



SCHEME OF MINING

(PREPARED UNDER RULE 12 OF MCDR, 1988)

WITH PROGRESSIVE MINE CLOSURE PLAN

(Under Rule-23 B of MCDR 1988)

OF

ORAGHAT IRON & MANGANESE ORE MINE

NL AREA OVER 25.847 HECT OR 63.87ACRES FOR IRON AND MANGANESE
IN VILLAGE ORAGHAT UNDER KOIRA P. S. OF SUNDARGARH DISTRICT,
ODISHA.

(FOR THE PERIOD FROM 2013 - 14 TO 05.04.2018)

Status of Lease Area

Category	Forest land	Non-Forest Land	Date of lease execution	Date of lease Expiry
A-OIPM	5.888 Ha.	19.959 Ha.	04.04.1998	05.04.2018

Lessee

Sayed Abdul Halim

Prepared by

Chandrabhanu Das
RGP/ 885/052/2004/A

GEO CONSULTANTS PVT. LTD.
BHUBANESWAR

Sayed Abdul Halim

Mines Owner



CONSENT LETTER FROM APPLICANT

The scheme of Mining in respect of Oraghat Iron and Manganese Mine of Sayed Abdul Halim over an area of 25.847 Ha. or 63.87 acres in village Oraghat under Bonai sub-division of Sundergarh district, Odisha, has been prepared by Chandrabhanu Das, Consulting Geologist, Regn. No. RGP/BBS/052/2004/A. I request the Regional Controller of Mines, Indian Bureau of Mines, to make further correspondence regarding modified scheme of mining with the said recognised person on his following address.

Chandrabhanu Das, RGP
GEO CONSULTANTS PVT. LTD.
853, Gobind Prasad (Medical Lane)
Mahavir Nagar
(In front of Radhika Complex/Reliance Fresh)
Laxmisagar, Bhubaneswar-751006
Phone - 0674-2575702, 9437019019 (m)

I hereby undertake that the scheme of mining prepared by the said recognised person shall be deemed to have been made with my knowledge and consent and acceptable and binding on me in all respect.

Date: 15/07/19

Place: Badli

Signature of the Lessee

Sayed Abdul Halim
(Mine Owner)

Sayed Abdul Halim

Mines Owner



UNDERTAKING - I

I, hereby undertake that, all the measures proposed in the progressive mine closure plan chapter of the scheme of mining of Oraghat Iron and Manganese Mine of Sayed Abdul Halim over an area of 25.847 Ha. or 63.87 acres in village Oraghat under Bondal Sub - division of Sundargarh district, Odisha, will be implemented by me in a time bound manner, as has been proposed in the Progressive Mine Closure Plan.

Date: 14-01-14

Place: Bondal

Signature of the Lessee

Sayed Abdul Halim
(Mine Owner)

Sayed Abdul Halim

Mines Owner



UNDERTAKING-II

I hereby undertake that our Mining Lease area, with respect to Oraghat Iron and Manganese ML, village Oraghat under Bonai subdivision of Sundergarh district, Odisha, after reconciliation through DGPS survey by the State Govt, will be acceptable to me. I shall be held responsible for any discrepancy if noted after reconciliation of the lease area by the state govt and I will abide to all statutes, guidelines, and notifications governing the regulation of mines without any condition with respect to the DGPS Survey.

Date: 1st 4/14

Place: Bonai

Sayed Abdul Halim

Mine Owner

Sayed Abdul Halim

Mines Owner



CERTIFICATE

This is to certify that "The Provisions of Mines Act, Rules and Regulations made there under have been observed in the Scheme of Mining of Oraghat Iron and Manganese Mine over 25.847 Ha. or 63.87 acres belonging to Sayed Abdul Halim and where specific permissions are required, the lessee will approach the D.G.M.S. Further, standards prescribed by DGMS in respect of Mines Health will be strictly implemented".

Place: Bodbil

**Sayed Abdul Halim
(Mine Owner)**

Sayed Abdul Halim

Mines Owner



CERTIFICATE -I

Certified that the rules & regulations, orders made by the Central or State Government, Statutory Organizations, Court etc. have been taken into consideration. During preparation of Progressive Mine Closure Plan under rule 23 (B) of MCDR, 1988 by the RQP Chandrabhanu Das, Consulting Geologist, Regn. No. RQP/885/052/2004/A. of Geo Consultants Pvt. Ltd, B53, Gobind Prasad (Medical Lane) Mahavir Nagar (in front of Radhika Complex/Reliance fresh) Laxmibagar, Bhubaneswar-751006 in respect of Oraghat Iron and Manganese Mine over 25.847 Ha. or 63.87 acres belonging to Sayed Abdul Halim Wherever any specific permission is required the Lessee will approach the concerned authorities.

Date: 19-01-14

Place: Bhubli

Signature of the Lessee

Sayed Abdul Halim
(Mine Owner)



CERTIFICATE - II

This is to certify that the provisions of MCDR, 1988 and MCR, 1960 in respect of the Scheme of Mining of Oraghat Iron and Manganese Mine over 25.847 Ha. or 63.87 acres, in village Oraghat of Sundargarh district, Odisha, of Sayed Abdul Halim are strictly observed in the Scheme of Mining and wherever specific permissions are required, the applicant will approach the concerned authorities of Indian Bureau of Mines for granting the permission.

Date : 18.01.14
Place : Bhubaneswar


Chandrabhanu Das
RQP/ 885/052/2004/A



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LIST OF ANNEXURES

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VIIID	Suspension of mining by the Dy Dir of Mines, Koirā due to want of Consent to Establish and Consent to Operate on 26.11.11.
VIIIE	Letter of the Dy Dir of Mines, Koirā allowing mining operation on 19.02.2013
VIIIF	Copy of Violation Letter of IBM dated 29.11.11 & its compliance by the lessee. Copy of Violation Letter of IBM dated 24.10.13 & its compliance pending by the lessee.
IX	ID Proof & Address Proof (Permanent & Present)
X	Lease deed
XI	Baseline data
XII	Feasibility study report
XIII	Copy of Bank Guarantee



INTRODUCTION

The Lessee Sayed Abdul Halim had applied for the mining lease over 64.77 acres or 26.216 ha for the above said area. However, mining lease was granted over a reduced area of 25.847 Ha. or 63.87 acres.

The iron and manganese ore mining lease over an area of 25.847 ha. or 63.87 acres in village Oraghat in Barai Sub-Division of Sundargarh district of Odisha was executed in favour of the lessee, Sayed Abdul Halim by Government of Odisha on dt.04.06.1998 for a period of twenty years.

The total M.L. area of 25.847 ha. Comprises of PRF/DLC forest 5.888 ha. and 19.959 ha. of non forest. The lessee has applied for diversion of 5.8888 ha. of PRF/DLC forest land including 0.562 ha. PRF/DLC forest land has coming within safety zone which is under process.

Mining Plan was prepared and approved by the Regional Controller of Mines, Indian Bureau of Mines, Calcutta vide letter no. CAL/SG/Fe&Mn/MP-515 dated 18.09.1997, over the area of 26.216 Ha before the grant of the lease. As the mining plan was approved over an area of 26.216 Ha, the lessee had submitted the modification to the approved mining plan under Rule 10 of M.C.D.R, 1988 for the revised executed area of 25.847 ha or 63.87 acres and was approved vide letter no-MP/OTF/MECH/21-ORI/BHU/2008-09 dt. 18.12.2008. Then the scheme of mining was prepared for the year 2008-09 to 2012-13 under rule 12 of MCDR 1988. The said scheme of mining was approved by IBM Bhubaneswar vide letter no-MS/OTFMECH/26-ORI/BHU/2008-09 dt.29.12.2008. A task force of Indian Bureau of Mines inspected the mine on 25.08.2010 and ordered suspension of mining activities under Rule 13 (i) of the MCDR, 1988.

APPROVED
24/11/19

In compliance to the violation the lessee again submitted the modification to the approved scheme of mining under Rule 10 of M.C.D.R, 1988. Violation of the provisions of IBM had been attended in the modification to the approved scheme of mining and the modification to the approved scheme of mining was approved by IBM Bhubaneswar vide letter no-MSM/OTFMECH/61-ORI/BHU/2010-11 dt.07.03.11.

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RQ/IBBS/522004/A



of the approved scheme of mining is up to 31.03.2013. So to fulfil the statutory requirement of BM the present scheme of mining is being prepared now for the period 213-14 to 2017-18 (05.04.2018)

The lessee Sayed Abdul Halim, is a private individual, having his office at Barbil, Keonjhar, Odisha and deals with the production and marketing of minerals like iron, manganese etc. exploited from his mines. The present Mining Scheme deals with Oraghat Iron & Manganese mine spread over an area of 25.847 ha or 63.87 acres. The lessee has another mining lease excepting this mining lease details of which is mentioned in the following table:

Sl No	Lease reference no. & date	Area	Postal address	Type of mineral	Remarks
1	Mn Ore Mines, Oraghat, ML No 7088/SM dated 18.09.2007	11.247Ha	Oraghat, Sundargarh	Manganese	Temporarily closed due to want of EC.

The mine has been closed temporarily by the DFO, Barbil from 17th February 2010 due to want of Environment clearance.

Status of various statutory clearances from different authorities is furnished below.

EC: Approved for 5 years (Ref: SEIAA/217/ENV Dt 16.04.2011) copy enclosed vide Annexure III.

Consent to operate: Granted vide letter No 743/IND-I-COH-5671 Dt.24.04.2013. Copy enclosed vide Annexure IV.

FC: The forest diversion proposal of above mine is under Process at office of D.F.O Barbil, in Sundargarh dist. Copy enclosed vide Annexure V.



Surface right: SR over 3.38 Ac, 1.63 Ac & 4.52 Ac, have been granted on dated 23.09.1998, 10.06.2008 & 06.01.2009 by the Mining Officer. Copy enclosed as Annexure VI.

The proposed scheme of mining has been envisaged to produce about 72000 tonnes of iron ore per annum.

CHAPTER – I



1.0 REVIEW OF MINING PLAN

1.1 NAME OF MINE

Oraghat iron and manganese mine
Village-Oraghat
P.S.-kolra
Sub-Division- Bondal
Dist- Sundergarh
State - Odisha

1.2 PARTICULAR OF APPROVAL OF MINING PLAN

Mining Plan was prepared and approved by the Regional Controller of Mines, Indian Bureau of Mines, Calcutta vide letter no. CAL/SG/Fe&Mn/MP-515 dated 18.09.1997, over the area of 26.216 Ha before the grant of the lease. As the mining plan was approved over an area of 26.216 Ha, the lessee had submitted the modification to the approved mining plan under Rule 10 of M.C.D.R, 1988 for the revised executed area of 25.847 ha or 63.87 acres and was approved vide letter no-MP/OTF/MECH/21-ORI/BHU/2008-09 dt. 18.12.2008. Then the scheme of mining was prepared for the year 2008-09 to 2012-13 under rule 12 of MCDR 1988. The said scheme of mining was approved by IBM Bhubaneswar vide letter no-MS/OTFMECH/26-ORI/BHU/2008-09 dt.29.12.2008. The task force of Indian Bureau of Mines inspected the mine on 25.08.2010 and ordered suspension of mining activities under Rule 13 (1) of the MCDR, 1988.

In compliance to the violation the lessee again submitted the modification to the approved scheme of mining under Rule 10 of M.C.D.R. 1988. Violations of the task force of IBM had been attended in the modification to the approved scheme of mining and the modification to the approved scheme of mining was approved by IBM Bhubaneswar vide letter no-MSM/OTFMECH/61-ORI/BHU/2010-11 dt.07.03.11. The validity of the approved scheme of mining is up to 31.03.2013.

1.3 DATE OF COMENCEMENT OF MINING OPERATION:

The date of commencement of mining operation is 02.01.1999.



1.4 a) DEFICIENCIES, IF ANY, THAT EXISTED IN THE APPROVED MINING SCHEME TO BE TAKEN NOTE OF AND RECTIFIED BY INCORPORATING SUITABLE PROPOSALS FOR IMPLEMENTATION IN THE SCHEME OF MINING :- No

b) REVIEW OF COMPLIANCE POSITION OF SALIENT FEATURES OF THE MINING PLAN AND CONDITIONS IMPOSED, IF ANY. During the tenure of the last scheme period the mine has been closed on 15.02.2010 as per the instruction of the DFO, Bondi, due to violation as per Para 4.4 of Guideline issued by MoEF, Govt. of India, as working in non-forest land violates FC Act 1980 (Annexure VII). The mine was temporarily closed, when IBM suspended mining operation on 25.08.2010 under Rule 13 (2) of MCDR 1988(Annexure VIIA). Then the lessee submitted the modification to the approved scheme of mining and the suspension order was revoked by IBM on 11.03.11(Annexure VIIIB). Then the Dy Dir of Mines, Koirā permitted mining operation on 15.10.2011(Annexure VIIC). Again the operation was suspended by the Dy Dir of Mines, Koirā on 26.11.11 due to want of Consent to Establish and Consent to Operate(Annexure VIID). After obtaining the Consent to Operate, the Dy Dir of Mines, Koirā allowed mining operation on 19.02.2013(Annexure VIIE). However, again the mine was suspended from 01.04.2013 due to want of approved scheme of mining. . No special condition has been imposed while approving the Mining plan. The review is as under.

(A) EXPLORATION

A total of 28 nos. of bore holes till the end of mineralisation zone was proposed in the approved scheme of mining to explore the area. However, due to non-clearance of forest land only 15 numbers of non-core holes have been completed in 2010-11. Therefore, it was again proposed to complete the exploration programme as was mentioned in the modification to the approved scheme of mining in addition to the already drilled holes in the modification to the approved scheme of mining.



II) Vibration and noise:

It was proposed that as the scale of mining activities would be small, the noise generation due to mining and handling of material would be minimum and would have no adverse effect on the surrounding environment. Still it was suggested that noise generation would be minimized by proper control measures.

Since the scale of mining operation was much less in comparison to the proposed mining plan the quantum of noise generation was very less.

III) Effect on Air and Water:

No noticeable adverse impact has been observed in case of air and water - both underground and surface. In fact atmospheric fresh air is available within the area today.

IV) Reclamation:

It was suggested in the approved modification of the scheme of mining to backfill the quarry existing in the southern part of the lease area as it is situated within the safety zone of the transmission line. However, it has not been accomplished because the potential of that part is not explored till date. Therefore, boreholes have been proposed over this part in the present scheme of mining. If it comes to be potential then the lessee would seek permission from appropriate authorities to divert the existing transmission line to mine out the area.

c) REVIEW OF COMPLIANCE POSITION OF CONDITIONS AND STIPULATIONS IMPOSED, IF ANY: -

Review of compliance of the conditions imposed during approval of the modification to the approved scheme of mining is as below:


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Sl No of condition of the approved letter	Conditions	Compliance	
xii	An yearly report before 1 st July of every year setting forth the extent of protective and rehabilitative works carried out as envisaged in the approved PMCP, and if there is any deviation, reasons thereof should be submitted to the RCOM, IBM, Bhubaneswar vide Rule 23E (2) of MCDR, 1988.	Proposed: As per PMCP of approved scheme of mining proposals were given for terracing of dumps, construction of retaining wall, gulland drain with settling pond, desiltation of settling tank, plantation in the safety zone and yearly monitoring of air, water and noise in the core zone. Achievement: Nothing has been carried out by the lessee.	This is due to the running of the mine intermittently for very short periods due to want of EC and Forest clearance.
xiii	The Financial Assurance of Rs. 2,35,855/- is valid upto 31.03.13. A new BG is to be submitted on or before 31.03.13 or before the expiry of the scheme period which is earlier.	This has not been deposited as the next scheme of mining has not been approved.	The BG is submitted along with the scheme of mining as per calculation.
xiv	A copy of EC letter issued by MoEF should be submitted to IBM, BBSR immediately after approval of EIA-EMP for record and information.	The EC has been issued by the State Environment Impact Assessment Authority, Odisha on 16.04.11. However, copy of the EC has not been submitted.	Copy of EC is annexed, Annex- II
xv	The Environmental Monitoring Cell shall continue monitoring ambient air quality, dust fall rate, water quality, soil sample analysis and noise level measurements at various stations established for the purpose both in core and buffer zones as per requirement of Environment Guidelines and keeping in view IBM's circular No 3/92 & 2/93 season-wise every year or by engaging services of an Environmental Laboratory approved by MoEF/CPCB. The data so generated shall be maintained in a bound paged register kept for the purpose and the same shall be made available to the inspecting officer, on demand.	Regular yearly monitoring has not been made excepting before preparation of EIA/EMP for the purpose of EC.	This is due to the running of the mine intermittently for very short periods due to want of EC and Forest clearance.



ivii	The provisions of Circular No 2/ 2010 of the CCoM, IBM, Nagpur issued vide letter No - 11013/3/MP/ 90-CCoM Vol, VI dated 06.04.2010 shall be complied within a period of 90 days of approval of this document.	As per this the DGPS surveyed map duly authenticated by authorized Govt. Agency i.e. ORSAC has not been obtained during the stipulated period. However, this has been obtained on 24.04.2012.
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d) REVIEW OF COMPLIANCE OF VIOLATIONS POINTED OUT AFTER INSPECTIONS MADE UNDER MCDR, 1988 DURING THE LAST FIVE YEARS, IF ANY: -

1. The task force of Indian Bureau of Mines inspected the mine on 25.08.2010 and ordered suspension of mining activities under Rule 13 (1) of the MCDR, 1988.

In compliance to the violations, the lessee submitted the modification of the approved scheme of mining under Rule 10 of M.C.D.R, 1988. Violations of the task force of IBM were attended in the modification as below:



Sl No	Nature of Deviation observed from approved Scheme of Mining by the Task Force of IBM	Compliance
1	In para 3.4 it was proposed to drill 2 and 3 nos of exploratory core holes during 2008-09 & 09-10 whereas no such drilling was carried out in lease area.	In para 3.4 it was proposed to drill 2 coring boreholes namely PBH 10 & 11 in 2008-09 and 3 coring holes namely PBH 13,14 & 15 in 2009-10. These boreholes could not be done in the stipulated period as all these holes are located within DLC forest land and the Forest Diversion Proposal (FDP) of the Mining Lease is yet to be approved. The FDP is in the processing stage at the level of DFO, Banail (Pl. refer Annexure-III). Para 3.4 of the approved scheme of mining has been duly modified (page No 10) where the backlogs of proposed exploration has been incorporated to be completed in the rest part of the present scheme period. The lessee has undertaken 15 nos of non-core drilling in the non-forest part during 2010-11(copy of Form K as Annexure - IV)



2	In para 5.2, mining was proposed in pit No-1 for iron ore during the year 2009-10, but no mining operation is being done in pit No-1.	It was proposed to mine pit No-1 during the year 2009-10 and also a total of 1000 tonnes of iron ore has been mined out. But due to non-approval of the FDP this quarry could not be advanced much to produce the proposed production of iron ore. The working plan at the mining site which was shown to the members of the Task force was not up-dated and the Floor RL mentioned (589m) in the working plan was not updated and gave the impression of non-mining of that quarry. Actually the quarry has been exploited in 2009-10 and the present Floor RL is 586m. The working plan at the site has been updated. Similarly the plans attached to this modification have been modified (pl refer (Plate No III, IV & VII).
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3	A new pit of 70m x 30m x 3m size for iron ore near mining lease boundary pillar B is excavated which was not proposed in approved scheme of Mining	Although eastern part of a does not come under forest land, exploration could not be taken up in this patch due to presence of human habitation. The pit mentioned in the violation was not in the proposal of scheme of mining. This has been done by the lessee for exploration purpose to know the extension of iron ore in that patch. In the process 5600 tonnes of iron ore has been produced from the pit. Although this pit is potential from iron ore point of view, cannot be continued by the lessee for mining as it is located well within the safety zone of the existing main transmission line. Therefore, it is proposed to backfill this pit in 2010-11 using the waste dumped in the adjacent dump and that of the dump situated in the north central part of the lease area. Part of the backfilled pit shall be utilized for temporary dumping purpose as was envisaged in the approved scheme of mining. The rest part of the backfilled pit shall be rehabilitated through plantation in 2011-12 (pl refer plate No VII).
4	There was proposal to produce 72,468 tonnes of iron ore during 2009-10 whereas 18,562 tonnes of iron ore is produced	This is due to the non-approval of the Forest Diversion Proposal of the involved forest land within the lease area. The FDP of the Mining Lease is yet to be approved. The FDP is in the processing stage at the level of DFO, Bonai (Pl refer Annexure-II).
5	There was proposal to produce 3,752 tonnes of manganese ore from Quarry No-5 during 2009-10 whereas no manganese production is carried out	This is also due to the non-approval of the Forest Diversion Proposal of the involved forest land within the lease area as the total manganese bearing area comes within forest land. The FDP of the Mining Lease is yet to be approved. The FDP is in the processing stage at the level of DFO, Bonai (Pl refer Annexure-III).



	In para 9.0 it was proposed to plant 1013 nos of saplings in safety zone area during the year 2009-10 whereas no such saplings were planted in mining lease area.	This is a lapse from the part of lessee and is due to non-fund of the mine in full magnitude. The mine has been closed temporarily by the DFO, Boudi from 17th February 2010 due to want of Environment clearance. To comply the violation it is suggested to take up plantation in the rest period of this scheme period including the backlogs of 2008-09 and 09-10. Accordingly the year-wise plantation programme of the approved scheme of mining has been modified (page No 13).
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2. Another violation under MCDR, 1988 was issued by IBM on 29.11.11. The compliance to this has also been submitted by the lessee to IBM. Copies of the violation and its compliance by the lessee are attached vide Annexure VIII F.

e) ANY OTHER POINTS, IF ANY: - No



CHAPTER - II

2.0 PROPOSAL UNDER SCHEME OF MINING FOR THE NEXT FIVE YEARS (2013-14 to 2017-18)

2.1 NAME AND ADDRESS OF APPLICANT. **THE : Permanent:** SAYED ABDUL HALIM,
Barbil Barfi
At/Po - Barbil
Dist-keonjhar
Tel /fax 06767-276229

Present address
2271, Room no21/22, 3rd floor, Sawal
complex, Cuttack road, BBSR-6
Tel/fax:0674-2311130
E-Mail
Sayedabdul.halim@rediffmail.com

2.2 NAME AND ADDRESS OF RQP WHO PREPARED THE MINING SCHEME, RQP REGISTRATION NUMBER & DATE OF VALIDITY OF RQP CERTIFICATE. **CHANDRA BHANU DAS**

Address:
Geo consultants Pvt. Ltd.
853, Gobind Prasad (Medical Lane)
Mahavir Nagar (in front of Radhika
Complex/Reliance fresh) Laxmisagar,
Bhubaneswar-751006
Phone - 0674-2575702, 9437019019 (m)
Regn. No. – RQP/ 885/052/2004/A
Valid up to -30.08.2014

2.3 MINERALS TO BE MINED. **: Iron & manganese ore**

2.4 LEASE DETAILS :
a) Name & Address **:Oraghat Iron & Manganese Mines,**
Oraghat, Sundergarh.



b) Lease hold area

: 25.847 Hect.

7.839 Ha.(Non forest Govt land)

12.12Ha.(Non forest private land)
which 11.10 Ha is fallow land and the
rest 1.02 Ha is inhabitation sites.

5.888Ha.(DLC Forest land)

c) Date of expiry of lease

: 05.04.2018

**d) Date of expiry of 5-year
period for last
approved Mining
scheme.**

: 31.03.2013.


