees are as under :

Mahua trees	9 nos	Karli trees	75 nos
Neem trees	35 nos	Bheria trees	50 nos
Babul trees	50 nos	Hardul trees	65 nos
Palsa trees	110 nos	Others	68 nos
Kosum trees	10 nos		
Tendu trees	135 nos		

500 nos

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12.2 Environmental Impact Assessment :

a) Land Scape : Leaving the area covered by pits and dumps, the rest of the area is with uneven landscape due to earlier scattered workings of float ore deposit of Manganese Ore.

b) Aesthetic environment : There is nothing special about the aesthetic environment in the concerned area.

c) Soil & Land use pattern : Soil is described in 3.2 in Local Geology, Land Use Pattern is given in Plate No. 1 A.

d) Agriculture : The entire area is not suitable for agriculture.

e) Forest : Other than the Government Revenue Land proposed to be granted under the Mining Lease, mostly there is forest around the area.

f) Vegetation : Already mentioned in 12.1 (vi).

g) Public building, places and monuments : Already mentioned in 12.1 (iv).

12.2 (i) Impact of mining and beneficiation on environment:-

The area likely to be affected, for proposed working for the life of the mine, is as under :-

		End of 5 th Year Sq. m.	Conceptual Period in Sq. m.
a)	Area under Pits	2775	15750
b)	Area for dumping	5697	23588
c)	Area for storage	163	652.34
d)	Area for roads, structures, etc	1500	1500
e)	Area under Plantation (50 trees per year)	2500	16000

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The figures in "Conceptual column" above, are sum total of present (as mentioned in 12.1) and proposed activities by the end of 5 years and end of Lease period of 20 years.

During mining activities, the following operations are required :

1) Drilling & Blasting by compressor and explosives

2) Breaking and sizing of fragmented Manganese Ore and country rocks.

3) Transportation by trucks.

Dumping will be carried out in the space provided and shown in Plate no 6.

There are no chemical beneficiation processes involved.

The dewatering operations will be carried out without affecting water regime or drainage pattern. The same operations will be carried out without any effect on environment.

The new dumps are proposed to be created on non-mineralised ground. Arrangements such as pitching, terracing will be done, wherever required.

Flora and Fauna will not be affected, as about 200 trees in respect of Bedded Deposit and Float ore Deposit are required to be cut for the proposed mining operations

The machinery required does not produce any harmful effects such as noise, vibrations, pollution etc. Hence quality of air will not be affected.

Wet drilling method will be adopted for dust suppression. The quantity of Manganese ore to be transported by trucks is about 1000 Tonnes/year that is about 5 to 10 truck loads every month. This will have no adverse impact.

Blasting operations are on a small scale (530 holes per month). This will not produce any harmful vibrations.

All points mentioned in Circular No. 3/93 dt. 17.9.91 are covered in Chapter 12.1 & 12.2.

12.3 Environment Management Plan :

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i) Temporary Storage and preservation of top soil :-

There is no top soil in the area.

ii) Proposal for reclamation of land affected by mining activities during at the end of mining :

At the end of 5 years and end of Lease period, the dimensions of the Pit will be as under :-

End of 5 th yr

165 Lm x 15 Bm x 6 Dm (344 MRL)

End of 10th year

315 Lm x 50 Bm x 14m D (338 MRL)

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At this stage, it is difficult to visualise reclamation of area covered under Pits. This aspect will be considered after the results of proposed exploration, in regard to the depth of continuity of ore body & the size of the Pits, etc.

iii) Programme of Afforestation :

The Lessee has already covered an area of 19500 Sq. m. for plantation purposes, wherein teak & other plants are growing. The plant are being maintained & due care is being taken for their survival. The areas for plantation are shown in Plate No. 5. Areas for proposed plantation are shown in Plate No's 6 & 7.

About 50 trees per year will be planted in the area as shown in Plate No 6 & 7. In addition to the place provided for afforestation in Plates No 6 & 7, it is proposed to use existing dumps beyond the ultimate pit area for plantation purpose which will be undertaken simultaneously with mining operations. Additional 50 trees per year will be planted on the dumps.