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CHAPTER - III

3.0 RESERVE

3.1 CATEGORY WISE (PROVED, PROBABLE AND POSSIBLE) RESERVE AS GIVEN IN THE EARLIER APPROVED SCHEME OF MINING.

The Geological Ore Reserve as calculated in the Approved scheme of Mining for Iron & Manganese ore are as follows:

	Manganese ore in M.T.	Iron ore in M.T.
Proved reserve	15900	210049.4
Probable reserve	13612.5	235890.9
Possible reserve	13530	226640.4
TOTAL	43042.5	672600.7

The Mineable Ore Reserve as per recalculations (mining loss is 15%)

	Manganese ore in M.T.	Iron ore in M.T.
Proved reserve	15000	200443
Probable reserve	12540	231619.5
Possible reserve	12169	222679.8
TOTAL	39709	654742.3

3.2 DEPLETION OF RESERVE AS ON FEBRUARY 2013

A total of 50958 MT of Iron ore has been depleted in the last scheme period.

3.2.1 Geology:

Topography:

The Oraghat Iron & Mn ML area exhibits a gentle sloping topography. The ore body trends along NNE-SSW direction with a dip of 30° towards SE. The highest elevation of the area is 610 m, while the lowest elevation is 580m above mean sea level. The Suna Nala flows along the eastern boundary of the leasehold. There are no prominent drainage features within the leasehold. The area slopes towards SE.



3.2.1. Regional geology

The Precambrian rocks of this region comprising of basic lava, tuffs, banded iron formation (BIF), shales, conglomerates and sandstones etc. were mapped for the first time by Jones (1934). The stratigraphic succession established by Jones has largely been modified later by Dunn (1940). Based on detailed mapping in the northern parts of the belt, Dunn recognized a new group lying unconformably over the Iron Ore Group, which he named as the "Kolhan Group". The rock types of the area belonging to the Kolhan Group lies to the north of Nuamundi in Bihar.

The most acceptable litho - stratigraphic succession for the belt was proposed by Murthy and Acharya (1975). They identified different depositional facies and proposed a more detailed stratigraphic succession. They also proposed a new name the "Kotra Group" to the rocks of Bondi - Keonjhar belt.

The stratigraphy suggested by Murthy and Acharya (1975) has been laid out in the below table.

Kolhan Group	Sandstone, Conglomerate - Breccia
-----Unconformity-----	
Mixed Facies Formation	Basic Lava, tuffs and tuffites of Volcanic facies Iron, Manganese, lenses of iron formation, chert, small dolomite patches of chemical facies Minor lenses of sandy and silty shale of clastic facies
Banded Shale Formation	Banded shale member Black shale member Black shale-chert member



Koira Group

Banded iron
Formation

Finely banded Jaspilite member
Coarsely banded Jaspilite member

Volcanic
Formation

Tuffaceous shale
Basic lava

Basal sandstone, Gritty sandstone,
Quartzite Conglomeratic at places with inter-
bedded lava at top

—————Unconformity—————

Singhbhum Granite with enclaves of older meta-basic and meta-
sedimentary rocks.

The iron and manganese ore deposits in the area form a part of the South - eastern portion of the Singhbhum - Keonjhar - Bonai belt, also known as the Jamda - Koira valley and are represented by a narrow NNEly plunging folded synclinalorium of 60 km. long and 25 km. in width. The Precambrian horse - shoe shaped belt is well known for its large reserves of iron and manganese ore. The general strike is northeast to northerly and dips are moderate to the west. The western limb of the synclinalorium is slightly overturned.

Local Geology:

The Oraghat Iron & Mn Mines of Sri Sayed Abdul Halim forms a part of pre-cambrian Sedimentary formation forming the western limb of the famous horseshoe shaped synclinalorium comprising of iron ore group of rocks of pre-cambrian age of Jamda - Koira vally. The Special distribution of the iron ore deposits and occurrences of manganese ore broadly confirm to the major structure. This observation together with the fact that manganese is restricted in its occurrence to either the variegated shale or the laterite derived from the shale, bears out that there is a distinct stratigraphic control in the manganese mineralisation. physiographically the manganese ore deposits are restricted, in general to the relatively, low level plateau covered by laterite in contrast to the iron ore deposits which are found in different levels mostly at higher altitudes. It is



possible that the lateritic manganese ores are the manifestation of a secondary period of erosion and cauterization.

The iron ore located at this area is considered to be of secondary origin i.e. they are formed by desilicification of primary BHQ/BHJ rocks, which are called protones.

STRUCTURE

The lease area is situated at the eastern limb of the horse-shoe shaped syncline. The body strikes in N-S direction with dip of around 30° easterly. This limb is structurally more disturbed and folds of micro and mega scale are very common. Faults of major scale are rarely seen. Joints are numerous and developed due to competency of the rock.

3.3 ADDITIONAL RESERVE ESTABLISHED CATEGORYWISE.

There are five existing quarries present in the lease area, out of which four quarries namely Q-1, Q-2 & Q-5 are iron quarries and Q-3 & Q-4 expose both iron & manganese ore. Q-1 is well developed with four nos. of benches having floor R.L. 58&. In rest quarries there are 2 to 3 nos. of benches with a max height of 1 to 2 meter. In all the existing quarries ore is exposed in the quarry floor as well as in the walls of the benches. In the earlier approved scheme of mining reserve was estimated on the data revealed from the existing quarries. In the last scheme period i.e. in 2009-2010, 15 no. of DTH bore holes were drilled in the SW & SE parts of the lease area to know the potentiality of the ore body. In all the bore holes, iron ore with 55% to 65% Fe have been encountered. The detail report of chemical analysis has been annexed. From the bore hole it has also been found that the thickness of the ore body varies from 15m-20m in some of the boreholes. So for more authenticity of the reserve it has been considered to re-access the reserve during the present scheme period.

3.3.1 Method of Estimation of reserve

For the scheme period from 2013-14 to 2017-18, reserve has been re-accessed based upon the bore hole data and existing quarry features. In the last scheme period the lessee has drilled 15 DTH boreholes in the SW & SE part of the leasehold which are very much promising as revealed from their chemical analysis. For the estimation of reserve the total lease area has been divided in to three blocks namely Block-I Block-II and Block-III. Q-1 is



located in block-I, Q-5 in block-II, Q-2, Q-3 and Q-4 in block-III. No mining or exploration activities have been taken up in Block III. Therefore attempt has not been made to estimate the reserve of this Block III. Only the position of the quarries has been located in proper place as per re-survey which were wrongly placed in the earlier approved scheme of mining.

Cross sectional area method has been adopted for the estimation of reserve for Block I & II. Six nos. of cross sections have been drawn based on the sub-surface openings and drilled boreholes. All bore holes except borehole no 7 have been plotted on the cross sections for reserve estimation. Borehole 7 and 6 are located on north and south of section 4-4'. As such only BH 6 has been considered for reserve estimation. The interpreted ore boundary for both the iron and manganese has been drawn according to the influence of the bore holes and existing quarries. From the boreholes it has been revealed that all the boreholes are ore bearing and the chemical analysis indicates that the grade of iron ore varies from 55% -62%. So grade wise reserve has been estimated.

Cross-sectional area of the ore zone has been derived from the respective cross sections. Length of influence of each section has been considered as the distance between two consecutive sections. The cross sectional area is multiplied with respective length of influence of ore zone, Recovery factor and tonnage conversion factor which have been calculated as per past mining experience, to obtain the geological reserve under different categories such as proved, probable and possible.

In the process of reserve re-estimation in Block I & II, ore zone has been extended 50m from the existing quarry or borehole. However, no ore zone has been extended beyond the existing road in the easterly direction in Block I as geologically there is very little chance of existence of ore.

In Block III two ore zones have been deciphered basing on geological mapping and quarry observations. The iron ore zone exists to the eastern side of Block III whereas the eastern part of this block exposes both iron and manganese ore.

The detail reserve has been furnished in the table 3.1 to 3.4. The categorization of reserve has been made as below:

G-1 - Reserve up to the mineralised end of bore holes or quarries has been put under G1 category.



G-2 - Based on the behaviour of the mineral occurrence in the existing reserve, it is anticipated that the deposit may continue below G1 depth. Similarly the boreholes have been closed prematurely in ore zones. Therefore, reserve up to a depth of another 5 m beyond the zone of G1 reserve has been put under probable category for different cross sections.

G-3 The reserve up to a depth of further 3 m. beyond the zone of G2 has been considered as G3 zone for reserve estimation for iron ore.

The above classification has been attempted only in Block I & II where re-estimation of reserve has been made. In Block III the estimated reserve of the previous approved scheme of mining has been categorized in to different UNFC groups based on different criteria's.

3.3.2 Parameters of reserve estimation

3.3.2.1 Cross-sectional area

The cross sectional area of the ore zone has been measured from the respective sections. In total there are 6 cross-sections.

3.3.2.2 Length of Influence

Six sections have been taken in to consideration for reserve estimation. The length of influence for all the 6 sections is taken differently.

3.3.2.3 Recovery Factor/Incidence Factor

The percentage of ore recovered from the total excavation is described as "recovery factor". In case of iron ore, 70% has been taken as the recovery factor, and 15% has been taken as the recovery factor for manganese ore as per field test.

3.3.2.4 Bulk Density

The bulk density has been calculated as 3.0 MT/m³ for iron ore reserve and 2.5 MT/m³ for manganese ore reserve.

3.3.2.5 Cut off Grade:

Cut off grade for iron ore has been considered at 58% Fe. Therefore, ore having Fe% > 45% and < 58% has been considered as sub-grade. However, as per data of exploration sub-grade ore in the range of 45 to 55% Fe is not available in the leasehold. For manganese 20%



Min has been considered as the cut-off grade, in total the geological reserve of grade iron ore has been calculated to be 190260MT out of which 137382MT

3.3.2.6 Stripping Ratio: The overall stripping Ratio of iron ore of the leasehold is 1:0.14 MT/ m³ and that of manganese ore is 1:2.26 MT/ m³ at ultimate pit limit.

3.3.2.7 Mineral Rejects: There will be production of no mineral rejects from the leasehold.

3.3.2.8 Associated overburden: Laterite and lateritic soil constitute the major overburden in the leasehold. Ferruginous shale and quartzite are mostly encountered as inner-burden.

3.3.3 Geological reserves and grade

The geological reserves for both the iron & manganese deposits have been calculated by cross-sectional method. For cross sectional reserve estimation the following formula has been used.

$$R = A \times L \times BD \times RF$$

Where R = Geological reserve in Metric Tonnes (MT)

A = Area of cross-section in m²

L=Length of influence in m

BD= Bulk Density in MT/ m³

RF = Recovery Factor/incidence of ore

3.3.3.1 Mineable Reserve

The mineable reserve has been estimated by taking into account slope factor and safety zone.

3.4 YEAR WISE FUTURE PROGRAMME OF EXPLORATION:

A total of 19nos. of coring bore holes till the end of mineralisation zone have been proposed to explore the total area in the next two years i.e. 2014-15 and 2015-16. The boreholes to study the potentiality of the deposit would be preferably coring at an interval of 50x50 m. Based on outcome of the proposed boreholes, some more boreholes may be



proposed in closer grids for both iron and manganese ore zones. Depth of bore hole would be till the end of mineralisation. It is also proposed to drill two bore holes. The proposed 19 to go up to a depth of more than 100m to have a clear picture of the depth ward rock type. The detail has been given below.

YEAR	PBH NO	Depth of bore hole in m	LOCATION
14-15	Core (1 to 8)	Till the end of mineralisation zone	300W-200N, 300W-300N, 300W-400N 300W-500N, 300W-600N, 200W-600N 200W-500N, 200W-400N, 200W-300N
15-16	Core (10 to 19)		200W-200N, 100W-600N, 100W-500N 100W-400N, 100W-300N, 100W- 200N, 100W-100N, 00-400N, 00- 200N, 00-100N

3.5 CATEGORYWISE UPDATED RESERVE WITH GRADE (INDICATING END-USE GRADE WITH ANALYSIS) AS WELL AS MARGINAL GRADE:

The present re-estimation of reserve can be considered as up dated reserve as on 31.03.2013. as the depletion due to mining activities have been taken in to consideration in the sections, while calculating the reserve position.



Geological reserve of iron ore in forest land Block-I				
	G-1	G-2	G-3	Total
60-62	86022	94490	64260	244772
58-60	19374	15359	11575	46259
55-58	13020	16800	10080	39900
TOTAL	118367	126649	85915	330931
Geological reserve of iron ore in non forest land Block-I				
	G-1	G-2	G-3	Total
60-62	211369	177511	80940	469820
58-60	57393	16675	8459	82547
55-58	17959	13440	7560	38959
TOTAL	286721	207646	96959	591326
Geological reserve of iron ore in forest land of Block-II				
	G-1	G-2	G-3	Total
60-62	0	0	0	0
58-60	21945	9975	5985	37905
55-58	11970	0	0	11970
TOTAL	33915	9975	5985	49875
Geological reserve of iron ore in non forest land Block-II				
	G-1	G-2	G-3	Total
60-62	402654	134295	78782	615731
58-60	57855	31920	21546	111321
55-58	138852	0	0	138852
TOTAL	599361	166215	100328	865904

Geological reserve of iron ore in forest land Block-III (as per previous approved scheme of mining)				
	G-1	G-2	G-3	Total
TOTAL	79017	74035	69909	222961

Geological reserve of Mn ore in forest block-III(as per previous approved scheme of mining)	
G-1	15900
G-2	13612.5
G-3	13530
Total	43042.5



Mineable reserve of iron ore in forest land of Block-I			
	G-1	G-2	Total
60-62	86022	74275	160297
58-60	19324	15359	34684
55-58	12012	12600	24612
TOTAL	117359	102234	219593
Mineable reserve of iron ore in non forest land of Block-I			
	G-1	G-2	Total
60-62	128717	77949	206686
58-60	48033	16695	64728
55-58	11407	2688	14095
TOTAL	188158	97332	285510
Mineable reserve of iron ore in forest land of Block-II			
	G-1	G-2	Total
60-62	0	0	0
58-60	0	0	0
55-58	1995	0	1995
TOTAL	1995	0	1995
Mineable reserve of iron ore in non forest land of Block-II			
	G-1	G-2	Total
60-62	367542	110618	478160
58-60	40299	20549	60848
55-58	138852	0	138852
TOTAL	546693	131166	677859

Mineable reserve of iron ore in forest land Block-III(as per previous approved scheme of mining)				
	G-1	G-2	G-3	Total
TOTAL	75633	73290	148923	TOTAL

Mineable reserve of Mn ore in forest land of Block-III(as per previous approved scheme of mining)	
G-1	15000
G-2	12540
Total	27540


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SUMMARY OF THE RESERVE

Geological reserve of iron in MT									
	Block-I		Block-II		Block-III		Total in Forest	Total in NF	Grand Total
	F	NF	F	NF	F	NF			
G-1	11838 7	28872 1	3391 5	59936 1	79017	0	23129 9	886082	111738 1
G-2	12664 9	30764 6	9975	16621 5	74035	0	21065 9	373881	584520
G-3	85915	96959	5985	10032 8	69909	0	16180 8	187287	359098
TOTAL	33093 1	59132 6	4987 5	86590 4	22296 1	0	60376 7	145723 0	206099 7

Geological reserve of Mn in forest block-III	
G-1	15900
G-2	13612
G-3	12530
Total	42042

Mineable reserve of iron in MT									
	Block-I		Block-II		Block-III		Total	Total in	Grand
	F	NF	F	NF	F	NF	in Forest	NF	Total
G-1	11735 9	18815 8	1995	54669 3	75633	0	15498 7	734851	929838
G-2	10228 4	97352	0	13116 6	78290	0	17552 4	228518	404042
TOTA L	21963 3	28551 0	1995	67785 9	14893 3	0	37051 1	963369	133388 0

Mineable reserve of Mn in forest land of Block-III	
G-1	15000
G-2	12540
Total	27540

3.6 Justification of UNFC:

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On economic front, mining plan for the area has been approved and the materials already were being dispatched to the consuming industry for further use. The area is

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suitable having good market value and end use. Land use pattern, working plan is already known or designed for future use. Forest land is not involved. Thus the reserves can be brought under E1.

On feasibility axis, grade of ore of this patch is certain and has been scientifically extrapolated. Leasehold area is valid as per MCR 1960. There will be no displacement. Thus, the resources can be brought under F1.

Detailed geological survey has been carried out, surface exposures, drilling data & quarry observations have been plotted in the geological map on scale 1:1000. Detailed exploration by putting boreholes was carried out, number of pits were opened which later on converted into quarries. Exploratory mining and systematic sampling have been undertaken within the lease. The proved reserve has been estimated based on the actual thickness of the ore body as exposed in quarry faces and boreholes. Thus geological axis can be brought under G1.

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On economic front, mining plan for the area has been approved and the materials already were being dispatched to the consuming industry for further use. The ore is suitable having good market value and end use. Land use pattern, working plan is already known or designed for future use. Forest land is not involved. Thus the reserves can be brought under E1.

On feasibility axis, grade of ore of this patch is certain and has been scientifically extrapolated. Leasehold area is valid as per MCR 1960. There will be no displacement. However, Feasibility has been ascertained for the ore which is extrapolation of G1. Thus, the resources can be brought under F2.

Based on the exploration carried out in the area and also from the nearby quarries, the ore zone has been extended 5m depth-wise beyond G1 zone. This extension of the ore body is kept under G2 category assuming that the ore body may continue further. Thus, the geological axis can be brought under G2.


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221 & 222

G1 Reserve blocked due to pit slope factor, safety zone, sub-grade ore and within forest land has been termed as 221. Similarly G2 Reserve blocked due to pit slope factor, safety zone, sub-grade ore and within forest land has been termed as 222.

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As no scientific exploration has been taken up in this patch and the reserve has been assessed based on extrapolation of the nearby borehole and quarry, economic aspect of these ore is uncertain and has been placed in the lowest category i.e. E3. Similarly, on the feasibility front, this has been categorised as F3.

Geological prospecting including mapping, assessment of lithology and analysis of the nearby quarries has been taken up. Further depth-wise extension has been assumed beyond the probable zone. Future exploration has been planned to prove the possible extension of the ore body. As such this can be categorised as G3.

As per the above parameters the resources as per UNFC codification as follows

Classification	Code	Iron ore In MT	Mn ore In MT
Total Mineral Resources (A+E)		2040197	43042
A. Mineral Reserves			
(1) Proved Mineral Reserves	111	554597(Fe% 58-62)	
(2) Probable Mineral Reserves	121	0	
Probable Mineral Reserves	122	225830(Fe% 58-62)	
B. Remaining Resources			
(1) Feasibility Mineral Resources	211		
(2) Prefeasibility Mineral Resources	221	251289(F)+151231(Blocked) (Fe% 58-62) +150259 (SG-Fe% 55-58)= 532789	15900 Mn % 20-30
Prefeasibility Mineral Resources	222	210639(F)+145343(Blocked) (Fe% 58-62) +2888 (SG-Fe% 55-58)=358870	136120(Mn % 20-30)
(3) Measured Mineral Resources	331		
(4) Indicated Mineral Resources	332		
(5) Inferred Mineral Resources	333	359096(Fe% 55-62)	13500(Mn % 20-30)
(6) Reconnaissance Mineral Resources	334		

Demonstrated mineable reserve of iron ore -563369 Mt
Demonstrated mineable reserve of iron ore -Nil



Grade of Iron Ore:

As revealed from analysis of borehole samples the grade of iron ore is as below:

(a)	Iron Ore		
	Fe	-	>58% - <62%
	SiO ₂	-	<4%
	Al ₂ O ₃	-	<5%

Grade of Manganese Ore:

The mine is temporarily closed and the manganese ore zone is in the forest patch.

Therefore, it was not possible to analyse manganese samples. However, as per earlier analysis, grade of Mn ore is as below:

Manganese Ore			
Mn	-	-	Around 30%
Fe	-	-	15% (Max)
Al ₂ O ₃	-	-	<7% (acceptable up to 8%)
SiO ₂	-	-	10% (Max)
P	-	-	0.15% (Max)

Table No 3.1 GEOLOGICAL RESERVE OF BLOCK-I

Section Coal-derived	Grade of iron ore	Area of cross section m ²	Length of influence in m	Volume of Exposed Iron(m ³)	Vol. of ore (m ³)	Surgeage (MT)	Vol. of intercalated waste (m ³)	Vol. of Ore m ³	Volume of total waste m ³	Swell vol. of total waste m ³	Shipping ratio	Reserve category
a	b	c	d	e=acd	f=exd.70	g=fx0.3.0	h=exd.30	i	j=a+h	k=jx1.4	l=j	m
Non diverted forest land 3.3	60-62	181	65	9815	6871	20412	2945	0	2945	4122	0.14	Hydrobio
	60-62	142	65	10000	7071	22113	3159	0	3159	4423	0.14	Hydrobio
	<45	754	65	50962	0	0	0	0	50960	71144	0.00	Proximate
Sub-total		1077		71305	14242	42725	6104	0	50960	71144	0.00	
Non forest land 3.2	60-62	507	65	34255	23979	71938	10277	0	10277	14387	0.29	Proximate
	60-62	143	65	10725	7508	22573	3218	0	3218	4505	0.14	Proximate
	<45	662	65	48030	0	0	0	0	48030	60242	0.00	Proximate
Sub-total		1354		88010	31486	94458	13494	0	43030	60242	0.00	
Non diverted forest land 3.3	60-62	203	53	11923	8348	25043	3578	0	3578	5009	0.14	Proximate
	60-62	160	53	9480	5936	17826	2544	0	2544	3562	0.14	Proximate
	60-62	60	53	3180	2204	6678	954	0	954	1336	0.14	Proximate
Sub-total		423		24583	16488	49547	7076	0	16488	24583	0.14	Proximate
Non forest land 3.2	60-62	154	53	8162	5713	17140	2449	0	2449	3428	0.14	Proximate
	60-62	138	53	7314	5120	15328	2184	0	2184	3072	0.14	Proximate
	60-62	104	53	5512	3868	11375	1654	0	1654	2315	0.14	Proximate
Sub-total		456		21588	15301	43843	6317	0	15301	21588	0.14	Proximate
Non forest land 3.3	60-62	1497		79341	31201	93603	13072	0	31201	43673	0.00	
	60-62	730	53	38690	27283	81249	11607	0	27283	38690	0.00	
	60-62	293	53	15570	10758	32277	4411	0	10758	15570	0.14	Proximate



40-42	146	33	8798	6139	18479	2639	0	2639	3695	0.14	Proved
50-60	340	33	18030	12614	37843	5426	0	5426	7568	0.14	Proved
50-60	150	53	7830	5363	16693	3363	0	3363	3369	0.14	Proved
50-60	26	33	4028	2820	8439	1328	0	1328	1692	0.14	Proved
445	274	53	41027	0	0	0	41027	41027	57431	0.00	Proved
Sub-total	2526		133878	68999	196999	27952	41027	68979	96430	0.88	
TOTAL	4023		213219	96200	288601	41229	75790	117019	163826	0.41	
non diverted forest land 4-4	40-42	50	24450	17115	51545	7326	0	7326	10289	0.14	Proved
40-62	286	50	14000	10010	30030	4290	0	4290	6006	0.14	Proved
60-62	189	50	9450	6415	16865	2836	0	2836	3969	0.14	Proved
445	574	30	28700	0	0	0	28700	28700	40180	0.00	Proved
Sub-total	1754	200	76900	30740	107620	14462	28700	43160	60424	0.43	
non forest land 4-4	40-42	50	24150	37905	112715	16345	0	16345	22743	0.14	Proved
40-62	480	50	23800	16100	40200	6900	0	6900	9660	0.14	Proved
60-62	308	50	15000	10750	32150	4290	0	4290	6426	0.14	Proved
50-60	87	50	4350	3045	9135	1325	0	1325	1827	0.14	Proved
445	757	50	37650	0	0	0	37650	37650	52990	0.00	
Sub-total	4163		134050	67760	202280	29540	37650	67190	91646	0.57	
TOTAL	5917		231550	101500	304500	43500	68550	110050	154070	1	
non diverted forest land 5-5	50-60	40	1040	728	2184	312	0	312	437	0.14	Proved
55-58	62	40	2460	1736	3208	744	0	744	1042	0.14	Proved
50-58	200	40	8000	5600	16800	2400	0	2400	3360	0.14	Proved
55-58	120	40	4800	3360	10080	1440	0	1440	2016	0.14	Proved
445	764	40	31360	0	0	0	31360	31360	43004	0.00	
Sub-total	1192		47640	11424	34272	4859	31360	36224	50758	0.57	
non forest land 5-5	50-60	40	4960	3472	10416	1408	0	1408	2083	0.14	Proved
55-58	158	40	6320	4424	13272	1896	0	1896	2654	0	



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Sl. No	140	40	6400	4400	13440	1920	0	1920	21888	0.14	Productive Positive
55-58	80	40	30000	25200	75600	10800	0	10800	15112	0.14	Productive Positive
445	766	40	30640	0	0	0	30640	30640	428866	0.00	
Sub-total	1238		51320	14004	44488	6364	30640	37704	51834	0.57	
TOTAL	2490	0	96600	26320	78960	11280	62000	73280	102592	1.142857	
Non cleared forest land 6-a	74	62	4548	3212	9635	1376	0	1376	1927	0.14	Productive Positive
60-62	200	62	12600	8680	26040	3720	0	3720	5208	0.14	Productive Positive
60-62	120	62	7440	5208	15456	2032	0	2032	3125	0.14	Productive Positive
55-58	60	62	3720	2604	7812	1116	0	1116	1562	0.14	Productive Positive
445	782	62	48484	0	0	0	48484	48484	67878	0.00	
Sub-total	1236		76612	19754	59111	8444	48484	56728	79700	0.57	
non forest land 6-b	156	62	7812	5468	14425	2344	0	2344	3281	0.14	Productive Positive
60-62	142	62	11904	8332	24798	3571	0	3571	5000	0.14	Productive Positive
60-62	60	62	3720	2604	7812	1116	0	1116	1562	0.14	Productive Positive
55-58	36	62	2232	1562	4487	670	0	670	937	0.14	Productive Positive
445	628	62	38936	0	0	0	38936	38936	54530	0	
Sub-total	1042		64604	17948	53905	7760	38936	46696	652991	0.57	
TOTAL	2278		141236	37671	113014	16144	87420	103565	144991	1.14	
Grand TOTAL	1719		624720	307419	922257	131750	385230	517920	724931	4.58	



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Table No 3.2 MINERABLE RESERVE OF BLOCK-I

Section Coal-dense	Grade of iron ore	Area of cross section m ²	Length of influence in m	Volume of Excavation (m ³)	Vol. of ore (m ³)	Tonnage (MT)	Vol. of material wasted (m ³)	Vol. of Ore m ³	Volume of total waste m ³	Swell vol. of total waste m ³	Shipping ratio	Reserve category
	B	C	d	m ³ (x)g	g=440.29	g=440.29	less 0.30	g	(m ³ x 1.4)	1.4	1/3	
Non diversified forest land 3-2	80-82	131	65	6113	2661	1166.3	2555	0	2555	3576	0.14	Probable
	+45	424	65	27362	0	0	0	27360	27360	38584	0.03	
		555		36075	5963	1788.2	2555	27560	30115	42160	0.14	
Non forest land 3-2	80-82	346	65	22490	15743	472.29	6747	0	6747	9446	0.14	Probable
	+45	190	65	12350	0	0	0	50440	50440	70616	0.00	
Sub-total		536		34840	15743	472.29	6747	50440	57187	80062	0.14	
		1091	0	70915	21703.5	65110.5	9301.5	78000	87301.5	122222	0.29	
	80-82	221	53	11825	8048	2504.0	3576	0	3576	5009	0.14	Proved
Non diversified forest land 3-2	80-82	148	53	7044	5491	1647.3	3153	0	3153	4294	0.14	Probable
	58-60	154	53	8162	5713	1714.0	2449	0	2449	3428	0.14	Proved
	58-80	138	53	7314	5120	1509.8	2194	0	2194	3072	0.14	Probable
Sub-total	+45	434	53	34748	0	0	0	34748	34748	48675	0.00	
		1321		70013	24872	7401.5	10574	34768	45342	63478	0.00	
	80-82	424	53	22472	15793	4719.1	6742	0	6742	9438	0.14	Proved
Non forest land 3-3	80-82	18	53	934	666	2003	286	0	286	401	0.14	Probable
	58-60	201	53	10913	11909	3572.7	2108	0	5104	7145	0.14	Proved
	58-80	150	53	7950	5545	1609.5	2383	0	2383	3339	0.14	Probable
Sub-total	+45	43	53	2918	0	0	0	2915	2915	4081	0.00	
		968		51304	33872	10163.7	14517	2915	12432	24404	0	
		2289		121317	58543.8	175631.4	25090.2	37683	62773.2	87882.48	0.14	



Non disturbed forest land 4.4	60-63	489	50	24450	17135	51345	7303	0	7338	10249	0.14	Proved
	60-62	250	50	12500	8750	26250	3750	0	3750	5250	0.14	Proved
	<45	540	50	27000	0	0	0	27000	27000	37800	0.00	Proved
	Sub-total	1279		63950	25885	77595	11063	27000	38665	53319	0.29	
Non forest land 4.4	60-63	707	50	35350	24745	74335	10403	0	10403	14847	0.14	Proved
	60-62	172	50	8600	6000	18600	2580	0	2580	3612	0.14	Proved
	55-58	18	50	900	630	1490	270	0	270	376	0.14	Proved
	<45	154	50	7700	0	0	0	7700	7700	10780	0.00	
Non disturbed forest land 5.3	60-63	26	40	1040	728	2184	312	0	312	437	0.14	Proved
	55-58	50	40	2000	1400	4200	400	0	400	560	0.14	Proved
	55-58	150	40	6000	4200	12600	1800	0	1800	2520	0.14	Proved
	<45	748	40	29920	0	0	0	29920	29920	41888	0.00	
Non forest land 5.3	60-63	124	40	4960	3472	10416	1488	0	1488	2083	0.14	Proved
	55-58	80	40	3200	2240	6720	840	0	840	1144	0.14	Proved
	55-58	32	40	1280	896	2688	384	0	384	528	0.14	Proved
	<45	94	40	3760	0	0	0	3760	3760	5264	0.00	
Non disturbed forest land 6.4	60-63	74	62	4588	3312	9635	1376	0	1376	1927	0.14	Proved
	60-62	108	62	6516	4537	13671	1953	0	1953	2734	0.14	Proved
	55-58	40	62	3720	2404	7012	1114	0	1114	1562	0.14	Proved
	<45	793	62	48484	0	0	0	48484	48484	67678	0.00	
Non forest land 6.4	60-63	54	62	3472	2400	7291	1042	0	1042	1458	0.14	Proved
	60-62	80	62	5084	3259	10474	1525	0	1525	2135	0.14	Proved
	55-58	34	62	2332	1560	4450	670	0	670	937	0.14	Proved

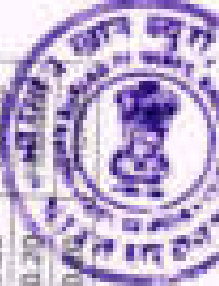
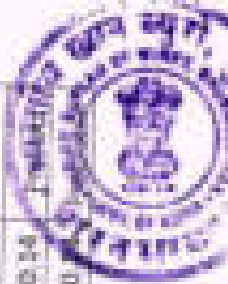


Table No 3.3
GEOLOGICAL RESERVE OF BLOCK-B

Section Coal-dined	Grade of iron ore	Area of cross section m ²	Length of influence in m	Volume of Excavation (m ³)	Vol. of ore (m ³)	Tonnage (MT)	Vol. of intercalated waste (m ³)	Vol. of CB m ³	Volume of total waste m ³	Swel vol. of total waste m ³	Shipping ratio	Reserve category
B	B	5	0	0	1000.70	0	1000.70	0	1000.70	1000.70	1.00	Proved
	55-58	40	95	3700	3000	11970	1710	0	1710	2394	0.14	Proved
	58-60	110	95	10450	7315	21645	3135	0	3135	4389	0.14	Proved
	58-60	50	95	4750	3325	9975	1425	0	1425	1995	0.14	Proved
	58-60	50	95	2850	1995	5985	855	0	855	1197	0.14	Proved
	<45	11	95	1045	0	0	0	1045	1045	1461	0.00	Proved
	B+C-total	261		24795	16025	40875	7125	1045	8170	13408	0.16	Proved
Non forest land 1.1	55-58	804	95	8170	40354	138052	19834	0	19834	27770	0.14	Proved
	58-60	790	95	7590	19202	57651	8245	0	8245	11571	0.14	Proved
	58-60	160	95	15300	10640	31920	4540	0	4540	6384	0.14	Proved
	58-60	108	95	10260	7162	21544	3078	0	3078	4309	0.14	Proved
	60-62	612	95	58140	40358	120794	17442	0	17442	24419	0.14	Proved
	60-62	290	95	27420	19205	57651	8245	0	8245	11571	0.14	Proved
	60-62	165	95	15675	10679	30718	4753	0	4753	6584	0.14	Proved
	<45	291	95	27445	0	0	0	27445	27445	38703	0.00	Proved
	B+C-total	2612		248140	154347	463040	66149	27645	93794	131311	0.20	Proved
	Total	2873		273935	170572	512935	73174	28690	301964	342749	0.17	Proved
Non forest land 2.2	60-62	1670	90	131600	93520	280560	40380	0	40380	56112	0.14	Proved
	60-62	435	90	39400	25480	76440	30920	0	30920	43288	0.14	Proved



	60-62	273	80	21840	15288	45804	6552	0	8552	9173	0.14
	63-65	175	80	13600	0	0	0	13600	13600	13040	0.00
Sub-total		522		205440	154288	462804	57552	13600	71152	99613	0.43
Grand Total		1395		478375	306260	915779	130824	42290	179316	242362	0.79



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Table No 3.4 MINABLE RESERVE OF BLOCK-II

Section Considered	Grade of iron ore	Area of cross section m ²	Length of influence in m	Volume of Escarpment (m ³)	Vol. of ore (m ³)	Tonnage (MT)	Vol. of infiltrated waste (m ³)	Vol. of Ore m ³	Volume of total waste m ³	Total vol. of total waste m ³	Shipping ratio	Reserve category
Iron ore (hard) 1-1	1	5	0	0	0	0	0	0	0	0	0	1-1
	55-58	10	95	950	665	2995	285	0	285	399	0.14	1-1
	55-58	10		950	665	2995	285	0	285	399	0.14	1-1
	55-58	605	95	6050	4284	18852	1856	0	1856	2770	0.14	1-1
	58-60	202	95	19190	12433	80099	5757	0	5757	8060	0.14	1-1
Iron ore (hard) 2-2	58-60	103	95	9785	6830	29549	2934	0	2934	4110	0.14	1-1
	60-62	812	95	77140	45886	129994	17442	0	17442	24419	0.14	1-1
	60-62	285	95	27275	18953	84058	8123	0	8123	11371.5	0.14	1-1
	<45	158	95	15010	0	0	0	0	0	17696	0.00	1-1
	Sub-total	2056		195520	126217	378651	54781	12640	66731	93426	0.71	1-1
Non-ferrous ore 1-1	2056	2056	0	196370	124882	380346	34178	12640	67018	93825.2	0.857143	1-1
	60-62	1461	80	116880	81816	245448	35264	0	35264	48990	0.14	1-1
	60-62	300	80	25600	17920	53760	2680	0	2680	10752	0.14	1-1
	<45	149	80	11920	0	0	0	0	0	10752	0.14	1-1
	Sub-total	1010		154400	99736	299208	42744	13600	13600	19040	0.00	1-1
Grand Total		3996		350670	226618	679854	97123	26240	56344	78882	0.39	1-1
									123162	172707		1-1





CHAPTER -- IV

4.0 CONCEPTUAL MINE PLAN

4.1 Anticipated life of the mine

The demonstrated reserve of iron ore within the area has been worked out to be 963369 MT. The max annual output of the mines in a year has been envisaged to be around 49245 MT. At this rate of annual output of the mines the reserve will last for a period of about 19.56 or say 20 years from now. However, this may not hold well all the time. By making assessment of reserve from time to time the life of the deposit may increase or decrease.

The mineable reserve of Manganese under proved category within the area has been worked out to be 27540 MT. No proposal has been submitted for manganese ore as exploration has not been taken up in the area. This will be planned after completion of exploration.

Efforts will be made to drill exploratory boreholes into probable reserve zones to convert it to proved category whereby the life of the mines may increase. The ultimate pit limit will be revised as per the results of exploration.

Therefore, the conceptual planning has been considered for the life of the mines. Position of working benches at the end of life of the mine has been shown along with the waste dump and tree plantation.

4.2 The ultimate extent and size of the pit

Ultimately the total mineralized area will be mined out in three blocks namely i.e. Block-I, Block-II and Block-III (plate VIII). During the course of mining conceptually the block-I and Block-III will be merged in to a single quarry and ultimately the extent of ultimate pit limit will be 70400 m². The ultimate mined out area of Block-II will be 12728m². The total ultimate pit limit area at the conceptual period will be 83128 m². Both lateral & depth-wise UPLs have been demarcated based on findings of boreholes and existing quarries and are shown in conceptual plan and sections.

Ultimate pit limit has been fixed based on outcomes of boreholes, existing outcrop of the ore and findings of quarries. Based on the current exploration status, depth of UPL



will go up to 565 m and 557 m in Block-I and Block-II respectively. The dimension of merged Block-I & Block-II is 435m x 160m x 25 m and dimension of Block-III is 150m x 85m x 20m.

4.3 Ultimate slope angle

During proposed scheme period, the individual benches will be kept nearly vertical. Ultimate pit slope will be kept at 45° with the horizontal by maintaining height and width of benches at about 6m.

4.4 Ultimate pit limit boundaries

Ultimate pit limit boundaries have been earmarked in conceptual plan and sections (Ref plate no - VIII & VIIIA).

4.5 Ultimate capacity of the dump

During the ensuing scheme period mining activities will be confined in the iron quarry i.e Q1 only. A quantity of 39327 m^3 vol. of waste (swell waste-55058 m^3) will be generated from the iron quarry in the ensuing scheme period. One dump exists over an area of 1350 m^2 at the eastern side of the lease area accommodating 877 m^3 waste. It has been proposed to dump the generated waste on dump-A at the earmarked site of the lease area. In the ensuing scheme period a total vol. of 39327 m^3 waste will be generated. The waste generated from the quarry in the ensuing scheme period shall be accommodated in the dump-A. Dump A has been proposed at the site over plot 194 where the lessee possesses surface right. Safety zone areas in Q-3 & Q5 and safety zone along village road in Q1 are found to be disturbed due to mining. A total vol. of 4257 m^3 has been excavated from the safety zone of the above said quarries. So it has been proposed that the waste of existing dump of vol. 877 m^3 shall be rehandled during 2013-14 to backfill these disturbed safety zones. The remaining required waste of vol. 3380 m^3 shall be procured from the generated waste of mining operation for the same year.

The proposed dump A will be spreading over total area of 3910 m^2 . Dump-A is proposed to be encircled by retaining wall and garland drain connected to settling tank. Dumping in Dump A will be advanced in western direction in retreating fashion. It is calculated that 55058 m^3 of waste shall be generated in the scheme period from iron ore mining. Out of this 3380 m^3 waste from 2013-14 will be utilised for backfilling purpose of disturbed safety



zone area. Remaining 51678 m³ will be dumped on the dump-A. Dump-A will require 0.391 ha. Height of Dump - A is proposed at 20m with two terraces each of 10m. It has been also proposed one more dump over 1.082 ha, comprising of 3 nos. terraces to accommodate the generated waste conceptually. The ultimate capacity of dump is 435073m³ with top RL 615meter.

Stacking of sub-grade ore, Top-soil & Mineral rejects

No topsoil/mineral rejects will be generated during conceptual period. As per present calculated reserve, there will be no sub-grade ore. However, it is expected that some amount of sub-grade ore may be generated during conceptual period which is proposed to be fully utilized by blending with high grade ore. So no separate stock has been earmarked for the purpose of stacking sub-grade due to this reason.

4.6 Land degradation/reclamation/Afforestation

During conceptual period an area of 8.1323ha will be degraded for mining. There is no proposal for reclamation of any quarry during this scheme period as there will be no exhaustion of ore achieved by any quarry during this period. Also, the exploration is yet to be completed and the depth of occurrence of ore is still unknown.

It is planned to reclaim the mine out land by backfilling. The stored wastes of the dumps will be used for the purpose. Simultaneous backfilling will commence from the next scheme period when there will be sufficient excavated area, which can be backfilled. However in the ensuing scheme period the 10 meter safety zone area along the village road adjacent to Q1, 7.5 meter safety zone along the mine boundary of Quarry 3 and the safety zone of the existing powerline near Quarry 5 have been proposed for backfilling in the year 2013-14 and plantation has been proposed over backfilled area in the year 2014-15. The following table shows the backfilling and rehabilitation programme for the ensuing scheme period.


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Year	Location	Area in m ²	Vol. of waste required in m ³	Waste disposal
2013-14	10meter along village road of Q1 & 7.5 meter safety zone along mine boundary of Q3 & safety zone of the powerline Q5	1802	4257	Existing dump and waste from Q-1

Post mining land use pattern

Below table depicts the post mining land use pattern.

Categories	Area of present (Ha)	Area during scheme period (Ha)	Total Area (Ha)	Area of the conceptual period (Ha)
Area to be excavated for mining	1.47	0.32	1.79	8.312
Mineral Storage	0.163	0.382	0.545	Nil
O.B dump	0.135	0.391	0.526	Nil
Road	0.786	0.110	0.896	Nil
Infrastructure	0.011	Nil	0.011	Nil
Magazine	Nil	0.037	0.037	Nil
Green belt	Nil	1.046	1.046	3.8735
Total	2.565	2.286	4.851	12.185

An area of 1.79 hect of land will be degraded during the scheme period for mining and allied activities. At the end of the scheme period 1.046 Ha of area will come under plantation.

Similarly, a total of 8.312 Ha of land will be utilized for mining during conceptual period of the mine with present status of exploration.

The lessee has a plan to drill some boreholes in the area to prove the ore. After delineation of the ore body the limit of excavation will be certainly changed.



CHAPTER - V

5.0.0. MINING:

5.1.0. PRESENT MINING METHOD:

During the tenure of the last scheme period the mine has been closed on 15.02.2010 on per the instruction of the DFO, Banar, due to violation as per Para 4.4 of Guideline issued by MoEF, Govt. of India, as working in non-forest land violates FC Act 1980. The mine was temporarily closed, when IBM suspended mining operation on 25.08.2010 under Rule 13 (2) of MCDR 1986. Then the lessee submitted the modification to the approved scheme of mining and the suspension order was revoked by IBM on 11.03.11. Then the Dy Dir of Mines, Koira permitted mining operation on 15.10.2011. Again the operation was suspended by the Dy Dir of Mines, Koira on 26.11.11 due to want of Consent to Establish and Consent to Operate. After obtaining the Consent to Operate, the Dy Dir of Mines, Koira allowed mining operation on 19.02.2013. However, again the mine was suspended from 01.04.2013 due to want of approved scheme of mining.

Earlier the mining was carried out by semi-mechanised method of mining. Controlled deep hole blasting were practiced in the lease area. To avoid fly rocks plaster blasting were practiced using minimum charges. Small mono pumps were used to dispose of surface water in case of accumulation of water in the quarry floor. In course of mining five existing quarries are formed. The quarry wise position at the time of suspension of the mine are furnished below. The details of the existing quarries are as follows:

Quarry no.	Dimension	Top RL	Bottom RL	No of benches	No of OB benches	No of ore bench
Q-1	135m x 40m x 8m	595 mtr	586mtr	4	1	3
Q-2	75m x 12m x 7m	593 mtr	588 mtr	1	OB+ Ore	OB+ Ore
Q-3	45m x 40m x 4m	586 mtr	581 mtr	2	1	1
Q-4	65m x 15m x 2m	585 mtr	583 mtr	1	OB+ Ore	OB+ Ore
Q-5	110m x 35m x 2m	583 mtr	582 mtr	1	OB+ Ore	OB+ Ore

Out of five quarries three quarries namely Q-2, 3 & 4 are present in the DLC forest land & two quarries namely Q-1 & 5 are present in the non-forest area. In quarry-1 and quarry-3 safety zone area of 10 meter along village road and existing power line are found disturbed due to quarrying. Similarly, 7.5m safety zone along lease boundary has been



disturbed in Q-5. Excavations of safety zones in Q1, Q5 and Q3 have been made to the tune of 1500 m³, 97 m³ and 2560 m³ respectively. Major portion of the generated waste has been utilized by the lessee for making of roads and other required infrastructures. The remaining 877 m³ waste has been dumped that exists along the safety zone in between the pillars C and D. Top RL of the existing dump is 583 m and the bottom RL is 578m. The area is well accessed with mines road.

The existing land use pattern of forest & non forest area are as follows.

Categories	Area of present (Ha)
Area of excavation	0.40(Forest) + 1.07 (NF) = 1.47
Mineral Storage	0.163(non-forest)
O.B dump	0.135(non-forest)
Road	0.766(non-forest)
Infrastructure	0.011(non-forest)
Total	2.565

During various temporary closure, security guards have been employed for the watch and ward of the mine.

5.2.0. YEARWISE DEVELOPMENT PLAN FOR NEXT 5 YEARS (Up to 05.04.2018)

It is planned to develop the mine by small excavator and tippers for removal of overburden. In harder patches drilling and blasting will be done. This will be a semi-mechanized method of mining of OTFM-A category mine. Storing and sorting of ore will partly done by manual labors and partly through mobile crushing and screening plant. Before winning of ore, development of loose lateritic waste to the tune of 1 m to 2 m thickness is being undertaken.

During the present scheme (which is currently in force) mining activities will be confined to the existing Quarry -1 for iron ore which exists at the south-western part of lease area. It is observed that the safety zone area along village road has been disturbed in the process of mining. So it has been proposed to carryout mining in Q-1 leaving 10 meter safety zone area along village road. It has been proposed to develop the iron ore from the south eastern part of the existing quarry in the year 2013-14 which comes under non forest area



of the lease and will proceed laterally further in north direction till the end of 2014-15. At the end of 2014-15 the benches will proceed in western direction forward and laterally. Then in the year 2016-17 the benches will move to south direction to merge with the benches of 2013-14 and in the year 2017-18 the mining activities starts from the existing end of the benches of the 2015-16 and ultimately merge with the benches of 2016-17. During the ensuing scheme period the mine working will be confined to production of iron ore only. As the manganese quarry is present in the forest area and forest clearance is yet to be approved, no mining for manganese ore has been proposed. It has also been proposed to maintain the bench height and width of 6 meter and the haul road will be maintained at a gradient of 1: 16. Excavator of 0.9 m³ capacity with 10 tonne capacity dumper will be deployed for overburden removal. The blasted ROM will be sized and sorted partly through manual means and partly through mobile crushing and screening plant. The sorted ore will be loaded to tippers and dispatched to the desired destinations.