Photographs of Plantations are enclosed as stated in 12.1 (i).

iv) Stabilization and vegetation of dumps :

The area as shown in Plate No. 6 & 7 will be used for plantation, in addition to the area provided for 7.5 m zone, as mining limit and also on old dumps. About 50 trees will be planted every year till the life of the mine, beginning from the monsoon in first year of the grant of Mining Lease.

v) Treatment and disposal of water from mine :

The question does not arise as there are no chemical beneficiation processes involved. The pumped out water which is experienced to be not harmful to the

E.V. Ambhore

agriculture and such other uses.

vi) Measures for minimising adverse effects on water regime:

As described earlier, water regime will not be affected.

vii) Socio-economic benefits arising out of Mining :

Local people will get job opportunities during Mining Operations.

13.0 ANY OTHER RELEAVANT INFORMATION :

13.1 Conceptual plan :

A Conceptual Plan with Sections is enclosed as Plate no 7 & Sections thereof as Plate No. 7 A. It is prepared on the basis of the mining operations proposed to be carried out in the area upto the end of lease period.

13.2 Conclusion :

From the above, it will be observed that during the working of the mines, no harmful effects on environment or ecology are likely to occuur. The working will offer employment to the local people.

पत्र संख्या दिनांक
VIDE LETTER No. BGT/MN/MPLN-357/NGP dated 9.5.94

CERTIFICATE OF CORRECTNESS

1. Certified that the provisions of Mines Act, Rules and Regulations made there under will been observed in the Mining Plan and wherever specific permissions are required, the applicant will approach the D.G.M.S.

2. It is also certified that the information furnished in the above Mining Plan is true and correct to the best of my knowledge.

Place : Nagpur Signature : S. V. Gokhale

Date : 4th May, 1994 Name : S. V. GOKHALE

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9/5/94

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Indian Bureau of Mines, Nagpur.

ANN - 1

मध्यप्रदेश शासन,
खनिज साधन विभाग

क्रमांक 2-99/93/12/2,

भोपाल, दिनांक,

प्रति,

मेसर्स अर्पण फेरो अलायस,
कातमी, जिला बालाघाट,
मध्यप्रदेश।

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विषय:- जिला बालाघाट के ग्राम मोहगांवघाट के रकबा 69.22 एकड़ क्षेत्र पर मैगनीज खनिज का खनिपट्टा स्वीकृत करने बाबत आवेदन पत्र।

Cawl

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Indian Bureau Of Mines, Nagpur

आपके द्वारा प्रस्तुत आवेदन पत्र दिनांक 24.6.92 से आपको सूचित किया जाता है कि आपके पक्ष में जिला बालाघाट के ग्राम मोहगांवघाट के रकबा 69.22 एकड़ क्षेत्र पर मैगनीज खनिपट्टा स्वीकृत करने हेतु भारत सरकार के पत्र दिनांक 16.11.93 द्वारा प्राप्त हुई हैं।

अतः आप केन्द्र शासन से अनुमादित मायनिंग प्लान 6: माह के भीतर प्रस्तुत करें ताकि प्रकरण में अगली कार्यवाही की जा सके। अन्यथा आपका आवेदन निरस्त किया जावेगा।

(एन0के0दहाड़े)
अवर सचिव
मध्यप्रदेश शासन, खनिज साधन विभाग.

पृ0क्रमांक 2-99/92/12/2, भोपाल, दिनांक,

प्रतिलिपि:-कलेक्टर बालाघाट की ओर उनके ज्ञापन क्रमांक 536/60 निO टीक/1/93 दिनांक 13.1.93 के संदर्भ में सूचनार्थ अग्रेषित।

अवर सचिव
मध्यप्रदेश शासन, खनिज साधन विभाग

ANN-2

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Indian Bureau Of Mines, Nagpur.

ANNEXURE NO.

Detailed Calculations of Reserves in Proved, Probable & Possible Categories in Mohagaonghat Manganese ore area of Arpan Ferro Alloys (Prop. : Smt. Hemlata Chaturvedhi), Balaghat.

(A)
Calculations of Reserves in Proved Category of Manganese ore, from floor of the pits upto 344 MRL.