5.2.1. BRIEF DESCRIPTION OF PROPOSED DEVELOPMENT PLAN:

Development during 2013-14 (Ref. Plate – V)

During this year the proposed development will be carried in the virgin area of the lease which is situated at the southern most of the existing quarry-I leaving 10 meter safety zone along the village road. In course of mining total three nos. of benches will be developed one bench will be developed in overburden and two benches will be developed in the ore. The benches will be oriented in N-S direction.

Description	
Cross-section considered	9.9°
R.L. of the quarry floor at the end of year (m)	578
Height (m)	6
Width of the bench (m)	6
Over all slope of the quarry	45°
No. of benches	3

Summary:

Volume of total excavation (m ³)	15210
Volume of ROM (m ³)	
Production of saleable Iron Ore in (MT)	18564
Production of Non-saleable Iron Ore in (MT)	Nil
Volume of total waste (m ³)	9022
Shipping Ratio Ore to Waste(MT/m ³)	10.49



Development during 2014-15 (Ref. Plate – V)

The proposed development during this year is to be carried out in the existing quarry-1. In this year four nos. of benches will be formed. At the end of the year the bottom most bench will attain 572 mRL. The upper three benches will merge with the benches of same RL of previous year working. 10 meter safety zone along the village road at the eastern side of the working will be left out. All the benches will be developed in the non-forest area.

Description	
Cross-section considered	10-10'
R.L. of the quarry floor at the end of year (m)	572
Height (m)	6
Width of the bench (m)	6
Over all slope of the quarry	45°
No. of benches	4

Summary:

Volume of total excavation (m ³)	24221
Volume of ROM (m ³)	
Production of saleable Iron Ore in (MT)	46746
Production of Non-saleable Iron Ore in (MT)	Nil
Volume of total waste (m ³)	8639
Shipping Ratio Ore to Waste (MT/m ³)	1:0.18

Development during 2015-16 (Ref. Plate – V)

During the year all the four benches of previous year will be expand laterally and maintain the same RL. No new benches will be developed. All the benches will be carried out in ore zone only. No over burden will be removed during this year. 10 meter safety zone along the village road at the eastern side of the working also will be left out.

Description	
Cross-section considered	11-11'
R.L. of the quarry floor at the end of year (m)	572
Height (m)	6
Width of the bench (m)	6
Over all slope of the quarry	45°
No. of benches	4



Summary:

Volume of total excavation (m ³)	25685
Volume of ROM (m ³)	
Production of saleable Iron Ore in (MT)	49245
Production of Non-saleable Iron Ore in (MT)	NIL
Volume of total waste (m ³)	8085
Shipping Ratio Ore to Waste(MT/m ³)	1:0.16

Development during 2016-17 (Ref. Plate – V)

At the end of the year 2015-16 the existing quarry -1 will be fully developed with max four nos. of benches maintaining bottom RL 572 meter. The eastern side of the quarry will be left out up to 10 meter along village road due to safety zone. So it has been proposed to commence development by expanding the western side of the existing quarry from the first and second year working maintaining the quarry RL of respective bench. To achieve the required target production and to maintain the development in non forest area one new bench of 566 RL will be developed. Total 5 nos. of benches will be developed in both ore and overburden.

Description	
Cross-section considered	9-9', 10-10'
R.L. of the quarry floor at the end of year (m)	566
Height (m)	6
Width of the bench (m)	6
Over all slope of the quarry	45°
No. of benches	5

Summary:

Volume of total excavation (m ³)	20968
Volume of ROM (m ³)	14367
Production of saleable Iron Ore in (MT)	30171
Production of Non-saleable Iron Ore in (MT)	NIL
Volume of total waste (m ³)	10911
Shipping Ratio Ore to Waste(MT/m ³)	1:1.08



Development during 2017-18 (up to 05.04.2018) (Ref. Plate – V)

In the year 2017-18 development has been proposed in the non-forest area. The benches of 2015-16 will expand to fulfil the required production. Total 100 nos. of benches will be formed. The quarry RL will reach up to 566 mRL. Hence the benches will be oriented in N-S direction. The quarry development will be move from west to east.

Description	
Cross-section considered	11-11'
R.L. of the quarry floor at the end of year (m)	572
Height (m)	6
Width of the bench (m)	6
Over all slope of the quarry	45°
No. of benches	6

Summary:

Volume of total excavation (m ³)	8200
Volume of ROM (m ³)	7900
Production of saleable Iron Ore in (MT)	16590
Production of Non-saleable Iron Ore in (MT)	Nil
Volume of total waste (m ³)	2670
Stripping Ratio Ore to Waste (MT/m ³)	1:0.23

5.2.3. BASICS OF MINES PRODUCTION PROGRAMME:

QUANTITY OF DEVELOPMENT & PRODUCTION TONNAGE & STRIPPING RATIO OF IRON ORE:

YEAR	TOTAL EXCAVA- TION IN m³	OVER BURDEN IN m³	BOM				ORE TO WASTE RATIO MT/ m³
			CUT OFF GRADE/ HIGH GRADE ORE		SUB GRADE ORE	MINERAL REJECTS/INTE R BURDEN IN m³	
			IN m³	IN MT			
13-14	15210	6370	8188	18564	Nil	2652	1:0.49
14-15	24221	1961	15582	46746	Nil	6678	1:0.18
15-16	24500	1050	16415	49245	Nil	7035	1:0.16
16-17	20968	6601	10057	30171	Nil	4310	1:1.08
17-18 (Till 05.04.2018)	8200	800	5530	16590	Nil	2370	1:0.23
TOTAL	76817	16282	53772	161316		23045	1:0.24
Average	18620	3256	10754	32263		4609	

YEAR	CRASH	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r
2013	14	60-62	9-9'	136	65	2	578	8840	6188	18564	2652	98	6370	15210	9022	12631	1-0.49	
		Sub-Total		136				8840	6188	18564	2652	98	6370	15210	9022	12631	1-0.49	
2014	15	60-62		294				15582	10907	32722	4675	25	1325	16907	6005			
		58-60	10-10'	126	53	2	572	6678	4675	14024	2003	12	636	7314	2439	3695	1-0.19	
		Sub-Total		420				22260	15582	46746	6678	37	1961	24221	8444	12095	1-0.18	
2015	16	60-62	11-11'	469	90	4	572	23450	16413	49245	7035	21	1050	24500	8045	11319	1-0.16	
		Sub-Total		469				23450	16413	49245	7035	21	1050	24500	8045	11319	1-0.16	
2016	17	60-62	8-9'	71	61	2	578	4615	1211	9602	1385	51	3315	7930	4700	6579	1-0.48	
		60-62		96		3	584	5088	1562	10685	1526	62	3286	8374	6812	6737	1-0.45	
		58-60	10-10'	88	53	3	566	4664	1265	9794	1289	0	0	4664	1389	1959	1-0.14	
		Sub-Total		255				14367	10057	30171	4810	113	6601	20968	10911	15276	1-1.08	
2017	18	60-62	11-11'	158	50	4	572	7900	5530	16590	2370	6	300	8200	2670	3768	1-0.23	
		Sub-Total		158	50	4	572	7900	5530	16590	2370	6	300	8200	2670	3768	1-0.23	
Grand total								26817	51772	161316	23045	275	16282	93209	19327	35058	1-0.34	
								15361	10754	32283	6609		1256	18620	7865	11012		

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5.2.3 (a) EXTENT OF MECHANISATION

A system of semi-mechanisation shall be adopted in the mines in which excavation and loading of overburden/waste material being done by using hydraulic excavator. Rear dump trucks of 10 MT payload capacities shall be used for transport of ore and overburden/waste material. Wagon drill & shallow jock-hammer will be utilised to loose the iron ore formation. Deploying manual labour does sizing, sorting and stacking of ore for despatch.

5.2.4 Drilling

Drilling parameters for iron ore

Diameter of the blast hole	:	100mm
Height of the bench	:	8m
Sub-grade drilling	:	0.6m
Length of the hole	:	6.6m
Burden	:	2.5m
Spacing	:	3m
Volume of earth to be broken/loosen per hole,	:	$3.0\text{m} \times 2.5\text{m} \times 6.6\text{m} = 49.5$

Meterage of drilling per year

Max. Volume of excavation in a year 14700m^3 (60% of max. Vol. of excavation i.e. 24500m^3)

Number of holes to be drilled $14700\text{m}^3 / 49.5 = 296.96$ or 297 nos

Meterage of drilling to be required $297 \times 6.6 = 1960\text{m}$

Meterage of drilling per drill

Speed of the drill	:	8m/Hr
No of working days in a year	:	300
Efficiency	:	70%
Effective drilling hours per shift	:	5 hr
Meterage of drilling to be effected/year	:	$300 \times 8 \times 5 \times 70\% = 8400\text{ m}$



Required drills

Total meterage to be drilled/year

Number of drills required =

Total meterage to be drilled/year

Total meterage to be drilled in a
year/ drill

$1960\text{m}/8400\text{m} = 0.23$ say 1 no

5.2.5 Nos. of jack-hammers required

During the blasting there is more chance of boulder formation in the lease area. For the suitable fragmentation of the rock secondary blasting will be necessary. For the purpose of the secondary blasting purpose one jack hammer of capacity 25 kg will require.

5.2.6 Compressor requirement

Since one Jack-hammer consumes 2 to 2.5 Cum/min of compressed air, one compressor of 12 Cum/min capacity will be sufficient at the mine site to operate the said drills effectively.

5.2.7 Excavation and Loading

The waste generated during mining operation will be loaded into 10 T capacity tippers by using 0.9 m³ bucket capacity excavator.

Excavating parameters

Nominal bucket capacity	0.9m ³ (May be used higher capacity)
Bucket fill factor	0.9
Swell factor	0.75
Time cycle/pass	35 sec
Over all efficiency	65%
Seconds/ hour	3600
Number of working shifts	1
Hours/shift	8 Hr
Working days in a year	300 days



Rate of production

Out put/Excavator/hour	$0.9 \times 0.9 \times 0.75 \times 3600/35 = 62.48 \text{ m}^3 \text{ say } 62 \text{ m}^3$
Out put/Excavator/year	$62 \times 8 \times 300 \times 65\% = 96720 \text{ m}^3$

Number of excavator

Maximum handling of material required/year	24500m ³
No. of excavators required	$24500 \text{ m}^3 / 96720 \text{ m}^3 = 0.26 \text{ say } 1 \text{ no.}$

5.2.8 Haulage & Transportation

a) Haulage within the mining lease

The loaded waste in 10 T capacity tippers will be transported to the proposed dump. A total of three nos. of 10 tonne capacity tippers will be required to dump the generated waste.

The generated waste will be dispatched to the nearby proposed dump.

Annual rate of waste generated(max) = 10911 m³

Average daily rate of waste generated = $10911/300 = 37 \text{ m}^3$

Vol. of bucket of tipper = 6 m³

Required no. of trips/day = $37/6 \approx 6$

No of trips can be transported per tipper

Per day of one shift working = 6

No of tippers required per day = $6/6 = 1$

Standby to meet repair and

Maintenance time = 1

Total = $1+1=2 \text{ Nos.}$

b) From the mine head to destination

The Fe ore will be raised and stacked near the working benches. Rear dump trucks of 10 MT payload capacities will be loaded by excavators and sent to various consumer industries. Trucks will be hired for the purpose.



List of machinerles

Machines	Capacity	
Excavator	0.9m ³	1
Wagon drill	-	1
Rock Breaker attachment	-	1
Jack hammer	—	1
Air compressor	12 m ³ /min	1
Truck/tripper	10 MT	2
Mobile crushing & screening plant	50tph	1
Safety equipments as per DGMS specification		As necessary
Iron hammer, crowbar, basket, fork and spades as required		As necessary

5.2.9 Employment Potential

Mines Manager - 1 no. Full time (Degree in mining engg. With 2nd class Managers certificate of competency)

Geologist-1 no Full time (Msc in geology with 10 yrs experience)

Mining Foreman- 1no. (Diploma in mining engg. With foreman certificate of competency)

Mining Mate - 1 no. (Mate's Certificate)

Office Asst. - 2 no.

Driller-2nos.

Tipper driver-2nos

Helper-2 nos.

Operator- 2nos.

Raising & other misc. labour - 20 nos.

(Considering annual production 49000 MT, daily avg. Production comes to be 163mt.

Assuming 0.58 MT the number of raising labour will be 20)

Total = 20 Nos + 5 Absenteeism = 25 Nos



5.3.0 BLASTING:

A) Blasting Parameters:

In Oraghat Iron & Manganese Mines of Sayed Abdul Hafim, shot holes will be made for blasting to cope up with the production capability of individual labourers. There will be no definite spacing and burden pattern because of the bouldery nature of the ore body. However at the top bench 0.6m x 0.6x or 1.2m x 1.0m pattern will be followed and at the bottom bench holes will be made depending on the formation encountered. At places, to control the throw of rock and minimize ground vibrations muffle blasting will be practiced. All the holes will be blasted generally by safety fuse firing system. Drill holes are drilled in single rows as well as in multi row on staggered pattern by jack hammer as well as by DTH drills. However, drilling, blasting parameters are chosen as follows:

Sl. No.	Parameters		
1	Dia of the hole		100mm
2	Drilling pattern	Burden	2.5m
		Spacing	3m
3	Depth	Blasting in one stroke	5m
		Sub grade drilling	0.6m
		Hole depth	6.6m
4	Nature of the hole		vertical
5	Type of main explosive	Name	ANFO, Power gel
		Dia cartridge	83mm
6	Powder factor		5 t/Kg
7	Requirement of explosive	Quantity/hole	10Kg
		Quantity/single blast	50Kg
8	Initiative explosive	Detonator	ED
		Fuse	cordex
9	Type of blasting		Primary & secondary
10	Yield/hole		49.5m ³



B) Types of Explosives to be used:

For blasting in shallow holes, the applicant possesses the license for using high explosives of class III/Class II category. In addition to above, the applicant has license for manufacturing A.N.F.O. explosives at site. Because of erratic supply position of explosives, it has become necessary to have alternative arrangements of storage and use of different type of explosives. With the easier availability of Class II slurry explosives for small diameter holes and its possibility of use in cut cartridges forms after obtaining permission from D.G.M.S., Under regulation 155 of Metalliferous Mines Regulations, 1961, it has now become preferable to use such explosives in more quantity. Besides being safe in handling, class II explosives have got the added advantage of getting the desired fragmentation with less charge per hole thereby reducing the danger from fly rock fragments.

Type of explosives to be used and a typical charge pattern are given below:

Iron & Manganese Ores (For 1.2m depth)		
Special Gelatine		130 gms.
A.N.F.O. Mixture		130 gms.
Ordinary Detonator		1 no
Safety fuse		1.25 mtrs.
Iron & Manganese Ores (for 0.6m depth)		
Indomile/Superdyne		70 gms.
A.N.F.O. Mixture		70 gms.
Ordinary Detonator		1 nos.
Safety fuse		1.25 mtrs.

At Oraghat Iron & Manganese Mines for secure and safe storage of explosives, a permanent portable magazine will be provided. The site of magazine has been shown in Environment Management Plan Plate No.VII.



C) The capacity of the magazine will be as follows:

Class 2 or 3	100 Kgs.
Class 6 Division I	150 mts.
Class 6 Division III	100 Nos.

The magazine will be as per the design laid down in Indian Explosive Rules and safety distances will also be maintained as per the above rules. Drilling and Blasting will be carried out strictly as per the various provisions of MMR 1961 under the strict supervision of statutorily qualified persons.

For storage and issue of explosives, the relevant provisions of Indian Explosives Rules, 1983 will be followed. However village road, huffing have been observed in the vicinity of the lease area. So controlled blasting technique such as muffle blasting, use of delay detonators shall be adopted in the blasting.

As inhabitation sites are located nearby to the proposed working places it is proposed to use Rock Breaker as much as possible avoiding drilling and blasting.

CHAPTER --- VI



6.0 HANDLING OF WASTE/SUB-GRADE MINERALS

6.1 RATE OF YEARLY GENERATION OF WASTES AND PROPOSALS FOR DISPOSAL OF WASTE FOR NEXT FIVE YEARS

Laterite, lateritic-Soil, and ferruginous shale etc constitute over burden and inter burden materials of Oraghat Iron & Mn Ore mines.

Yearly generation of waste (interburden & over burden) is being given below.

Table - 6.1.1

Waste generated from iron quarry (Q-1)

YEAR	VOL. OF WASTE AS IB (m ³)	VOL. OF WASTE AS OB (m ³)	VOL. OF TOTAL WASTE (m ³)	SWELLED VOL. OF WASTE (m ³)
[1]	[2]	[3]	[4]	[5] = [4] x 1.4
2013-14	2652	6370	9022	12631
2014-15	6678	1961	8639	12095
2015-16	7035	1050	8085	11319
2016-17	4310	6601	10911	15276
2017-18	2370	300	2670	3738
Total	23045	16282	39327	55058

6.1.1 PROPOSED DUMP (YEARLY DEVELOPMENT)

During the ensuing scheme period mining activities will be confined in the iron quarry i.e Q1 only. A quantity of 39327 m³ vol. of waste (swell waste-55058m³) will be generated from the iron quarry in the ensuing scheme period. One dump exists over an area of 1350m² at the eastern side of the lease area accommodating 877 m³ waste, it has been proposed to dump the generated waste on dump-A at the earmarked site of the lease area. In the ensuing scheme period a total vol. of 39327 m³ waste will be generated. The waste generated from the quarry in the ensuing scheme period shall be accommodated in the dump-A. Dump A has been proposed at the site over plot 194 where the lessee possesses surface right. Safety zone areas in Q-3 & Q5 and safety zone along village road in Q1 are found to be disturbed due to mining. A total vol. of 4257m³ has been excavated from the safety zone of the above said quarries. So it has been proposed that the waste of existing dump of vol. 877m³ shall be rehandled during 2013-14 to backfill these disturbed



safety zones. The remaining required waste of vol. 3380 m³ shall be generated from the generated waste of mining operation for the same year.

The proposed dump A will be spreading over total area of 3910 m². Dump-A is proposed to be encircled by retaining wall and garland drain connected to settling tank. Dumping in Dump A will be advanced in western direction in retreating fashion. It is calculated that 55058 m³ of waste shall be generated in the scheme period from iron ore mining. Out of this 3380 m³ waste from 2013-14 will be utilised for backfilling purpose of disturbed safety zone area. Remaining 51678 m³ will be dumped on the dump-A. Dump-A will acquire 0.391 ha. Height of Dump - A is proposed at 20m with two terraces each of 10 m height. (Ref. Plate No. VII)

The Protective measures and precautions to be under taken for the waste dump the management shall be as follows:

- i) The ultimate dump slope will be maintained at 20°-22° with individual terrace slopes not exceeding 37°.
- ii) The individual terrace heights will be maintained at 10m.
- iii) Each terrace will have inward slope with catch drains at the inward side of the terrace.
- iv) The catch drains of the individual terrace will be connected to the garland drain outside the periphery of the dump.
- v) These catch drains will have half concrete open pipes followed by settling tanks to avoid wash offs.
- vi) Each terrace will also have a provision of berms at the outer end to reduce gully formation due to rain water wash offs.
- vii) The retaining wall has to be made to arrest the waste dump materials for consolidation.
- viii) Garland drains are to be paved around the dump to arrest possible wash off in rainy seasons.
- ix) Suitable grass/plant species will be paved in the dump slope, which will hold the materials in its fibrous and spread over roots to protect wash off in the rainy seasons.
- x) Plantations of grass and sapling will be done from the year 2013-14 onwards.

6.2 Generation of sub-grade

In case of iron ore depending upon the chemical composition of other batch materials, various steel plants utilize iron ore within certain limits and the Fe₂O₃ content of ore usually varies between 58%-65%. In the major industry this is the lowest grade of ore that is generally used and thus marketed and in general there is no market below this grade.



iron ore having Fe₂O₃ content in between 45 to 58% is not having any market but due to high content of Fe in comparison to general waste material, this ore is separately stocked as sub-grade ore with a view to have market in future or to be blended with high grade ore.

Although sub-grade ore exists in the leasehold as evidenced from Chapter III, there will be no production of sub-grade ore during the ensuing scheme period.

CHAPTER – VII



7.0 USE OF MINERAL

7.1. END USE OF IRON ORE

There is no change in the market policy for use of iron & Manganese ore so far as Oraghal mine is concerned. At present the iron ore is supplied to MMTC and pig / sponge iron plants, and other plants by the local traders in the domestic market.

7.2 CHANGES IN THE SPECIFICATION, IF ANY, IMPOSED BY THE USER INDUSTRIES AND / OR SPECIFICATIONS REQUIRED IN THE CASE OF NEW USER INDUSTRIES, IF ANY ,TO BE GIVEN

Specification imposed by user agency

a) Sponge iron:

Fe	$Al_2O_3 + SiO_2$	P	Moisture	LOI	Size
>58% - <62%	5%	0.05%	4% Maximum	3% maximum	5 to 18%

b) Steel plant:

Fe	$Al_2O_3 + SiO_2$	P	Moisture	LOI	Size
58% to 62%	5%	0.06%	4% Maximum	2% maximum	10 to 40 mm

CHANGE IN SPECIFICATIONS:

The Buyers specification on iron ore utilisation in sponge iron plant and steel plant are given in para 7.2. The grade of the iron ore produced from lease hold matches with the consumption characteristics of the sponge iron plant and steel plant. Therefore it is not required to change the specification of iron ore for supply to these industries from Oraghal iron ore mines.

7.3 EFFORTS MADE FOR UTILISATION OF THE SUB-GRADE MINERAL INCLUDING FINES

Iron ore containing less than 58% and more than 45% Fe has been considered as sub-grade. As such there will be no production of sub-grade ore in the ensuing scheme period as evidenced from the development table of Chapter V. If, any sub-grade is generated in due course of mining, shall be blended with high grade ore to be made saleable.



CHAPTER -VIII

8.1 MINERAL BENEFICIATION:

At present there is only a screening plant of 50 TPH capacity in the leasehold to screen the ore to different sizes. Lessee has a plan to install one mobile crushing plant of same capacity in near future.

The ore recovered during excavation constitutes about 70% iron ore. These recovered quantities after manual sorting are fed to the screening plant, for out put in the size range of 5mm to 40mm.

8.2 Quality of Ore:

For iron ore, it is proposed to install a crushing plant apart from the existing screening plant. The mechanical beneficiation plant will be installed in the lease hold. The feed size will vary from 10 mm to 100 mm. Generation of fines will be to the tune of 30% of the total feed after due crushing.

The physical and chemical characteristics of the R.O.M. iron ore to be supplied after crushing are given below:

<u>Constituents</u>		<u>Av. Product grade</u>
Fe	-	> 58% - < 62%
SiO ₂	-	< 4%
Al ₂ O ₃	-	< 5%
Feed size	-	- 400 mm.
Product size	-	Lump - 5 – 18mm, 10 – 40mm, Fines - less than 5mm.