Sr. No.	Pit No.	Depth From (MRL)	To	Inclined Depth of ore m	Length of pit m	Thickness m	Volume Cu. m	B.D. T/Cu. m	Tonnage
1	3 : 4 : 5 :	349.1	344	5.60	60	2	672	3	2016.0
2	6 : 7 :	350	344	6.62	47	2	622.28	3	1866.84
3	50 %Area of Influence ****	352	344	8.82	50	2	882	3	2646.0
4	8	348.1	344	5.6	57	2	638.4	3	1915.2
5	50 % of area of influence on both sides ****	352	344	8.82	57	2	1005.48	3	3016.44
6	11 : 12 :	350.2	344	6.84	35	2	478.8	3	1436.4
7	Area of influence upto Eastern Lease Boundary	352	344	8.82	9	2	158.76	3	476.28
							Total		13373.16

**** For unworked area in between the pits.

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Indian Bureau Of Mines, Nagpur

Contd. on Page 2

(B) Calculations of Reserves in Probable Category of Manganese ore in Bedded deposit, over entire strike length from Eastern to Western boundary from 344 to 338 MRL

8	Total length 344 from E to W	338	6.62	315	2	4170.6	3	12511.8

(C) Calculations of Reserves in Possible Category of Manganese ore in Bedded form for entire strike length from Eastern to Western boundary, from 338 to 334 MRL.

9	Total length 338 from E to W	334	4.4	315	2	2772	3	8316.0

(B 1) Calculations of Reserves in Probable Category of Manganese ore on Float deposit.

	Mineralised area in Sq. m.	Thickness of Float Ore Zone m.	Volume Cu. m.	B.D. T/Cu. m	Tonnage
9	13250	0.4	5300	2.5	13250.0

Recovery of Graded ore at 25 % = 3312.5

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Summary :

1. Proved Category, Bedded deposit - 13373.16 T
2. Probable Category, Bedded deposit - 12511.80 T
3. Probable Category, Float deposit - 3312.50 T
4. Possible Category, Bedded deposit - 8316.60 T

Total 37514.06 T

Contd. on Page 3

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Indian Bureau Of Mines, Nagpur

Assumptions for Bedded deposit :

(1) Continuity of ore body in Depth - upto 334 MRL, below about thin overburden from surface, on the basis of the Pits in the surrounding area.
(2) Average thickness of ore body of 2 m. as reported.
(3) Average angle of dip taken to be 65 degrees to work out inclined length of ore body.
(4) Bulk Density of 3.0 T/Cu. M. is considered.

Assumptions for Float deposit :

(1) Continuity of occurrence of Float deposit on the basis of survey.
(2) Recovery of 25 % of marketable ore on the basis of experience.
(3) Bulk density of 2.5 T/Cu. m. is considered.

S. V. Gokhale

(S. V. GOKHALE)

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Regional Controller of Mine (N R.)
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Indian Bureau Of Mines, Nagpur

ANN-4

①

Premier Analytical Laboratories

CONSULTING & ANALYTICAL CHEMISTS
SAMPLERS ASSAYERS OF MINERALS & ...
Veg-Oil, Ground Spices & Other Food Products
Approved by The Directorate of Marketing & Inspection
Govt. of India Nagpur AGMARK

BRANCH ...
Ganpat Galli
Sambalgi Building
BELGAUM

S. No. F/1726

Test Certificate

Date 14.12.1993

We hereby Certify that a sample of "MANGANESE ORE" submitted to us on 10.12.1993 by M/s Arpan Ferro Alloys (Prop- smt Hemalata Chaturmohata)

MARKED Test Sample No : 1

Area : Mohagaonghat Area

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SEALED Nil

SAMPLE NOT DRAWN BY PREMIER ANALYTICAL LABORATORY

has been analysed with following result

ANALYSIS ON SAMPLE DRIED ...

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Regional Controller of Mine (N.R.)
भारतीय खान ब्यूरो, नागपुर
Indian Bureau Of Mines, Nagpur

Manganese	... ...	Mn	42.50 %
Iron	... ...	Fe	5.20 %
Silica	... ...	SiO_2	13.76 %
Phosphorus	... ...	P	0.18 %
Alumina	... ...	Al_2O_3 ...	2.75 %

Partner.

Scanned by CamScanner

ANN-4 (2)

Ana labs

ANALYTICAL & CONSULTING CHEMISTS ENVIRONMENTAL ENGINEERS & CONSULTANTS

H.O : 3-6-671/1 Street No. 10, Himayatnagar, Hyderabad - 500 029

Nagpur Branch : 46, Abhyankar Nagar, Nagpur - 440 010.

Report No. 24/94 Date : 5/4/1994

Sample Description : Test Samples of Manganese Ore (Five in numbers) from Mohgaonghat Area of Arpan Ferro Alloys, Prop. Smt Hemlata Chaturmohta

Samples not drawn by us.

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Sr.No.	Sample No.	Date of Sampling	Mn%	Fe%	SiO_2%	P%
1)	1	3/4/94	41.76	5.7	12.76	0.19
2)	2	3/4/94	36.07	6.5	14.52	0.21
3)	3	3/4/94	29.67	8.2	20.61	0.25
4)	4	3/4/94	23.76	9.10	26.56	0.30
5)	5	3/4/94	17.52	11.52	35.06	0.38

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Regional Controller of Mine (N.R.)
भारतीय खान ब्यूरो, नागपुर
Indian Bureau Of Mines, Nagpur

Director
Ana Labs

ANNEXURE NO. 5

Detailed Calculations of Working for Five-Year Development Plan for Mohagaonghat Manganese Ore Area of Arpan Ferro Alloys, (Prop. : Smt. Hemlata Chaturmohta), Balaghat.

Working of Bed Ore

Year	ROM Cu. m.	ROM M.T.	Graded 75 % M.T.	Sub-Gr 5 % M.T.	M.R. 20 % M.T.	Development Cu. m.	Remarks
94-95	222.22	666.66	500	33.33	133.33	1915.20	
95-96	222.22	666.66	500	33.33	133.33	1915.20	B.D. 3 T/ Cu. m.
96-97	311.11	933.33	700	46.66	186.66	2377.43	
97-98	400.00	1200.00	900	60.00	240.00	5741.77	
98-99	400.00	1200.00	900	60.00	240.00	5741.77	
	1555.55	4666.65	3500	233.32	933.32	17691.37	

Working of Float Ore

Year	ROM Cu. m.	ROM M.T.	Graded 25 % M.T.	Sub-Gr 5 % M.T.	M.R. 70 % M.T.	Development Cu. m.	Remarks
94-95	80	200	50	10	140	---	
95-96	80	200	50	10	140	---	B.D. 2.5 T/ Cu. m.
96-97	99.50	248	62.18	12.43	174.12	---	
97-98	241.72	604.30	151.07	30.21	423.01	---	
98-99	241.72	604.30	151.07	30.21	423.01	---	
	742.94	1856.60	464.32	92.85	1300.14		

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Regional Controller of Mines (N.R.)
भारतीय खान ब्यूरो, नागपुर
Indian Bureau Of Mines, Nagpur.

Working for 5 Years

94-95 Cross-sectional area = 11.02 Sq. m.

ROM = $\frac{222.22}{11.02}$ = 20.16 m. length.

Float ore area from section = 4 Sq. m.
Therefore, 20.26 x 4 = 80.64 Cu. m.
Development:- Area = 99 Sq. m.
20.16 x 99 = 1995.84 Cu. m.
- 80.64 Cu. m.

1915.20 Cu. m.

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95-96 --do--

96-97 Cross-sectional area = 12.50 Sq. m.

ROM = $\frac{311.11}{12.50}$ = 24.88 m. length.

Float ore area from section = 4 Sq. m.
Therefore, 24.88 x 4 = 99.55 Cu. m.
Development :- 24.88 x 99 = 2476.93 Cu. m.
- 99.55 Cu. m.

2377.38 Cu. m.

Coal
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Regional Controller of Mine (NR)
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Indian Bureau Of Mines, Nagpur.

97-98 Sectional area = 15.44 Sq. m.

ROM = $\frac{933.33}{15.44}$ = 60.44 m. length

Float ore = Sectional area = 4 Sq. m.
Therefore, 60.44 x 4 = 241.79 Cu. m.
Development = Sectional area = 99 Sq. m.
Therefore, 60.44 x 99 = 5983.56 Cu. m.
- 241.79 Cu. m.