CHAPTER - IX

9.0 ENVIRONMENTAL MANAGEMENT PLAN

SALIENT ITEM	PROPOSAL AS PER APPROVED SCHEME OF MINING	POSITION AT THE END OF 5 YEARS OF SCHEME OF MINING PERIOD	PROPOSAL IN THE ENSUING SCHEME PERIOD
(1)	(2)	(3)	(4)
Top soil storage, preservation and utilisation	There is no existence of top soil in the area, hence there is no proposal.	No topsoil was generated in the mining areas.	Since there is no generation of top soil, no proposal for preservation of the same is envisaged. One soil sample station is proposed as per EC in the buffer zone for soil analysis (Plate I).
Land reclamation and rehabilitation	Since all the pits are in mineralised zone and resource is yet to be established fully, no proposal has been envisaged. It was proposed that reclamation will start in the conceptual period. It was proposed in the modification to the approved mining scheme to backfill Quarry-5 as it is situated within the safety zone of the High power transmission line.	No reclamation has been done. Backfilling has not been taken up in Quarry-5 as the area is ore bearing. However, lessee is taking steps for shifting of the existing power line.	Since all the pits are in mineralised zone and resource is yet to be established fully, no proposal has been envisaged to reclaim any quarry in the ensuing scheme period.



Material Balance:

Proposed Average annual RDM production- 15363 m³

Production of ore- $15363 \times 70\% \times 3.0 = 32263$ MT (intercalated waste to the tune of 32263 MT shall be separated through hand picking)

Saleable ore (58-62% Fe) = 32263 MT

Amount of sub-grade ore(45 to <58% Fe) = Nil

Ore which will be subjected to crushing = 32263 MT

After screening- 70% shall be sized ore (5-18mm) = $32263 \times 70\% = 22584$ MT & Fines (0-5mm)= $32263 \times 30\% = 9679$ MT

Average Annual Final Output:

intercalated waste: 4609 m³ (Fe% <45%)

Sub-grade- Nil (Fe% - >45 to <58%)

Sized ore- 22584 MT (Fe% -58 to 65%)

Fines - 9679 MT (Fe% - 58 to 65%)



Waste dump management	A total quantity of 99534m ³ of waste from the iron quarry and 67294 m ³ from the manganese quarry was calculated to be generated which was supposed to be dumped in proposed dumpsite.	As the mine was closed due to lack of forest clearance no waste was generated.	One dump has been proposed on eastern side lease boundary to dump the waste generated from the iron quarry. The dump will acquire over an area of 0.391 ha. The dump will be encircled by retaining walls and gulland drains to prevent wash off from the dumps. A water gulland has been proposed along the village road to prevent rain water in to quarry.
Afforestation programme with precautions for survival & protection of plantation	3376 nos. of saplings were to be planted over 2.0 ha. within 5 years period.	No plantation was taken up as the mine was closed.	Total 1.046 ha of land will be subjected to plantations and 1702 nos. of saplings will be planted for the purpose. (year wise details is given below)

However in the ensuing scheme period the 10 meter safety zone area along the village road adjacent to Q1, 7.5 meter safety zone along the mine boundary of Quarry 3 and the safety zone of the existing powerline near Quarry 5 have been proposed for backfilling in the year 2013-14 and plantation has been proposed over backfilled area in the year 2014-15. The following table shows the backfilling and rehabilitation programme for the ensuing scheme period.



Year	Location	Area in m ²	Vol. of waste required in m ³	Notes
2013-14	10meter along village road of Q1 & 7.5 meter safety zone along mine boundary of Q3 & safety zone of the powerline Q5	1802	4257	Existing dump and waste from Q-1

The year wise program of tree plantation in safety zone is being given in below table:

Year	Area (m ²)	Type of saplings	No. of saplings	Distance between saplings (m x m)
2013 – 14	1687	Anacardium occidentale	306	2.5 x 2.5
2014-15	3902	Punica granatum	600	2.5 x 2.5
2015-16	2100	Psidium guajava	342	2.5 x 2.5
2016-17	1050	Mangifera indica	182	2.5 x 2.5
2017-18	1725	Ziziphus jujuba	272	2.5 x 2.5
Total	10464		1702	



SALIENT ITEM (1)	PROPOSAL AS PER APPROVED SCHEME OF MINING (2)	POSITION AT THE END OF 5 YEARS OF SCHEME OF MINING PERIOD (3)	PROPOSAL IN THE BASIC SCHEME PERIOD (4)
Quality & make of water including surface and ground water	No commitment was made in the approved scheme of Mining, as the area remains dry throughout the year except monsoon months. Hence, there was no chance of depletion of ground water. Mining activities have no effect on water quality.	No monitoring of water quality was done on regular basis. As no mining activity was carried out during the period, hence no impact on water quality. No effect on ground water.	To prevent wash off of fines from dumps, retaining wall, garland drain and settling tank will be provided to avoid pollution of perennial source of water around the dumps. In this scheme period in 2013-14 retaining wall of 135m x 3m x 3m and garland drain of 165m x 2m x 3m will be constructed around dump-A. Quarterly monitoring of water quality will be done and for the purpose, two water quality monitoring stations each in the core zone and buffer zone will be erected (Plate I). The slope of the area is from west to east. Therefore it is proposed to construct a garland drain along the western boundary of the leasehold not to allow the surface run-off of outside to enter the lease area from the western side. This retaining wall will be joined to another garland drain to drain the surface run off of the leasehold to Suga river. Ground water if discharged from the quarries and the collected surface water of the quarries will also be pumped out to this garland drain. For settling down the suspensions and to prevent the water from pollutants three settling tanks are also proposed to be made. This network of garland drain and settling tank would be constructed in 2014-15.



Noise level	No commitment was made in the approved scheme of Mining	No mining activity was envisaged, hence there was no Noise,	Regular monitoring of various potential impacts will be carried out. Quarterly monitoring of noise level will be done and for the purpose, five noise sampling stations in the core zone and 2 stations in the buffer zone are proposed (Plate I).
Vibration	No commitment was made in the approved Mining Plan.	No mining activity was envisaged, hence there was no Vibration.	Control blasting technique will be adopted by competent persons. Quarterly monitoring of air quality will be done and for the purpose, seven air sampling stations in the core zone and 2 stations in the buffer zone are proposed (Plate I).
Treatment of mine water and effluent / toxic substances before discharge	Settling tank has been proposed	No treatment is done as there is meagre production, hence less chance of contamination of water by toxic element.	Settling tank will be constructed for the purpose to prevent the water from pollutants.
Recirculation of treated water	Recirculation not required.	Not required	Not required

Construction of garland drains

Year	Location	Particulars and Size (Length x Breadth x Depth) in (m)
2013-14	Eastern part of the lease around dump-A	165 x 2 x 3
2014-15	Along western boundary of the lease area and joining this to Sung river (Plate VII)	800 x 2 x 2

Construction of retaining wall

Year	Location	Particulars and Size (Length x Breadth x Height) in (m)
2013-14	North-eastern part of the lease around dump-A	155 x 3 x 2



CHAPTER – X

10.0 ANY OTHER INFORMATION

10.1 CONSERVATION OF MINERAL

For conservation of minerals, scientific mining has been planned which will be adhered to in future. Separate waste dump yards have been marked for mining zone. These dumps have been proposed in places from where those can be rehandled for backfilling. As the quality of iron ore is of high grade variety total excavation does not pose a problem. The generation of non-marketable fine is also minimum. As there is clear cut difference between top over burden and ore, chances of mixing of overburden with ore is also less.

10.2 PROTECTION OF ENVIRONMENT

The mining has been planned in such a way that damage to forestry is less. In addition to this major scheme of compensatory afforestation has been proposed to neutralize the effect of trees that is likely to be affected by future workings.

CHAPTER - XI

11.0 PROGRESSIVE MINE CLOSURE PLAN

11.1 INTRODUCTION



Name of the lessee	Sayed Abdul Halim Barbil Basti At/Po: Barbil- 758035. Dist. Keonjhar (Odisha).
Location & extent of lease area	District and State - Sundergarh, Odisha Sub-division - Sonai Village - Oraghat Latitude: 21° 55' 45" N Longitude: 85°18' 45" E Lease area (Hectares): 25.847 Ha
Type of lease area (forest, non – forest etc.)	Non-forest –19.959 Hect Forest –5.888 Ha

Existing land – use pattern

Sl no	Pattern of Utilization	Total Area in Ha.
1	Mining	1.47
2	Dumping of O.B.	0.135
3	Roads,	0.786
4	Infrastructure	0.011
5	Mineral storage	0.163
	Total	2.565

Method of mining	Opencast mining by semi-mechanized cum manual methods Category-A, OTFM
Mineral processing operations	By crusher and screening plant



11.1.1 Reasons for closure:

Predictable:	The mineable reserve of iron ore is 963369 MT which will last for another 20 years @ 49245 MT per annum of production. The mineable reserve of manganese is 27540 MT and there is no proposal for mining of manganese ore. Hence, closure of the mine in the near future due to exhaustion of ore is ruled out.
Unpredictable:	Mining may close due to some natural calamities, accident, local issues or drastic fall in market demand or price.

Hence, closing of the mine as a whole does not arise at present

11.1.2 Statutory obligation:

This Progressive Mine Closure plan is submitted as is required under rule 23-B (2) of MCDR, 1988 for existing lease vide notification GSR 330(E) dated 10.04.2003

Legal obligation: Directives issued by IBM, condition imposed by Ministry of environment, forests, state or central pollution control board etc.

IBM – Copy of the approval letter of mining scheme is annexed vide Annexure No I

Pollution Control Board- The forest diversion proposal of above mine is under Process at office of D.F.O Bonai, Environmental clearance has already been obtained. The EC is subject to the approval of Forest clearance. Annexed vide Annexure No II.

11.1.3 Closure plan preparation:

Name of the lessee:	Sayed Abdul Halim
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Names & address of the recognized Qualified person who prepared the Mining Closure Plan:	Sri Chandrabhanu Das Geo consultants (p) LTD. 853, Gobind Prasad (Medical Lane) Mahaveer Nagar (in front of Radhika Complex/Reliance fresh) Laxmisagar, Bhubaneswar-751006 Phone - 0674-2575702, 9437019019 (m) Regn. No.: RGP/58S/052/2004/A
Name of the executing agency:	Closure plan will be implemented by the Lessee himself

11.2. Mine Description:

11.2.1 Geology:

Topography:

The Oraghat Iron & Mn ML area exhibits a gentle sloping topography. The ore body trends along NNE-SSW direction with a dip of 30° towards SE. The highest elevation of the area is 610 m, while the lowest elevation is 580m above mean sea level. The Sunda Nala flows along the eastern boundary of the leasehold. There are no prominent drainage features within the leasehold. The area slopes towards SE.

Local Geology:

The Oraghat Iron & Mn Mines of Sri Sayed Abdul Halim forms a part of pre-cambrian Sedimentary formation forming the western limb of the famous horseshoe shaped synclinorium comprising of iron ore group of rocks of pre-cambrian age of Jamda - Kaira valley. The Special distribution of the iron ore deposits and occurrences of manganese ore broadly confirm to the major structure. This observation together with the fact that manganese is restricted in its occurrence to either the variegated shale or the laterite derived from the shale, bears out that there is a distinct stratigraphic control in the manganese mineralisation. physiographically the manganese ore deposits are restricted, in general to the relatively, low level plateau covered by laterite in contrast to the iron ore deposits which are found in different levels mostly at higher altitudes. It is



possible that the lateritic manganese ores are the manifestation of a secondary process of erosion and cauterization.

The iron ore located at this area is considered to be of secondary origin. They are formed by desilicification of primary BHQ/BHU rocks, which are called protore.

STRUCTURE

The lease area is situated at the eastern limb of the horse-shoe shaped syncline. The body strikes in E-W direction with dip southerly. This limb is structurally more disturbed and folds of micro and mega scale are very common. Faults of major scale are rarely seen. Joints are numerous and developed due to competency of the rock.

11.2.2 Reserve:

Classification	Code	Iron ore in MT	Mn ore in MT
Total Mineral Resources (A+B)		2040997	43042
A. Mineral Reserves			
(1) Proved Mineral Reserves	11	584592 (Fe% 58-62)	
(2) Probable Mineral Reserves	12	0	
Probable Mineral Reserves	122	223830 (Fe% 58-62)	
B. Remaining Resources			
(1) Feasibility Mineral Resources	21		
(2) Prefeasibility Mineral Resources	22	231299 (Fe% 58-62) + 151231 (Blocked) (Fe% 58-62) + 150259 (SG Fe% 55-58) = 532789	12900 (Mn % 20-30)
Prefeasibility Mineral Resources	222	210459 (Fe% 58-62) + 145343 (Blocked) (Fe% 58-62) + 2688 (SG Fe% 55-58) = 358490	13612 (Mn % 20-30)
(3) Measured Mineral Resources	33		
(4) Indicated Mineral Resources	332		
(5) Inferred Mineral Resources	333	359096 (Fe% 55-62)	13530 (Mn % 20-30)
(6) Reconnaissance Mineral Resources	334		

Demonstrated mineable reserve of iron ore - 963388 Mt

Demonstrated mineable reserve of iron ore - Nil

Grade of Iron Ore:

As revealed from analysis of borehole samples the grade of iron ore



(b) Iron Ore

Fe	-	-	>58% - <62%
Sio ₂	-	-	<4%
Al ₂ O ₃	-	-	<5%

Grade of Manganese Ore:

The mine is temporarily closed and the manganese ore zone is in the forest patch. Therefore, it was not possible to analyse manganese samples. However, as per earlier analysis, grade of Mn ore is as below:

Manganese Ore

Mn	-	-	Around 30%
Fe	-	-	15% (Max)
Al ₂ O ₃	-	-	<7% (acceptable up to 8%)
Sio ₂	-	-	13% (Max)
P	-	-	0.15% (Max)

11.2.3 a) Mining Method:

Semi-mechanized method of mining will be followed during the ensuing 5 years of development. It is planned to develop the mine by introduction of small excavator and tippers for removal of overburden. The method of mining shall be opencast semi mechanized method of mining under category-A OTFM

The mine is developed by removing first 1.0 to 2.00 meters of loose laterite with lateritic soil. Thereafter the benches are formed with the ground maintaining the height and width of 6 meter each.

Year wise production

YEAR	TOTAL EXCAVATION IN m³	OVER BURDEN IN m³	ROM				ORE TO WASTE RATIO MT/ m³
			CUT OFF GRADE/ HIGH GRADE ORE		SUB GRADE ORE	MINERAL REJECTS/INTER BURDEN IN m³	
			IN m³	IN MT			
13-14	15210	6170	6188	18564	NR	2652	1:0.49
14-15	24221	1961	15582	46746	NR	6678	1:0.18
15-16	24500	1050	16415	49245	NR	7035	1:0.16
16-17	20968	6601	10057	30171	NR	4310	1:1.08
17-18 (Till 05.04.2018)	8200	300	5530	16590	NR	2170	1:0.23
TOTAL	76817	14282	53772	161316		23045	1:0.24
Average	18420	3256	10754	32263		4609	



b) Mineral Beneficiation:

There exists a screening plant of 50TPH within the leasehold and the lessee will install a crushing plant of equivalent capacity in the near future.

11.3. Review of implementation of Mining plan / scheme of mining including five years progressive closure plan upto final closure plan:

The scheme of mining was approved for the period of five years from 2008-09 to 2012-13. The following commitments were made in the PMCP and the actual achievements during the period are as follows.

(i) Construction of garland drain:

Proposal:

Year	Location	Particulars and Size (Length x Breadth x Depth) in (m)
2008-09	Eastern part of the lease around dump-A&B	800 x 2 x 3

Achievement: No garland drain has been made.

Reason for deviation: This is due to non-continuous small scale intermittent mining operation for very brief periods due to want of forest clearance and Environmental clearance for which regular dump as proposed has not been prepared and hence no garland drain.

(ii) Construction of retaining wall around the Dump:

Proposal:

Year	Location	Particulars and Size (Length x Breadth x Height) in (m)
2008-09	North-eastern part of the lease around dump-A & B	760 x 3 x 2

Achievement: Retaining wall has not been constructed.

Reason for deviation: This is due to non-continuous small scale intermittent mining operation for very brief periods due to want of forest clearance and Environmental clearance for which regular dump as proposed has not been prepared and hence no retaining wall.



III) Afforestation:

As no quarry was to be exhausted in the last PMCP period, plantation was proposed in safety zone area as below.

The year wise program of tree plantation on the dump slope is given below.

Year	Area (m ²)	Type of saplings	No. of saplings	Distance between saplings (m x m)
2008 - 09	-	Anacardium occidentale		2.5 x 2.5
		Ziziphus jujuba		2.5 x 2.5
2009-10	-	Punica granatum		2.5 x 2.5
		Psidium guajava		2.5 x 2.5
		Mangifera indica		2.5 x 2.5
2010-11	300	Psidium guajava	63	2.5 x 2.5
2011-12	400	Mangifera indica	80	2.5 x 2.5
2012-13	400	Ziziphus jujuba	80	2.5 x 2.5
Total	1100		223	

Achievement: No plantation has been taken up within the lease area.

Reason for deviation: This is due to non-continuous small scale intermittent mining operation for very brief periods due to want of forest clearance and Environmental clearance.

(II) Environmental aspects:

It was proposed for regular monitoring of air, water and noise within the lease area and the buffer zone. However monitoring has not been done after 2010 as the mine is temporarily closed due to want of statutory clearances.

11.4 CLOSURE PLAN

11.4.1 Mined out land:

Below table depicts the post mining land use pattern.

Categories	Area of present (Ha)	Area during scheme period (Ha)	Total Area (Ha)	Area of the conceptual period (Ha)
Area to be excavated for mining	1.47	0.32	1.79	8.312
Mineral Storage	0.163	0.382	0.545	Nil
O.B dump	0.135	0.391	0.526	Nil
Road	0.786	0.110	0.896	Nil
Infrastructure	0.011	Nil	0.011	Nil
Magazine	Nil	0.037	0.037	Nil
Green belt	Nil	1.046	1.046	3.8735
Total	2.565	2.286	4.851	12.185



An area of 1.79 hecta of land will be degraded during the scheme period for mining and allied activities. At the end of the scheme period 1.046 Ha of area will come under plantation.

Similarly, a total of 8.312 Ha of land will be utilized for mining during conceptual period of the mine with present status of exploration.

The lessee has a plan to drill some boreholes in the area to prove the ore. After delineation of the ore body the limit of excavation will be certainly changed.

Year wise excavation area

Year	Quarry no	Mined out area at the beginning (m ²)	Addition of area proposed during the year (m ²)	Total area (m ²)	Area reclaimed and rehabilitated during the year (m ²)	Mined out area at the end of the year (m ²)
2013 - 14	Quarry -1	14700	600	15300	Nil	15300
2014 -15	Quarry -1	15300	Nil		Nil	15300
2015 - 16	Quarry -1	15300	Nil		Nil	15300
2016 - 17	Quarry -1	15300	1800		Nil	17100
2017 - 18	Quarry -1	17100	800		Nil	17900

However in the ensuing scheme period the 10 meter along safety zone area of village road of Q1 and 7.5 meter along safety zone area of mine boundary have been proposed for backfilling in the year 2013-14 and plantation has been proposed over backfilled area in the year 2014-15. The following table shows the backfilling and rehabilitation programme of the ensuing scheme period.

Year	Location	Area in m ²	Vol. of waste required in m ³	Waste to be utilized from
2013/14	10meter along village road of Q1, 7.5 meter along mine boundary of Q 3 & safety zone of powerline near Q5	1802	4257	Existing dump and waste from Q-1



11.4.2 Water Quality Management:

Oraghal Iron & Mn Ore Mines is topographically a small-undulated hill with contour difference of only 30 mts with gentle slope. The Suna river flows at the eastern boundary of the leasehold. The Nala water is used only for mining activity and for drinking purpose the nearest tube well is used. Garland drain has been proposed around the dumps to check the water pollution by dump washing and the water from dump will flow through the settling tank before it is discharged to the nala, thus allowing fresh and non-pollute water to pass through the river course.

Construction of garland drains

Year	Location	Particulars and Size (Length x Breadth x Depth) in (m)
2013-14	Eastern part of the lease around dump-A	165 x 2 x 3
2014-15	Along western boundary of the lease area and joining this to Suna river [Plate VII]	800 x 2 x 2

Construction of retaining wall

Year	Location	Particulars and Size (Length x Breadth x Height) in (m)
2013-14	North-eastern part of the lease around dump-A	155 x 3 x 2

Quarterly monitoring of water quality will be done and for the purpose, two water quality monitoring stations each in the core zone and buffer zone will be erected (Plate I).

11.4.3 Air Quality Management:

As the mining will be carried out by semi mechanized method and few dumpers engaged for transporting of ore & dumping of waste material there is minimum dust generated and it is proposed to use water sprinkler to check the dust pollution. However, 1636 no. of plants are to be planted in the next five years period which is explained in the present mining scheme.



Quarterly monitoring of air quality will be done and for the purpose, several air sampling stations in the core zone and 2 stations in the buffer zone will be established. (Photo)

11.4.4 Waste Management:

The over burden and waste materials of oraghat Iron & Mn Ore mines are associated with laterite, lateritic-Soil, and ferruginous shale etc. During next five years waste

Year	Dump. No.	Nature of Dump	Area of the beginning of the year(m ²)	Additional area during the year(m ²)	Total	Area rehabilitated during the year(m ²)	Balance area of the end of the year
13-14	Dump-A	O.B+L.S	1350	770	2120	Nil	2120
14-15			2120	1088	3208	Nil	3208
15-16			3208	2052	5260	Nil	5260
16-17			5260	Nil	5260	Nil	5260
17-18			5260	Nil	5260	Nil	5260

materials shall be dumped separately which is shown in dump plan of prepared mining scheme.

During the ensuing scheme period mining activities will be confined in the iron quarry i.e Q1 only. A quantity of 39327 m³ vol. of waste (swell waste-55058m³) will be generated from the iron quarry in the ensuing scheme period. One dump exists over an area of 1350m² at the eastern side of the lease area accommodating 877 m³ waste. It has been proposed to dump the generated waste on dump-A at the earmarked sites of the lease area. In the ensuing scheme period a total vol. of 39327 m³ waste will be generated. The waste generated from the quarry in the ensuing scheme period shall be accommodated in the dump-A. Dump A has been proposed at the site over plot 194 where the lessee possesses surface right. Safety zone areas in Q-3 & Q5 and safety zone along village road in Q1 are found to be disturbed due to mining. A total vol. of 4257m³ has been excavated from the safety zone of the above said quarries. So it has been proposed that the waste of existing dump of vol. 877m³ shall be rehandled during 2013-14 to backfill these disturbed safety zones. The remaining required waste of vol. 3380 m³ shall be procured from the generated waste of mining operation for the same year.



The proposed dump A will be spreading over total area of 3910 m². Dump A is proposed to be encircled by retaining wall and garland drain connected to settling tank. Dump A will be advanced in western direction in retreating fashion. It is estimated that 55056 m³ of waste shall be generated in the scheme period from iron ore mining. Out of this 3380 m³ waste from 2013-14 will be utilised for backfilling purpose of disturbed safety zone area. Remaining 51676 m³ will be dumped on the dump-A. Dump-A will acquire 0.391 ha. Height of Dump - A is proposed of 20m with two terraces each of 10 m height.

The Protective measures and precautions to be under taken for the waste dump the management shall be as follows:

- i) The ultimate dump slope will be maintained at 20°-22° with individual terraces slopes not exceeding 37°.
- ii) The individual terrace heights will be maintained at 10m.
- iii) Each terrace will have inward slope with catch drains at the inward side of the terrace.
- iv) The catch drains of the individual terrace will be connected to the garland drain outside the periphery of the dump.
- v) These catch drains will have half concrete open pipes followed by settling tanks to avoid wash offs.
- vi) Each terrace will also have a provision of berms at the outer end to reduce gully formation due to rain water wash offs.
- vii) The retaining wall has to be made to arrest the waste dump materials for consolidation.
- viii) Garland drains are to be paved around the dump to arrest possible wash off in rainy seasons.
- ix) Suitable grass/plant species will be paved in the dump slope, which will hold the materials in its fibrous and spread over roots to protect wash off in the rainy seasons.
- x) Plantations of grass and sapling will be done from the year 2013-14 onwards.