5741.77 Cu. m.

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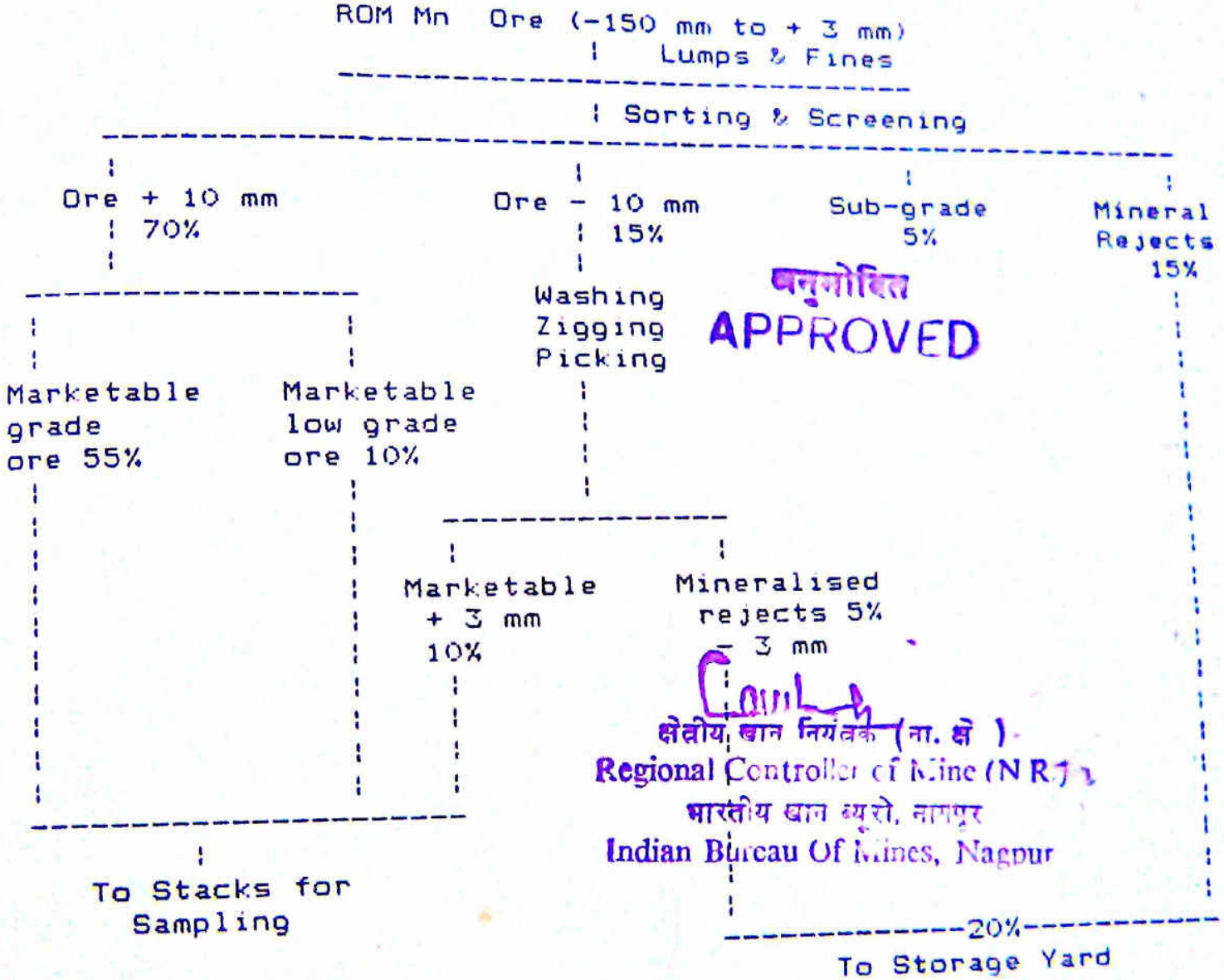
ANNEXURE NO.6

FLOW SHEET

For Manganese Ore recovery, rejection etc of Manganese Ore from Mohagaonghat Area of Arpan Ferro Alloys (Prop. : Smt. Hemlata Chaturmohta), Balaghat.



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Regional Controller of Mine (N.R.)
भारतीय खान ब्यूरो, नागपूर
Indian Bureau Of Mines, Nagpur

S.V. Gokhale

(S.V. GOKHALE)

Date : 10-4-94

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ANNEXURE NO 7.

C E R T I F I C A T E

This is to certify that the provisions of Mineral Conservation and Development Rules, 1988 have been observed in the Mining Plan of MOHAGAONGHAT Manganese Ore mine for an area of 21.02 Hectares in Balaghat District of Madhya Pradesh State of / applied by Arpan Ferro Alloys, Prop. Smt. Hemlata Chaturmohta, Kosmi, Gondia Road, Balaghat 481 001 (M.P.) and wherever specific permissions are required, the applicant will approach the concerned authorities of Indian Bureau of Mines for granting the permission.

(S.V. GOKHALE)

Signature of RQP

RQP No. RQP/NGP/002/87/A

NAGPUR

Date : April 10, 1994

क्षेत्रीय खान नियंत्रक (ना. क्षे)
Regional Controller of Mine (N R.)
भारतीय खान ब्यूरो, नागपूर
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