Construction of retaining wall

Year	Location	Particulars and Size (Length x Breadth x Height) in (m)
2013-14	North-eastern part of the lease around dump-A	155 x3 x2

Construction of garland drains

Year	Location	Particulars and Size (Length x Breadth x Depth) in (m)
2013-14	Eastern part of the lease ground dump-A	165 x 2 x 3
2014-15	Along western boundary of the lease area and joining this to Suna river (Plate VII)	800 x 2 x 2



11.4.5 Top Soil Management – As there is no topsoil within this leasehold soil management is necessary.

One soil sample station is proposed as per EC in the buffer zone for soil analysis (Plate I).

11.4.6 Tailing dam Management – Not applicable.

11.4.7 Infrastructure:

Within the lease hold of Oraghat Iron & Manganese Ore Mines “Mine haulage Road” is the only infrastructure to connect all the quarries within the leasehold outcides. As there is no chance of any closure in near future all these roads will be very much active. In distant future when the mine will be closed, these roads will be utilized for generating final phase plantation on them.

11.4.8 Disposal of Mining Machinery:

At present, there are no machineries utilized within this leasehold area excluding the screening plant, which is explained in chapter -V. During the next five years machines shall be utilized for mining and allied activities. After final closure these machines either will be auctioned or shifted to other mining areas.

11.4.9 Safety and Security:

Oraghat Iron & Manganese Ore Mine is a small-undulated hillock. All the quarries are also open cast for this reason there is no such surface opening is required here to access in the quarry as underground pit. At present there is no chance of abandonment of any quarries. In distant future, when the mine will be closed after the completion of any type



of mining operation, all the quarries will be back filled to get back the original condition. As a result all the quarries will be safe and secured from any danger. Also it is proposed to make plantation at the sides of the road.

11.4.10 Disaster Management and Risk Assessment:

Geological and climatic hazards such as landslide, subsidence and inundation is not expected as because the working is by opencast mining.

Although earthquake was felt several times in Odisha, this part of the state has remained unaffected.

Flood due to river action is not expected to higher surface relief of the area.

Small scale fire is possible, which can be tackled by fire extinguishers.

11.4.11 Care & Maintenance during temporary discontinuance:

Temporary discontinuance of mining may happen due to below causes:

- Court order
- Natural calamities
- Mine related accident
- Slope failure
- Failure in fulfillment of statutory requirement
- Local issues, or
- Any other unforeseen circumstances

During temporary discontinuance, the following measures can be undertaken partly/fully depending upon the causes:

- Intimation to local mine & legal administrative authorities regarding the discontinuance
- Lifting of machines and materials
- Care and maintenance of machineries
- Tightening of security to keep the machine and materials safe and secured
- Preparation of plans and sections at the time of discontinuance
- Repair and maintenance of haul roads
- Regular monitoring of air, water, noise etc in the permitted zones.



11.5 Economic Repercussion of closure of mine and man power retrenchment:

11.5.1 Number local residents employed in the mines, Status of continuous family occupation and scope of joining the occupation back:

During next five years of mining operation total 25 local people will work as unskilled worker within the leasehold. At present there is no chance of abandonment of the mines. For this reason there is no chance of any retrenchment of the any worker of the mine in near future.

11.5.2 Compensation given or to be given to the employees connecting with sustains of himself and their family members:

During the coming five years as there will be no final closure of the mines, in case of temporary closures employees will be retained by the lessee excepting the unskilled labourers who finds alternative assignment in the neighbouring mines.

11.5.3 Satellite occupation connected to mining industry – member of person engaged there in continuance of such business after mine closes:

As the mine situated in a remote, hilly terrain one satellite occupation exists within leasehold. At present there is little chance of final closure of this mine. Hence, there will be no effect of closure on Satellite occupations connected to mining industry.

11.5.4 Continued engagement of employees in the rehabilitated status of mining lease and any other activities:

Not applicable as there is little chance of final closure of this mine in the next five years.

11.5.5 Envisaged repercussions on the expectation of the society around due to closure of mine:

Not applicable as there is little chance of final closure of this mine in the next five years.

11.6 TIME SCHEDULING FOR ABANDONMENT:

11.6.1 Reclamation & rehabilitation of mine-out land

As there is no plan for reclamation of mined out land in the coming five years hence the question of such does not arise.



11.6.2 Measure to be taken for protection of water bodies available in the mine area including control of erosion, sedimentation and siltation, water treatment, diversion of water courses, protection of contamination of ground water from leaching material and of acid mine drainage etc –

Not applicable.

11.6.3 Corrective measures taken for prevention of pollution of air quality:

To control air pollution, preventions and measures has been taken near the inhabited site and workers hutting.

11.6.4 Disposal of waste material and protective measures to be taken from generation of air, water and land pollutants while handling of waste material:

Protective measures to be undertaken after cessation of mining activities are:

- Plantation will be taken up around the excavated land, which will take at-least eighteen months for completion.

11.6.5 Management of top-soil and protective measures to be taken:

Not applicable in the scheme period.

11.6.6 Protection and stabilization of tailing dam frequency of desilting of tailing material protective measures to be taken for prevention of water bodies:

Not applicable.

11.6.7 Decommissioning, dismantling and disposal of various infrastructure facilities:

Not applicable.

11.6.8 Decommissioning of mining machineries:

Not applicable, as there will be no decommissioning in the near future.

11.6.9 Safety measures to be implemented to prevent access to surface opening, excavations:

The main quarry will be fenced.

11.6.10 Measures of care, maintenance and monitoring of status of unplanned discontinued mining operations:

Not applicable.

11.7 Abandonment Cost:

11.7.1 Decommissioning / Demolition	:2,00,000/-
11.7.2 Removal of infrastructure	:Rs 1,00,000/-
11.7.3 Removal of equipments and heavy machineries	:Rs 1,00,000/-



- 11.7.4 Site safety Not applicable
- 11.7.5 Remediation / Mitigation measures:
- 11.7.6 Construction of check dam Rs 1,00,000/-
- 11.7.7 Providing gariand drain: Rs 4,00,000/-
- 11.7.8 Total amount required under - Rs 9,00,000/-
- 11.7.9 Standard cost norm for enrichment of plantation per hectare is as under:
- 11.7.10 Pre-planting and nursery:

Sl No	1600 plants per Ha	Wage rate Rs 200/-	
		Man days required.	Amount (Rs)
1	Site preparation	5	1000
2	Alignment & stocking	4	800
3	Cost of stocking materials	Lump-sum	1400
4	Nursery cost of 400 seedling @Rs 5.00	-	2000
5	Fitting	10	2000
Sub-total			7200

11.7.11 Creation and maintenance

1	Carriage and planting	10	2000
2	Weeding, soil working and manuring (thrice)	18	3600
3	Application of insecticides (thrice)	3	600
4	Freeline tracing inspection path	4	800
5	Cost of fertilizer and insecticides	Lump-sum	1500
6	Watch and ward	30	6000
Sub-total			14500
Grand total			21700

11.7.12 Reclamation and rehabilitation of workings

11.7.12.1	Total waste required to be rehandled	436395 m ³
11.7.12.2	Cost required for rehandling /backfilling @ Rs 65/- per m ³	436395 x 65= Rs 283.7 lakh
11.7.12.3	Cost required for leveling and compaction of 8.312 Hect of mined out area @ Rs 200000/- per Hect	8.312 ha x200000= Rs 16.6 lakh
11.7.12.4	Cost required for rehabilitation by way of vegetation in backfilled area over 8.312 Hect @ Rs 21700/- per Hect [Ref 7.5.4.2]	21700 x 8.312 ha =Rs 1.8 lakh-
11.7.12.5	Total amount required for reclamation and rehabilitation	302 lakh



11.7.12.6 Maintenance / Monitoring during and after closure operation
Rs 2,00,000/-

Retrenchment and relocation cost: Not applicable.

11.7.12.7 Research and development: Not applicable.

11.7.12.8 Administrative / management:

11.7.12.9 Fees for preparation of Final mine closure plan along with collection of data;
Rs 2,00,000/-

11.7.12.10 salary and wages of supervisory personnel for monitoring closure activities
for two years- Rs 2,88,000/- @ Rs 12,000/- per month.

11.7.12.11 Total- Rs 6,88,000/- or 7 lakh

Grand total cost for abandonment is (Ref 11.7.2, 11.7.3, 11.7.8, 11.7.12.5 & 11.7.12.11) =
318 lakh

*Calculation is based upon the present status of exploration, which is subject to change
by detail proving of the ore body.

*Value of price may change in future which will have the impact on the estimate.



PROPOSAL FOR ITEM NO. 6 & 7 OF FMCP FOR THE YEAR 2013-14

ITEMS	DETAILS	AREA (HECT.) PROPO- SED	QUAN- TITY PROPO- SED	EXPENDITURE (Rs.) PROPO-SED	REMARKS
(A) RECLAMATION & REHABILITATION OF MINES OUT OF AREA	(i) Reforestation	0.1803	4732 m ²	300000/-	
	(ii) Afforestation on the backfilled area	Nil	Nil	Nil	
	(iii) Others (please specify) e.g. Afforestation on exhausted benches	Nil	Nil	Nil	
	(iv) pisciculture	Nil	Nil	Nil	
	(v) Covering into water reservoir	Nil	Nil	Nil	
	(vi) Picnic Spot	Nil	Nil	Nil	
(B) STABILISATION & REHABILITATION OF DUMPS (with Lease)	(i) Terracing	1 No	-	50000	
	(ii) Piling	-	-	-	
	(iii) Construction of Parapet wall/Retaining wall at toe of dumps	155m	1no	100000	
	(iv) Construction of Check Dams along slope of valley etc.	-	-	-	
	(v) Construction of Settling Ponds (Gorland drains etc.)	145m	1no	100000	
	(vi) construction of settling ponds, Channels	10m x 5m x 5m	1 No	1,00,000	
	(vii) Afforestation of dumps	-	-	-	
	(viii) Others (Please specify)				
(C) REHABILITATION OF BARREN AREA WITHIN LEASE	(i) Afforestation (green belt building)	0.148	304 nos	20000	
	(ii) Others (Please specify)	-	-	-	
(D) ENVIRONMENTAL MONITORING (core zone)	(i) Ambient air quality	-	2	50000	Core zone
	(ii) Water Quality	-	2	40000	Core zone
	(iii) Noise Level Survey	-	5	50000	Core zone
	(iv) Ground Vibration	-	-	-	-
	(v) Others Soil	-	-	-	-
(D) ENVIRONMENTAL MONITORING (buffer zone)	(i) Ambient air quality	-	2	40000	-
	(ii) Water Quality	-	2	40000	-
	(iii) Noise Level Survey	-	2	40000	-
	(iv) Ground Vibration	-	-	-	-
	(v) Others Soil	-	1	30000	-
	TOTAL	1.5134		750000	



PROPOSAL FOR ITEM NO. 6 & 7 OF PMCP FOR THE YEAR 2014-15

ITEMS	DETAILS	AREA (HECT.) PROPO- SED	QUAN- TITY PROPO- SED	EXPENDITURE (Rs.) PROPO-SED	REMARKS
(A) RECLAMATION & REHABILITATION OF MINES OUT OF LEASE AREA	(i) Backfilling	-	-	-	
	(ii) Afforestation on the backfilled area	NH	NH	NH	
	(iii) Others (please specify) e.g. Afforestation on exhausted benches	NH	NH	NH	
	(iv) pisciculture	NH	NH	NH	
	(v) Covering into water reservoir	NH	NH	NH	
	(vi) Picnic Spot	NH	NH	NH	
(B) STABILISATION & REHABILITATION OF DUMPS (with Lease)	(i) Terracing	0.1975	-	50000	
	(ii) Piling	-	-	-	
	(iii) Construction of Parapet wall/Retaining wall at toe of dumps	-	-	-	
	(iv) Construction of Check Dams along slope of valley etc.	-	-	-	
	(v) Construction of Settling Ponds (Galland drains etc.)	800m	1no	300000	
	(vi) construction of settling ponds, Channels	10m x 5m x 5m	2 No	2,00,000	
	(vii) Afforestation of dumps	-	-	-	
	(viii) Others (Please specify)				
(C) REHABILITATION OF BARREN AREA WITHIN LEASE	(i) Afforestation (green belt building)	0.38	800 nos	50000	
	(ii) Others (Please specify)	-	-	-	
(D) ENVIRONMENTAL MONITORING (core zone)	(i) Ambient air quality	-	7	50000	Core zone
	(ii) Water Quality	-	2	40000	Core zone
	(iii) Noise Level Survey	-	5	50000	Core zone
	(iv) Ground Vibration	-	-	-	-
	(v) Other Soil	-	-	-	-
(E) ENVIRONMENTAL MONITORING (buffer zone)	(i) Ambient air quality	-	2	40000	-
	(ii) Water Quality	-	2	40000	-
	(iii) Noise Level Survey	-	2	40000	-
	(iv) Ground Vibration	-	-	-	-
	(v) Other Soil	-	1	20000	-
TOTAL		0.8144		680000	


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PROPOSAL FOR ITEM NO. 6 & 7 OF PMCP FOR THE YEAR 2015-16



ITEMS	DETAILS	AREA (HECT.) PROPO- SED	QUAN- TITY PROPO- SED	EXPENDITURE (Rs.) PROPO-SED	REMARKS
(A) RECLAMATI ON & REHABILIT ON OF MINES OUT LET AND AREA	(i) Backfilling	-	-	-	
	(ii) Afforestation on the backfilled area	Nil	Nil	Nil	
	(iii) Other (please specify) e.g. Afforestation on exhausted benches	Nil	Nil	Nil	
	(iv) pisciculture	Nil	Nil	Nil	
	(v) Covering into water reservoir	Nil	Nil	Nil	
	(vi) Picnic Spot	Nil	Nil	Nil	
(B) STABILISATI ON & REHABILIT ON OF DUMPS (with Sease)	(i) Terracing	0.1125	11520	10000	
	(ii) Piling	-	-	-	
	(iii) Construction of Parapet wall/Retaining wall at toe of dump	-	-	-	
	(iv) Construction of Check Dams along slope of valleys etc.	-	-	-	
	(v) Construction of Settling Ponds (Goland drains etc.)	-	-	-	
	(vi) construction of settling ponds, Channels	-	-	-	
	(vii) Afforestation of dumps	-	-	-	
	(viii) Other (Please specify)	-	-	-	
(C) REHABI- LATION OF BARREN AREA WITHIN LEASE	(i) Afforestation (green belt building)	0.21	34200	20000	Safety zone
	(ii) Other (Please specify)	-	-	-	
(D) ENVIRO NMENTAL MONITORIN G (core zone)	(i) Ambient air quality	-	1	50000	Core zone
	(ii) Water Quality	-	2	40000	Core zone
	(iii) Noise Level Survey	-	3	50000	Core zone
	(iv) Ground Vibration	-	-	-	-
	(v) Other Soil	-	-	-	-
(D) ENVIRO NMENTAL MONITORIN G (buffer zone)	(i) Ambient air quality	-	2	40000	-
	(ii) Water Quality	-	2	40000	-
	(iii) Noise Level Survey	-	2	40000	-
	(iv) Ground Vibration	-	-	-	-
	(v) Other Soil	-	1	30000	-
TOTAL		0.8294		300000	

PROPOSAL FOR ITEM NO. 6 & 7 OF PMCP FOR THE YEAR 2016-17



ITEMS	DETAILS	AREA (HECT.) PROPO- SED	QUAN- TITY PROPO- SED	EXPENDITURE (Rs.) PROPO-SED	REMARKS
(A) RECLAMATI ON & REHABILIT ATION OF MINES OUT LET AND AREA	(i) Backfilling	-	-	-	
	(ii) Afforestation on the backfilled area	Nil	Nil	Nil	
	(iii) Others (please specify) e.g. Afforestation on exhausted benches	Nil	Nil	Nil	
	(iv) pisciculture	Nil	Nil	Nil	
	(v) Covering into water reservoir	Nil	Nil	Nil	
	(vi) Picnic spot	Nil	Nil	Nil	
	(vii) Others				
(B) STABILISATI ON & REHABILITATI ON OF DUMPS (with Sease)	(i) Terracing	0.2044	58247m ²	100000	
	(ii) Piling	-	-	-	
	(iii) Construction of Parapet wall/Retaining wall at toe of dump	-	-	-	
	(iv) Construction of Check Dams along slope of valley etc.	-	-	-	
	(v) Construction of Settling Ponds (Gorand drains etc.)	-	-	-	
	(vi) construction of settling ponds, Channels	-	-	-	
	(vii) Afforestation of dump	-	182 nos	20000	
	(viii) Others (Please specify)	-	-	-	
	(ix) Others				
(C) REHABI- LATION OF BARREN AREA WITHIN LEASE	(i) Afforestation (green belt building)	-	182 nos	20000	safety zone
	(ii) Others (Please specify)	-	-	-	
(D) ENVIRO NMENTAL MONITORIN G (core zone)	(i) Ambient air quality	-	7	50000	
	(ii) Water Quality	-	2	40000	
	(iii) Noise Level Survey	-	5	50000	
	(iv) Ground Vibration	-	-	-	-
	(v) Others Soil	-	-	-	-
(D) ENVIRO NMENTAL MONITORIN G (buffer zone)	(i) Ambient air quality	-	2	40000	-
	(ii) Water Quality	-	2	40000	-
	(iii) Noise Level Survey	-	2	40000	-
	(iv) Ground Vibration	-	-	-	-
	(v) Others Soil	-	1	30000	-
TOTAL		0.6444		320000	



PROPOSAL FOR ITEM NO. 6 & 7 OF FMCP FOR THE YEAR 2017-18

ITEMS	DETAILS	AREA (HECT.) PROPO- SED	QUAN- TITY PROPO- SED	EXPENDITURE (Rs.) PROPO-SED	REMARKS
(A) RECLAMATI ON & REHABILIT ON OF MINES OUT IT AND AREA	(i) Stockpiling	-	-	-	-
	(ii) Afforestation on the backfilled area	Nil	Nil	Nil	-
	(iii) Others (please specify) e.g. Afforestation on exhausted benches	Nil	Nil	Nil	-
	(iv) pisciculture	Nil	Nil	Nil	-
	(v) Covering into water reservoir	Nil	Nil	Nil	-
	(vi) Picnic Spot	Nil	Nil	Nil	-
	(vii) Others	Nil	Nil	Nil	-
(B) STABILIZATI ON & REHABILITATI ON OF DUMPS (with Sease)	(i) Terracing	Nil	Nil	Nil	-
	(ii) Piling	0.49	39222 m ³	100000	0.49
	(iii) Construction of Parapet walls/Retaining wall at top of dumps	-	-	-	-
	(iv) Construction of Check Dams along slope of valleys etc.	-	-	-	-
	(v) Construction of Settling Ponds (Gardens drains etc.)	-	-	-	-
	(vi) construction of settling ponds, Channels	-	-	-	-
	(vii) Afforestation of dumps	0.04	80 nos	20000	0.04
	(viii) Others (Please specify)	-	-	-	-
(C) REHABI- LATION OF BARREN AREA WITHIN LEASE	(i) Afforestation (green belt building)	0.172	272 nos	30000	0.172
	(ii) Others (Please specify)	-	-	-	-
(D) ENVIRO NMENTAL MONITORIN G (core zone)	(i) Ambient air quality	-	7	50000	-
	(ii) Water Quality	-	2	40000	-
	(iii) Noise Level Survey	-	5	50000	-
	(iv) Ground Vibration	-	-	-	-
	(v) Other Soil	-	-	-	-
(D) ENVIRO NMENTAL MONITORIN G (buffer zone)	(i) Ambient air quality	-	3	40000	-
	(ii) Water Quality	-	3	40000	-
	(iii) Noise Level Survey	-	3	40000	-
	(iv) Ground Vibration	-	-	-	-
	(v) Other Soil	-	1	20000	-
TOTAL		0.93		430000	0.93



11.8 FINANCIAL ASSURANCE

The calculation is as below:

(As per CCOM's Circular No.4/2006)

S.N	Type of land use	Area of land use (in ha)			The area considered as fully reclaimed and rehabilitated (in Ha)	Net area considered for calculation of financial assurance (in Ha)
		As at present (Ha)	Additional requirement during the present scheme period (Ha)	Total (in Ha)		
		A	B	C=(A+B)	D	E=Σ(C-D)
1	Area of excavation	1.47	0.32	1.79	0.0	1.79
2	Storage for top-soil	0.0	0.0	0.0	0.0	0.0
3	Overburden dump	0.135	0.391	0.526	0.0	0.526
4	Mineral storage	0.163	0.382	0.545	0.0	0.545
5	Infrastructure (Rest shelter & pumping station)	0.011	0.037	0.048	0.0	0.048
6	Road	0.786	0.110	0.896	0.0	0.896
7	Railway	0.0	0.00	0.00	0.0	0.00
8	Greenbelt	0.0	1.046	1.046	0.0	1.046
9	Tailing pond	0.	0.0	0.0	0.0	0.0
10	Effluent treatment plant	0.0	0.0	0.0	0.0	0.0
11	Mineral separation plant	0.0	0.0	0.0	0.0	0.0
12	Township area	0.0	0.0	0.0	0.0	0.0
13	Others (Garland drain along village road side)	0.0	1.2	1.2	0.0	1.2
	Total	2.565	3.486	6.051	0.0	6.051



*Financial assurance at the rate of Rs 25,000/- per hectare has been taken into account for calculation of total financial assurance.

As the mine is a **Category-A (OTFM)** mine, the total financial assurance comes to be $6.051 \times \text{Rs } 25,000/- = \text{Rs } 1,51,275/-$ (Rupees One Lakh fifty one thousand two hundred seventy five) only. Therefore, the minimum financial assurance of Rs 2,00,000/- (Rupees two lakh only) shall be submitted as and when required.

11.9 CERTIFICATE AND UNDERTAKING.

Undertaking to take up the proposals of the PMCP has been attached with the Mining Scheme.

11.10 PLANS, SECTIONS ETC.

The plans and sections of this mining scheme may be referred for different purposes.

अनुमोदित
APPROVED

[Handwritten Signature] 29/11/19

REGIONAL CONTROLLER OF MINES
राष्ट्रीय कोयला बोर्ड
INDIAN BUREAU OF MINES
भुवनेश्वर/भुवनेश्वर



QUARRY



QUARRY

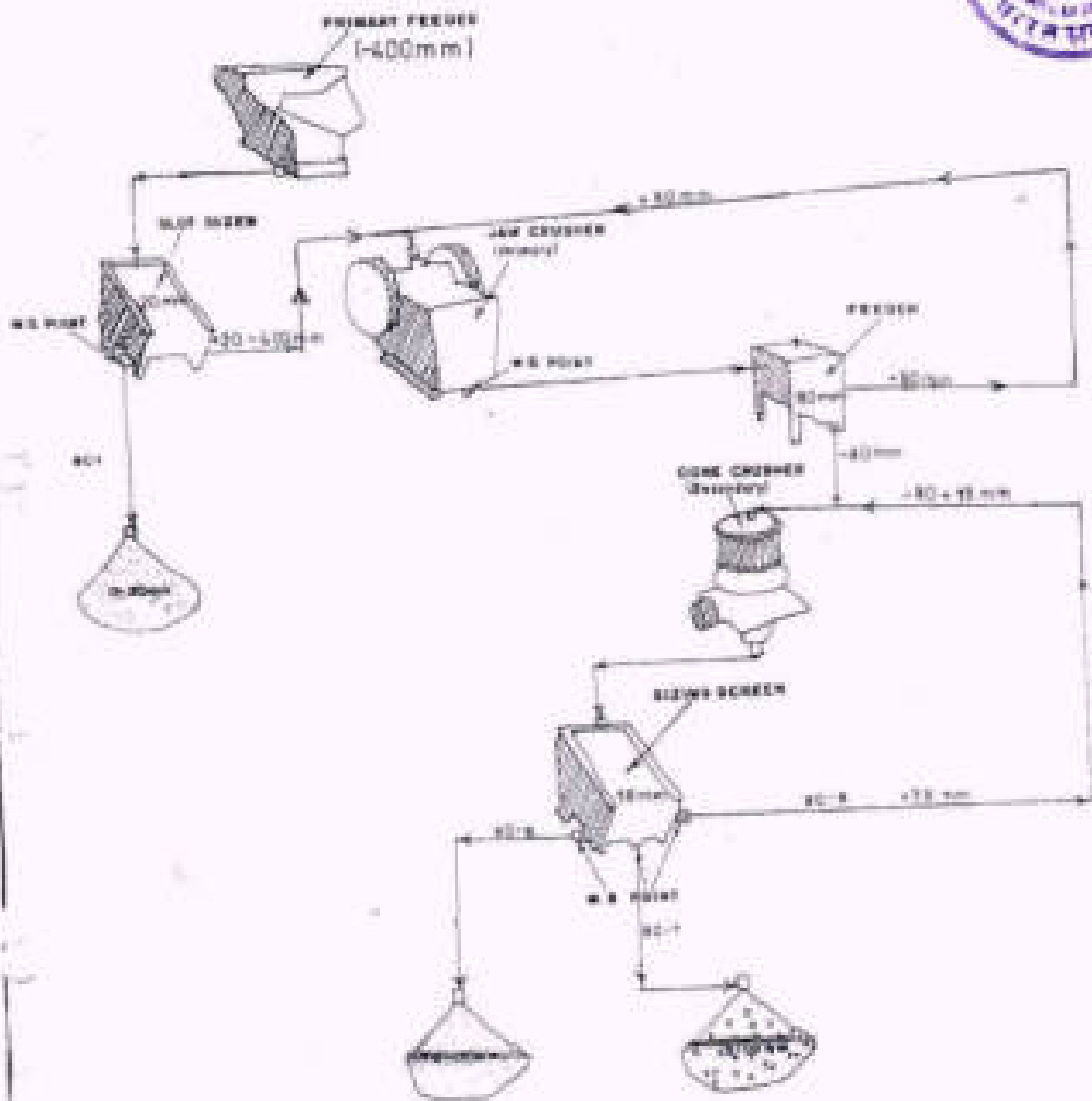

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BOUNDARY PILLAR



BOUNDARY PILLAR



Water sprayer at discharge point of BC-1, BC-2, BC-5, BC-6 and BC-7.
Dust hood for conveyors & screen for dust extraction.

BC-1 to 5. Shields for water sprayer.


CHANDRABHANU DAS
RQP/BBIS/052/2014/A

Phone Nos. (0674) 2744430/ 2742463

Fax No. (0674) 2744430

संघ संस्था GOVERNMENT OF INDIA

खान मंत्रालय MINISTRY OF MINES

भारतीय खान ब्यूरो INDIAN BUREAU OF MINES

क्षेत्रीय खान नियंत्रक का कार्यालय OFFICE OF THE REGIONAL CONTROLLER OF MINES

महानी कॉम्प्लेक्स, दूधरी मंडिर

Mahani Complex, 2nd Floor

308, डिस्ट्रिक्ट सेंटर

308, District Centre

चंद्रसेखरपुर

Chandrasekharpur

भुवनेश्वर-751016

Bhubaneswar - 751016

No. MSM/OTF/MECH/61-ORJ/BH/2010-11

दिनांक / Date: 07.02.2011

To

Shri Syed Abdul Halim

Mine Owner

As/To: Barail

Dist: Keonjhar

Orissa

Sub: Approval of modification to Approved Scheme of Mining for Oraghat Iron & Manganese mine along with Progressive Mine Closure Plan (PMCP), over an area of 25.847 ha, in Sundergarh district of Orissa state, submitted by Shri Syed Abdul Halim under Rule 10 of MCDR, 1988 for the period 2010-11 to 2012-13.

Ref: (1) Your RQP's letter No. Nil dated 10.12.2010.
(2) This office letter of even number dated 15.02.2011.
(3) Your RQP letter No. Nil dated 25.02.2011

Sr.

In exercise of the power conferred by Sub-rule (4) of Rule 12 of the Mineral Conservation and Development Rules, 1988, I hereby APPROVE the above modification to the Approved Scheme of Mining for Oraghat Iron & Manganese mine along with Progressive Mine Closure Plan (PMCP), over an area of 25.847 ha, in Sundergarh district of Orissa state, submitted by Shri Syed Abdul Halim under Rule 10 of MCDR, 1988. This approval is subject to the following conditions in addition to the conditions imposed while approving the scheme of Mining vide letter No. MS/ OTF/MECH/ 26-ORJ/ BH/ 2008-09 dated 29.12.2008:

- (i) This modification to approved Scheme of Mining is approved without prejudice to any other law applicable to the mine area from time to time whether made by the Central Government, State Government or any other authority.
- (ii) It is also clarified that the approval of your aforesaid modification to approved Scheme of Mining does not in any way imply the approval of the Government in terms of any other provision of Mines & Minerals (Development & Regulation) Act, 1957, or the Mineral Conservation Rules, 1960 and any other laws including Forest (Conservation) Act, 1980, Environment (Protection) Act, 1986, or the rules made there under.
- (iii) It is further clarified that this approval of the modification to approved Scheme of Mining under Rule 12 of MCDR/1988 is subject to the provisions of Forest (Conservation) Act, 1980, Forest (Conservation) Rules, 2003 and other relevant statutes, orders and guidelines as maybe applicable to the lease area from time to time.
- (iv) It is further clarified that this approval of the modification to approved Scheme of Mining is subject to the Provisions of the Mines Act, 1952 and Rule & Regulations made there under including submission of notice of opening, appointment of manager and other statutory officials as required under the Mines Act, 1952.

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- (v) The execution of Scheme of Mining shall be subjected to vacation of prohibitory orders/ notices, if any.
- (vi) This approval for mining operations and associated activities is restricted to the mining lease area only. The mining lease area is as shown on the statutory plans under Rule 28 of Mineral Conservation and Development Rules 1988, by the Lessee/ RQP/ Applicant, and Indian Bureau of Mines has not undertaken verification of the mining lease boundary on the ground.
- (vii) If anything is found to be concealed as required by the Mines Act in the contents of the scheme of mining and the proposal for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect.
- (viii) At any stage, if it is observed that the information furnished in the document are incorrect or misrepresents facts, the approval of the documents shall be revoked with immediate effect.
- (ix) Your attention is invited to the Supreme Court interim order in W.P.(C) No.202, dated 12.12.06 for compliance. The approval of the Scheme of Mining is, therefore, issued without prejudice to and is subject to the said directions of the Supreme Court as applicable in your case.
- (x) The department does not undertake any responsibility regarding correctness of the boundaries of the lease shown on the ground with reference to lease map & other plans furnished by the applicant / lessee.
- (xi) This approval is given for the received proposals as applicable from this date.
- (xii) The modification to approved Scheme of Mining is approved without prejudice to any order or direction from any court of competent jurisdiction.
- (xiii) An yearly report before 1st July of every year setting forth the extent of protective and rehabilitative works carried out as envisaged in the approved mine closure plan, and if there is any deviation, reasons thereof should be submitted to Regional Controller of Mines, Indian Bureau of Mines, Bhubaneswar under Rule 23 E(2) of MCDR, 1988.
- (xiv) The Financial Assurance for an amount of Rs. 2,35,855/- (Rupees Two Lakh Thirty Five Thousand Eight hundred Fifty Five only) is valid up to 31.03.2013. A new bank guarantee is to be submitted on or before its expiry i.e. 31.03.2013 or before the expiry of scheme period whichever is earlier.
- (xv) A copy of Environmental clearance letter issued by MOEF should be submitted to IBM, Bhubaneswar immediately after approval of EIA - EMP for record and information.
- (xvi) The Environmental Monitoring Cell shall continue monitoring ambient air quality, dust-fall rate, water quality, soil sample analysis and noise level measurements at various stations established for the purpose both in the core zone and buffer zone as per requirement of Environment Guidelines and keeping in view IBM's circular No. 3/ 92 & 2/ 93 season-wise every year or by engaging the services of an Environmental Laboratory approved by MOEF/ CPCB. The data so generated shall be maintained in a bound pagged register kept for the purpose and the same shall be made available to the inspecting officer, on demand.
- (xvii) The provisions of circular No. 2/ 2010 of the Chief Controller of Mines, Indian Bureau of Mines, Nagpur issued vide letter No. N- 11013/ 2/ MP/ 90-COM Vol. VII dated 06.04.2010 shall be complied within a period of 90 days of approval of this document.

Encl. One copy of approved scheme of mining

Yours faithfully

(Sd/-)

(Mr. Rg/ S.TTU)

Regional Controller of Mines

CHANDRASHANU DAS
RQP/BSS/052/2004/A

Copy for kind information to:

1. Shri Arindam Dash, RQP, M/s Geo Consultants Pvt Ltd, 290 A, Ground Floor, (in front of Ekamra Talkies), Cuttack Road, Bomikhal, Bhubaneswar - 751 010.
2. The Director of Mines Safety, Directorate General of Mines Safety, Chaibasa Region, At & Post Chaibasa, District - Singhbhum West along with one copy of the approved scheme of mining by **REGISTERED PARCEL**.
3. The Director of Mines, Directorate of Mines, Government of Orissa, Heads of the Department Building, New Capital, Bhubaneswar- 751 001 Orissa along with one copy of the approved scheme of mining by **REGISTERED PARCEL**.

(Sd/- S.TTU)

ଶ୍ରୀ ଅରିନ୍ଦମ ଦାଶ / Regional controller of Mines

CHANDRASHANU DAS
RQP/BS/052/2004/A

FORM - K

(Particulars to be recorded in a durable bound pagged book in respect of each

Bore-hole/pit/shaft)

(See rule 4B)

MINE CODE _____

1. Name of the Mineral or Minerals for which the licence or lease is granted : Iron & Manganese
2. Name and address of the licensee or lessee : Shri Syed Abdul Halim, Bashi Road,
At/Po- Barbil, Dht-Keonjhar-758034
3. Name of prospect/mine : Oraghat Iron & Mn. Mines.
4. Location :
 - (i) Topo sheet Number : 73 G/5
 - (ii) Cadastral Survey or Khata number : 73 G/5
 - (iii) Village : Oraghat
 - (iv) Taluka : Rairi
 - (v) District : Sundergarh
 - (vi) State : Odisha
5. Type and make of the drill and size of core : DTH drill, 100mm dia.
6. Bore hole/pit number its location :
 - (a) Reduced level at the collar of the bore hole/pit : Please refer Annexure - I
 - (b) Inclination and bearing of the hole : Perpendicular
 - (c) Altitude of the formation :
7. Duration of drilling/pitting :
 - (a) Date of commencement : 21.06.2010
 - (b) Date of completion : 25.06.2010
8. Total length of the hole/pit/shaft : 20 m (avg.) per bore hole
9. Purpose of drilling/pitting : To explore the Mineral Zone Area.
10. Total operating expenditure incurred : Rs. 3,25,000.00
11. Details of intersection : Please refer Annexure-II

Place : Oraghat

Date : 26.11.10

Signature :

Name in full : Chandra Sekhar Jena

Designation : Mines Manager

DESCRIPTION OF BORE HOLES

BH. No.	Location	Reduced Level	Depth of Iron Zone	Sample No. & Date
01	48m E ,187m N	583.6 m	1.5m - 7.5 m 8.5m - 20.0 m	S - 1 (dt.21.06.10) S - 2
02	48m E ,216m N	582.7 m	1 m - 8.7 m 9.6 m - 20.0 m	S - 3 (dt.21.06.10) S - 4
03	52m E ,238m N	581.0 m	0 - 9.0m 10.0m - 20.0m	S - 5 (dt.21.06.10) S - 6
04	260m W ,262m N	592.6 m	2.6m - 11.0m 12.4m - 20.0 m	S - 7 (dt.21.06.10) S - 8
05	254m W ,290m N	592.3 m	1.8m - 10.0m 11.0m - 20.0m	S - 9 (dt.21.06.10) S - 10
06	247m W ,327m N	590.0 m	0 - 11.0m 11.8m - 20.0m	S - 1 (dt.22.06.10) S - 2
07	247m W ,352m N	590.0 m	0 - 11.0m 12.0m - 20.0m	S - 3 (dt.22.06.10) S - 4
08	254m W ,395m N	596.0 m	1.6m - 2.2 m 2.8m - 4.5 m	S - 5 (dt.22.06.10) S - 6
09	254m W ,413m N	596.0 m	1.6m - 2.2 m 2.8m - 4.5 m	S - 7 (dt.22.06.10) S - 8
10	241m W ,402m N	594.0 m	0.0m - 3.5 m 3.0m - 4.5 m	S - 9 (dt.22.06.10) S - 10
11	258m W ,428m N	596.3 m	1.3m - 2.0 m 2.5m - 3.5m	S - 1 (dt.23.06.10) S - 2
12	350m W ,288m N	605.8 m	1.0m - 2.5m 18.5m - 20.0m	S - 3 (dt.23.06.10) S - 4
13	355m W ,344m N	608.0 m	1.0m - 2.5m 19.5m - 20.0m	S - 5 (dt.23.06.10) S - 6
14	346m W ,393m N	607.5 m	1.0m - 2.6m 19.0m - 20.0m	S - 7 (dt.23.06.10) S - 8
15	345m W ,424m N	607.0 m	0.6m - 2.6m 19.0m - 20.0m	S - 9 (dt.23.06.10) S - 10

Bore hole no:- 01

Location:- 48E.187N

Bore hole collar:-583.6

Date of commencement:- 21.06.2010

Date of completion:- 21.06.2010

Machine used:- Ingersoll rand

From	To	Thickness (m.)	Lithology	Fe %
0.0	1.0	1.0	Latentlic soil	44.5
1.0	1.5	0.5	Latentlic soil	
1.5	2.0	0.5	iron ore	
2.0	3.0	1.0	iron ore	56.3
3.0	4.0	1.0	iron ore	
4.0	5.0	1.0	iron ore	
5.0	6.0	1.0	iron ore	
6.0	7.0	1.0	iron ore	
7.0	7.5	0.5	iron ore	
7.5	8.0	0.5	Feruginous shale	
8.0	8.5	0.5	Feruginous shale	44.5
8.5	9.0	0.5	iron ore	
9.0	10.0	1.0	iron ore	
10.0	11.0	1.0	iron ore	58.8
11.0	12.0	1.0	iron ore	
12.0	13.0	1.0	iron ore	
13.0	14.0	1.0	iron ore	
14.0	15.0	1.0	iron ore	
15.0	16.0	1.0	iron ore	
16.0	17.0	1.0	iron ore	
17.0	18.0	1.0	iron ore	
18.0	19.0	1.0	iron ore	
19.0	20.0	1.0	iron ore	

BH:- 1 Closed at the depth of 20 m due to less capacity of drilling rig.


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Bore hole no.:- 02

Location:- 48 E, 214 N

Bore hole collar:-582.7m

Date of commencement:- 21.06.2010

Date of completion:- 21.06.2010

Machine used:- Ingersoll rand

From	To	Thickness (m.)	Lithology	Fe %
0.0	1.0	1.0	Latentia soil	<45
1.0	2.0	1.0	iron ore	57.25
2.0	3.0	1.0	iron ore	
3.0	4.0	1.0	iron ore	
4.0	5.0	1.0	iron ore	
5.0	6.0	1.0	iron ore	
6.0	7.0	1.0	iron ore	
7.0	8.0	1.0	iron ore	
8.0	8.7	0.7	iron ore	
8.7	9.0	0.3	Feruginous shale	<45
9.0	9.6	0.6	Feruginous shale	
9.6	10.0	0.4	iron ore	60.25
10.0	11.0	1.0	iron ore	
11.0	12.0	1.0	iron ore	
12.0	13.0	1.0	iron ore	
13.0	14.0	1.0	iron ore	
14.0	15.0	1.0	iron ore	
15.0	16.0	1.0	iron ore	
16.0	17.0	1.0	iron ore	
17.0	18.0	1.0	iron ore	
18.0	19.0	1.0	iron ore	
19.0	20.0	1.0	iron ore	

BH- 2 Closed at the depth of 20 mt due to less capacity of drilling rig.

Bore hole no.: - 03

Location: - 52 E, 238 N

Bore hole collar: - 582.0m

Date of commencement: - 21.04.2010

Date of completion: - 21.04.2010

Machine used :- Ingersoll rand

From	To	Thickness (m.)	Lithology	Fe %
0.0	1.0	1.0	iron ore	61.2
1.0	2.0	1.0	iron ore	
2.0	3.0	1.0	iron ore	
3.0	4.0	1.0	iron ore	
4.0	5.0	1.0	iron ore	
5.0	6.0	1.0	iron ore	
6.0	7.0	1.0	iron ore	
7.0	8.0	1.0	iron ore	
8.0	9.0	1.0	iron ore	
9.0	10.0	1.0	feruginous shale	44.5
10.0	11.0	1.0	iron ore	61.73
11.0	12.0	1.0	iron ore	
12.0	13.0	1.0	iron ore	
13.0	14.0	1.0	iron ore	
14.0	15.0	1.0	iron ore	
15.0	16.0	1.0	iron ore	
16.0	17.0	1.0	iron ore	
17.0	18.0	1.0	iron ore	
18.0	19.0	1.0	iron ore	
19.0	20.0	1.0	iron ore	

BB-3 Closed at the depth of 20 mt due to less capacity of drilling rig.

Bore hole no.:- 04

Location:- 260w, 262 N

Bore hole collar:-592.4m

Date of commencement :- 21.04.2010

Date of completion :- 21.04.2010

Machine used :- Ingersoll rand

From	To	Thickness (m.)	Lithology	Fe %
0.0	1.0	1.0	Lateritic soil	<45
1.0	2.0	1.0	Lateritic soil	
2.0	2.4	0.4	Lateritic soil	
2.4	3.0	0.4	iron ore	
3.0	4.0	1.0	iron ore	
4.0	5.0	1.0	iron ore	60.35
5.0	6.0	1.0	iron ore	
6.0	7.0	1.0	iron ore	
7.0	8.0	1.0	iron ore	
8.0	9.0	1.0	iron ore	
9.0	10.0	1.0	iron ore	<45
10.0	11.0	1.0	iron ore	
11.0	12.0	1.0	Feruginous shale	
12.0	12.4	0.4	Feruginous shale	
12.4	13.0	0.4	iron ore	
13.0	14.0	1.0	iron ore	59.66
14.0	15.0	1.0	iron ore	
15.0	16.0	1.0	iron ore	
16.0	17.0	1.0	iron ore	
17.0	18.0	1.0	iron ore	
18.0	19.0	1.0	iron ore	
19.0	20.0	1.0	iron ore	

BH- 4 Closed at the depth of 20 mt due to less capacity of drilling rig.

Bore hole no.:- 05

Location:- 254w, 290 N

Bore hole collar:-592.3m

Date of commencement:- 21.06.2010

Date of completion :- 21.06.2010

Machine used :- Ingersoll rand

From	To	Thickness (m.)	Uthology	Fe %
0.0	0.8	0.8	Lateritic soil	<45
0.8	1.8	1.0	Lateritic soil	
1.8	2.0	0.2	iron ore	58.94
2.0	3.0	1.0	iron ore	
3.0	4.0	1.0	iron ore	
4.0	5.0	1.0	iron ore	
5.0	6.0	1.0	iron ore	
6.0	7.0	1.0	iron ore	
7.0	8.0	1.0	iron ore	
8.0	9.0	1.0	iron ore	
9.0	10.0	1.0	iron ore	
10.0	11.0	1.0	Ferruginous shale	<45
11.0	12.0	1.0	iron ore	40-51
12.0	12.4	0.4	iron ore	
12.4	13.0	0.6	iron ore	
13.0	14.0	1.0	iron ore	
14.0	15.0	1.0	iron ore	
15.0	16.0	1.0	iron ore	
16.0	17.0	1.0	iron ore	
17.0	18.0	1.0	iron ore	
18.0	19.0	1.0	iron ore	
19.0	20.0	1.0	iron ore	

BH:- Stopped at the depth of 20 m due to less capacity of drilling rig.


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RQP/BBS/052/2004/A

Bore hole no.:- 06

Location:- 247w, 327 N

Bore hole collar:-590.0m

Date of commencement :- 22.06.2010

Date of completion :- 22.06.2010

Machine used :- Ingersoll rand

From	To	Thickness (m.)	Lithology	Fe %
0.0	1.0	1.0	iron ore	61.33
1.0	2.0	1.0	iron ore	
2.0	3.0	1.0	iron ore	
3.0	4.0	1.0	iron ore	
4.0	5.0	1.0	iron ore	
5.0	6.0	1.0	iron ore	
6.0	7.0	1.0	iron ore	
7.0	8.0	1.0	iron ore	
8.0	9.0	1.0	iron ore	
9.0	10.0	1.0	iron ore	
10.0	11.0	1.0	iron ore	445
11.0	11.8	0.8	Feruginous shale	
11.8	12.0	0.2	iron ore	62.15
12.0	13.0	1.0	iron ore	
13.0	14.0	1.0	iron ore	
14.0	15.0	1.0	iron ore	
15.0	16.0	1.0	iron ore	
16.0	17.0	1.0	iron ore	
17.0	18.0	1.0	iron ore	
18.0	19.0	1.0	iron ore	
19.0	20.0	1.0	iron ore	

HO4- 6 Closed at the depth of 20 m due to less capacity of drilling rig.


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RQP/BSN/52/004/A

Bore hole no.: 07

Location: 247w, 352 N

Bore hole collar: 590.0m

Date of commencement: 22.06.2010

Date of completion: 22.06.2010

Machine used: Ingersoll rand

From	To	Thickness (m.)	Lithology	Fe %
0.0	1.0	1.0	iron ore	58.52
1.0	2.0	1.0	iron ore	
2.0	3.0	1.0	iron ore	
3.0	4.0	1.0	iron ore	
4.0	5.0	1.0	iron ore	
5.0	6.0	1.0	iron ore	
6.0	7.0	1.0	iron ore	
7.0	8.0	1.0	iron ore	
8.0	9.0	1.0	iron ore	
9.0	10.0	1.0	iron ore	
10.0	11.0	1.0	iron ore	<4%
11.0	12.0	1.0	Feruginous shale	
12.0	13.0	1.0	iron ore	
13.0	14.0	1.0	iron ore	
14.0	15.0	1.0	iron ore	
15.0	16.0	1.0	iron ore	
16.0	17.0	1.0	iron ore	
17.0	18.0	1.0	iron ore	
18.0	19.0	1.0	iron ore	
19.0	20.0	1.0	iron ore	

HH- 7 Closed at the depth of 20 m due to less capacity of drilling rig.

Bore hole no:- 08

Location:- 254w, 395 N

Bore hole collar:-596.0m

Date of commencement:- 22.06.2010

Date of completion:- 22.06.2010

Machine used :- Ingersoll rand

From	To	Thickness (m.)	Lithology	Fe %
0.0	0.6	0.6	iron ore	57.6
0.6	1.6	1.0	iron ore	
1.6	2.0	0.4	iron ore	
2.0	2.2	0.2	iron ore	
2.2	2.8	0.6	iron ore	
2.8	3.0	0.2	iron ore	
3.0	4.0	1.0	iron ore	
4.0	4.5	0.5	iron ore	
4.5	5.0	0.5	iron ore	
5.0	6.0	1.0	iron ore	
6.0	7.0	1.0	iron ore	
7.0	8.0	1.0	Ferruginous shale	44.3
8.0	9.0	1.0	iron ore	
9.0	10.0	1.0	iron ore	
10.0	10.6	0.6	iron ore	
				59.0

BH- 8 Closed at the depth of 10.6 m due to less capacity of drilling rig.

Bore hole no:- 09

Location:- 254w, 413 N

Bore hole collar:- 596.0m

Date of commencement :- 22.06.2010

Date of completion :- 22.06.2010

Machine used :- Ingersoll rand

From	To	Thickness (m.)	Lithology	Fe %
0.0	0.6	0.6	lateritic soil	<45
0.6	1.6	1.0	lateritic soil	
1.6	2.0	0.4	iron ore	
2.0	2.2	0.2	iron ore	80.52
2.2	2.8	0.6	Poruginous shale	<45
2.8	3.0	0.2	iron ore	
3.0	4.0	1.0	iron ore	60.58
4.0	4.5	0.5	iron ore	
4.5	5.0	0.5	BHQ	
5.0	6.0	1.0	BHQ	
6.0	7.0	1.0	BHQ	
7.0	8.0	1.0	BHQ	
8.0	9.0	1.0	BHQ	<45
9.0	10.0	1.0	BHQ	
10.0	10.2	0.2	BHQ	

BH-9 Closed at the depth of 10.2 m due to less capacity of drilling rig.


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RQP/BBS/052/2004/4

Bore hole no:- 10

Location:- 241w, 402 N

Bore hole collar:-594.0m

Date of commencement:- 22.06.2010

Date of completion :- 22.06.2010

Machine used :- Ingersoll rand

From	To	Thickness (m.)	Lithology	Fe %
0.0	1.0	1.0	iron ore	56.18
1.0	2.0	1.0	iron ore	
2.0	2.5	0.5	iron ore	
2.5	3.0	0.5	Famuginous shale	<45
3.0	4.0	1.0	iron ore	57.55
4.0	4.5	0.5	iron ore	
4.5	5.0	0.5	BHG	<45
5.0	6.0	1.0	BHG	
6.0	7.0	1.0	BHG	
7.0	8.0	1.0	BHG	
8.0	9.0	1.0	BHG	
9.0	10.0	1.0	BHG	
10.0	11.0	1.0	BHG	

BH- 10 Closed at the depth of 11 mt due to less capacity of drilling rig.

Bore hole no.:- 11

Location:- 258w, 428 N

Bore hole collar:-596.3m

Date of commencement:- 23.06.2010

Date of completion :- 23.06.2010

Machine used :- Ingersoll rand

From	To	Thickness (m.)	Lithology	Fe %
0.0	0.5	0.5	lateritic soil	<45
0.5	1.3	0.8	lateritic soil	
1.3	2.0	0.7	iron ore	57.51
2.0	2.5	0.5	Feruginous shale	<45
2.5	3.0	0.5	iron ore	
3.0	3.5	0.5	iron ore	57.18
3.5	4.0	0.5	iron ore	
4.0	5.0	1.0	BHQ	
5.0	6.0	1.0	BHQ	<45
6.0	7.0	1.0	BHQ	
7.0	8.0	1.0	BHQ	
8.0	9.0	1.0	BHQ	
9.0	10.0	1.0	BHQ	
10.0	11.0	1.0	BHQ	
11.0	11.8	0.8	BHQ	

BBH- 11 Closed at the depth of 11.8 m due to low capacity of drilling rig.

Bore hole no.:- 12

Location:- 350w, 288 N

Bore hole collar:-405.8m

Date of commencement:- 23.04.2010

Date of completion:- 23.04.2010

Machine used:- Ingersoll rand

From	To	Thickness (m)	Lithology	Fe %
0.0	1.0	1.0	lateritic soil	44.5 60.74
1.0	2.0	1.0	iron ore	
2.0	2.5	0.5	iron ore	
2.5	3.0	0.5	lateritic soil	
3.0	4.0	1.0	lateritic soil	44.5
4.0	5.0	1.0	lateritic soil	
5.0	6.0	1.0	lateritic soil	
6.0	7.0	1.0	lateritic soil	
7.0	8.0	1.0	lateritic soil	
8.0	9.0	1.0	lateritic soil	
9.0	10.0	1.0	lateritic soil	
10.0	11.0	1.0	lateritic soil	
11.0	12.0	1.0	lateritic soil	
12.0	13.0	1.0	lateritic soil	
13.0	14.0	1.0	lateritic soil	
14.0	15.0	1.0	lateritic soil	
15.0	16.0	1.0	lateritic soil	
16.0	17.0	1.0	lateritic soil	
17.0	18.0	1.0	lateritic soil	
18.0	18.5	0.5	lateritic soil	42.0
18.5	19.0	0.5	iron ore	
19.0	20.0	1.0	iron ore	

BH-12 Closed at the depth of 20 m due to less capacity of drilling rig.

Bore hole no.:- 13

Location:- 355w, 344 N

Bore hole collar:- 808.0m

Date of commencement:- 23.06.2010

Date of completion:- 23.06.2010

Machine used:- Ingersoll rand

From	To	Thickness (m)	Lithology	Fe %
0.0	1.0	1.0	lateritic soil	<45
1.0	2.0	1.0	iron ore	58.9
2.0	2.5	0.5	iron ore	
2.5	3.0	0.5	lateritic soil	
3.0	4.0	1.0	lateritic soil	
4.0	5.0	1.0	lateritic soil	
5.0	6.0	1.0	lateritic soil	
6.0	7.0	1.0	lateritic soil	
7.0	8.0	1.0	lateritic soil	
8.0	9.0	1.0	lateritic soil	
9.0	10.0	1.0	lateritic soil	
10.0	11.0	1.0	lateritic soil	<45
11.0	12.0	1.0	lateritic soil	
12.0	13.0	1.0	lateritic soil	
13.0	14.0	1.0	lateritic soil	
14.0	15.0	1.0	lateritic soil	
15.0	16.0	1.0	lateritic soil	
16.0	17.0	1.0	lateritic soil	
17.0	18.0	1.0	lateritic soil	
18.0	19.0	1.0	lateritic soil	
19.0	19.5	0.5	lateritic soil	
19.5	20.0	0.5	iron ore	60.33

BH- 13 Closed at the depth of 20 m due to low capacity of drilling rig.

Bore hole no:- 14

Location:- 346W, 393 N

Bore hole collar:-607.5m

Date of commencement :- 23.06.2010

Date of completion :- 23.06.2010

Machine used :- Ingersoll rand

From	To	Thickness [m.]	Lithology	Fe %
0.0	1.0	1.0	lateritic soil	44.5
1.0	2.0	1.0	iron ore	56.42
2.0	2.4	0.4	iron ore	
2.4	3.0	0.4	lateritic soil	
3.0	4.0	1.0	lateritic soil	
4.0	5.0	1.0	lateritic soil	
5.0	6.0	1.0	lateritic soil	
6.0	7.0	1.0	lateritic soil	
7.0	8.0	1.0	lateritic soil	
8.0	9.0	1.0	lateritic soil	
9.0	10.0	1.0	lateritic soil	44.5
10.0	11.0	1.0	lateritic soil	
11.0	12.0	1.0	lateritic soil	
12.0	13.0	1.0	lateritic soil	
13.0	14.0	1.0	lateritic soil	
14.0	15.0	1.0	lateritic soil	
15.0	16.0	1.0	lateritic soil	
16.0	17.0	1.0	lateritic soil	
17.0	18.0	1.0	lateritic soil	
18.0	19.0	1.0	lateritic soil	
19.0	20.0	1.0	iron ore	57.18

BH- 14 Closed at the depth of 20 m due to less capacity of drilling rig.

Bore hole no.:- 15

Location:- 345w. 424 N

Bore hole collar:- 607.0m

Date of commencement :- 23.06.2010

Date of completion :- 23.06.2010

Machine used :- Ingersoll rand

From	To	Thickness (m.)	Lithology	Fe %
0.0	0.4	0.4	lateritic soil	<45
0.4	1.0	0.4	iron ore	
1.0	2.0	1.0	iron ore	
2.0	2.4	0.4	iron ore	
2.4	3.0	0.4	lateritic soil	67.11
3.0	4.0	1.0	lateritic soil	
4.0	5.0	1.0	lateritic soil	
5.0	6.0	1.0	lateritic soil	
6.0	7.0	1.0	lateritic soil	
7.0	8.0	1.0	lateritic soil	
8.0	9.0	1.0	lateritic soil	
9.0	10.0	1.0	lateritic soil	
10.0	11.0	1.0	lateritic soil	
11.0	12.0	1.0	lateritic soil	
12.0	13.0	1.0	lateritic soil	
13.0	14.0	1.0	lateritic soil	
14.0	15.0	1.0	lateritic soil	
15.0	16.0	1.0	lateritic soil	
16.0	17.0	1.0	lateritic soil	
17.0	18.0	1.0	lateritic soil	
18.0	19.0	1.0	lateritic soil	
19.0	20.0	1.0	iron ore	61.99

III- 15 Closed at the depth of 20 mt due to less capacity of drilling rig.



KALYANI LABORATORIES

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AN ISO 9001 & ISO 17025 CERTIFIED LABORATORY
CERTIFICATE NO. 100000001 & 100000002

LABORATORY TEST REPORT

Ref./Order No.: Nil
Date: 04.07.2010

Test Report No.: KL-TR/01/07/10
Date: 07.07.10
Page No.: 1/1

Name of Client: M/s Oraghat Iron & Manganese Mines

Acknowledgement No.: KL/07/S1

S. A. Halim, Sundargarh.

Date of receipt of sample: 04.07.10

Sample Description: DTH Iron Ore Samples

Sampling plan, if used: NA

Sample Drawn by: KAL / Client

(Seal/Rubber Stamp/Steel Stamp/Sticker)

Date of testing: 05.07.10

Test Method: 1493 (Part - 1) - 1981 Rfmd. 2006

Test Results:
As follows

Parameters	Results(%)									
	BH - 1		BH - 2		BH - 3		BH - 4		BH - 5	
	S - 1	S - 2	S - 3	S - 4	S - 5	S - 6	S - 7	S - 8	S - 9	S - 10
Fe	56.3	58.8	57.25	60.23	61.2	61.73	60.35	59.86	59.94	60.51
SiO ₂	2.90	2.25	3.13	1.78	1.44	1.77	2.03	1.55	2.15	1.80
Al ₂ O ₃	4.50	3.84	4.66	3.05	2.89	3.52	4.88	3.62	5.37	2.55

% UNCERTAINTY:

Remarks/Opinions/Interpretations:

Sample tested on dried at (105.0)°C basis.

- Note:
- The results stated above only to the items tested.
 - The report shall not be reproduced in full or in part without prior written consent from the KAL laboratory.
 - All tests are performed as per IS/ISM specifications/reference books.

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ISO 9001:2001 & ISO 17025:2005 LABORATORY
CERTIFICATION NO. 10001J02 & 10001J03

LABORATORY TEST REPORT

Ref. /Order No.: Nil

Date: 04.07.10

Test Report No.:KL-TR/01/07/10

Date: 07.07.10

Page No.: 1/1

Name of Client: M/s Oraghat Iron & Manganese Mines

Acknowledgement No.:KL/07/92

S. A. Halim, Sundargarh.

Date of receipt of sample: 04.07.10

Sample Description: DTH Iron Ore Samples

Sampling plan, if used: NA

Sample Drawn by: KAL / Client's

(Seal/Rubber Stamp/Steel Stamp/Sticker)

Date of testing: 05.07.10

Test Method: 1493 (Part - 1) - 1981 Rfind. 2006

Test Results:

As follows

Parameters	Results(%)									
	BH - 6		BH - 7		BH - 8		BH - 9		BH - 10	
	S - 1	S - 2	S - 3	S - 4	S - 5	S - 6	S - 7	S - 8	S - 9	S - 10
Fe	61.33	62.15	58.52	59.22	57.6	59.0	60.52	60.88	56.18	57.55
SiO ₂	1.70	1.44	2.42	2.27	2.61	2.33	1.85	2.0	2.70	2.11
Al ₂ O ₃	4.25	3.85	5.36	4.92	4.67	3.74	3.52	3.18	5.80	4.57

% UNCERTAINTY:

Remarks/Opinions/Interpretations:

Sample tested on dried at (105.0)^oC basis.

- Note:
- The results stated above only to the items tested.
 - The report shall not be reproduced in full or in part without prior written consent from the KAL laboratory.
 - All tests are performed as per IS/ISM specifications/reference books.

Signature

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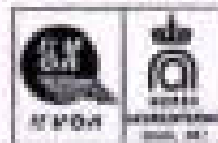
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ISO 9001:2001 & 17025:2005 CERTIFIED LABORATORY
CERTIFICATE NO. 100000004 & 100000005

LABORATORY TEST REPORT

Ref./Order No.: Nil
Date: 05.07.10

Test Report No.: KL-TR/01/07/10
Date: 08.07.10
Page No.: 1/1

Name of Client: M/s Oraghat Iron & Manganese Mines

Acknowledgement No.: KL/07/S3

S. A. Halim, Sundargarh.

Date of receipt of sample: 05.07.10

Sample Description: DTH Iron Ore Samples

Sampling plan, if used: NA

Sample Drawn by: KAL / Client

(Seal/Rubber Stamp/Steel Stamp/Sticker)

Date of testing: 06.07.10

Test Method: 1492 (Part - 1) - 1981 Rfind. 2006

Test Results:
As follows

Parameters	Results(%)									
	BH - 11		BH - 12		BH - 13		BH - 14		BH - 15	
	S - 1	S - 2	S - 3	S - 4	S - 5	S - 6	S - 7	S - 8	S - 9	S - 10
Fe	57.51	57.18	60.74	62.0	58.9	60.33	56.42	57.18	61.11	61.89
SiO ₂	2.77	2.68	1.92	1.22	3.15	2.37	2.66	2.85	1.28	2.0
Al ₂ O ₃	4.36	5.10	3.37	2.95	5.60	4.11	5.47	4.18	3.36	3.72

% UNCERTAINTY:

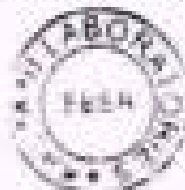
Remarks/Opinions/Interpretations:

Sample tested as dried at (105.0)°C basis.

- Note:
- The results stated above only to the items tested.
 - The report shall not be reproduced in full or in part without prior written consent from the KAL laboratory.
 - All tests are performed as per IS/ISM specifications/reference books.

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TEST REPORT

PAGE 1 OF 1

TEST REPORT NO: QUESANTP001017910000 DATE: 08/07/2019

NAME & ADDRESS OF CUSTOMER: METSARCO AGENSA, P/L (M-2011) ROOM NO 2-02, 3RD FLOOR, MEDIAL COMMERCIAL COMPLEX,
GUTHACK ROAD, BONGA-2

CUSTOMER'S REFERENCE: LETTER, (TRIMODARANT, 20 JULY 2019) DATE: 08/07/2019

SAMPLE PARTICULATE: POWDER

SAMPLE RECEIPT DATE: 08/07/2019

NO. OF SAMPLE(S): 04 x 200 gm

SAMPLE DESCRIPTION: SAMPLE RECEIVED FROM METSARCO AGENSA P/L

LOCATION OF SAMPLE: POWDER, SAMPLE

TESTS REQUESTED: Fe, SiO₂, Al₂O₃ (wt %)

TEST METHOD: Fe (AOAC 923.03) Al₂O₃ (AOAC 923.15) SiO₂ (AOAC 923.04)

TEST RESULTS

ANALYSIS COMMENCEMENT DATE		08/07/2019		ANALYSIS COMPLETION DATE		08/17/2019						
SAMPLE NO. (to Customer)	SAMPLE CODE (Laboratory)	TEST PARAMETERS										
		Fe %	SiO ₂ %	Al ₂ O ₃ %								
SAMPLE #01	Q1400	68.06	2.07	8.30								
SAMPLE #02	Q1400	68.06	2.08	8.31								
SAMPLE #03	Q1400	68.27	2.20	8.37								
SAMPLE #04	Q1400	62.83	1.68	8.29								

REMARKS

Samples are tested on dry basis. Submitted by the party

This report is prepared by the laboratory for which the laboratory has no liability

Reference:

PREPARED BY

S. SULTAN

(QCT ASST)

CHECKED BY

S. SULTAN

(QCT TECHNICAL MANAGER)

S. SULTAN

(QCT TECHNICAL MANAGER)

AUTHORIZED SIGNATORY

This report is prepared by the laboratory which is subject to the sample tested only

The contents of this report shall not be reproduced or used in full or in part without prior written consent of the laboratory



CHANDRABHANU DAS
RQP/BS/052/2004/A



STATE ENVIRONMENT IMPACT ASSESSMENT AUTHORITY (SEIAA), ORISSA.

(Constituted vide Order No. S.O. 2674 (E) Dated 17th Nov. 2008 of Ministry of Environment & Forest, Govt. of India
Under Environment Protection Act, 1986.)

Gr. No.- SRF-2/1, Unit-IX, Bhubaneswar-751022

E-mail: seiaaorissa@gmail.com

Ref No SEIAA/ 217 /ENV

Date 16.04.11

SEIAA - 167/10

From

Bhagirathi Behera, IFS
Director, Environment-cum-
Spl. Secretary to Government
& Member Secretary, SEIAA, Orissa

To

Shri Syed Abdul Halim
Mines Owner
A/Po-Barbi, Dist-Kaonjhar, Orissa

Sub: Environmental Clearance of Oraghat iron & manganese mine of Shri Syed Abdul Halim, Village Oraghat, Boral in the district of Sundergarh.

Sir,

This has reference to your letter no nil dated 18.02.2008 along with the application in the prescribed format submitted to MOEF, Govt. of India and subsequent letters no. nil dated 28.07.2010, 13.08.2010, 14.08.2010, 02.12.2010, 28.01.2011 and 04.02.2011 on the above mentioned subject. I am directed to say that the State Environment Impact Assessment Authority, Orissa has considered the application for the proposal for production of iron ore of capacity 72,884 TPA and Manganese ore 7563 TPA. The mine lease area is 25.847 ha. The mine has also applied for one mobile crushing unit of 50 TPH capacity. The mining lease comprise DLC Forest land -5.880 Ha. Mine working will be opencast semi-mechanized involving drilling and blasting. The ultimate size of iron ore pit is 156366 m² and Manganese ore is 3652 m². The mining scheme for the proposed production capacity for the year 2008-09 to 2012-13 is approved by IBM vide letter dated 29.12.08. The life of the mine will be 5 years for iron ore and 5 years for manganese ore. The MOEF, Govt. of India have issued ToR vide letter no. J-11015/83/2008-IA.II(M) dated 23.09.2008. The public hearing was conducted on 28.04.2010.

The proposal was placed in the SEAC meeting held on 6th and 7th Dec. 2010. Considering the information furnished and presentation made by the consultant M/s Kalyani Laboratories Pvt. Ltd, Bhubaneswar, the committee decided to consider the proposal after receipt of certain information/document /clarification from the proponent. The proponent furnished the information/document /clarification and the committee verified the same.

Based on the information/ documents and clarifications provided by you and on recommendation of the SEAC, Orissa the State EIA Authority, Orissa hereby accords

CHANDRABHANU DAS
RQF1885/032/2004/A

✓
Environmental Clearance in favour of the project for a period of 5 (five) years under the provisions of the Environment Impact Assessment Notification, 2006 and 2009 and subsequent amendment thereto under various MOEF, Govt. of India circulars thereunder and subject to the following stipulated conditions.

Stipulated Conditions:-

- i. The applicant (Project Proponent) will take necessary measures for prevention, control and mitigation of Air Pollution, Water Pollution, Noise Pollution and Land Pollution including solid waste management as mentioned by him in Form-1, Final EIA reports and Environment Management Plan (EMP) in compliance with the prescribed statutory norms and standards.
- ii. The applicant will take necessary steps for socio-economic development of the people of the area on need based assessment for providing employment, education, health care, drinking water and sanitation, road and communication facilities etc after a detailed primary socio-economic survey.
- iii. The applicant will comply to the points, concerns and issues raised by the people during public hearing on 28.04.2010 in accordance with the commitments made by him thereon.
- iv. The applicant will take statutory clearance /approval/ permissions from the concerned authorities in respect of his project as and when required.
- v. For post environmental clearance monitoring, the applicant will submit half-yearly compliance report in respect of the stipulated terms and conditions of Environmental Clearance to the State Environmental Impact Assessment Authority (SEIAA) Orissa on 1st June and 1st December of each calendar year.
- vi. The core zone should be monitored intensively with no. of stations as prescribed by CPCB, Delhi and unit of pollutant level should be expressed as NAAQ of CPCB, Delhi. The detailed methodology adopted for analysis of samples shall be clearly indicated.
- vii. The proponent shall submit baseline data on flora & fauna and CSR activities already carried out within three months to the SEIAA.
- viii. Adequate buffer zone shall be maintained between two consecutive mineral bearing deposits.
- ix. Zero waste mining concept shall be implemented either by putting up pelletisation plant or dispose of low grade ores/fines to prospective buyers.
- x. The following shall be implemented viz. (a) dump run-off should be diverted into settling ponds. (b) adequate rain water harvesting and ground water recharging facilities should be developed in the core zone; (c) attempt should be made to achieve zero water balance.
- xi. Maintenance of roads through which transportation of ores are undertaken shall be carried out by the project proponent regularly at its own cost.
- xii. Fugitive dust generation shall be controlled. Fugitive dust emission shall be regularly monitored at locations of nearest human habitation (including schools and other public amenities located nearest to sources of dust

- generation as applicable) and records shall be submitted to the SEIAA, Orissa.
- xiii Mineral handling area shall be provided with adequate number of high efficiency dust extraction system. Loading and unloading areas including all the transfer points should also have efficient dust control arrangements. These should be properly maintained and operated.
 - xiv Transportation of ore shall be done by covering the trucks with tarpaulin or other suitable mechanism so that no spillage of ore / dust takes place.
 - xv Rain water harvesting shall be undertaken to recharge the ground water source.
 - xvi Monitoring of ground and surface water quality shall be regularly conducted and records should be maintained and data shall be submitted regularly to the SEIAA, Orissa.
 - xvii The proponent shall ensure that no silt originating due to mining activity is transported in the surface water course. Measures for prevention and control of soil erosion and management of silt shall be undertaken. Protection of dumps against erosion shall be carried out with geo textile matting or other suitable material, and thick plantations of native trees and shrubs shall be carried out at the dump slopes. Dumps shall be protected by retaining walls.
 - xviii Trenches / garland drains shall be constructed at foot of dumps to arrest silt from being carried to water bodies. Adequate number of Check Dams shall be constructed across seasonal / perennial nallahs (if any) flowing through the ML area and silts be arrested. De-silting at regular intervals shall be carried out.
 - xix Provision shall be made for the housing of the labourers within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilet, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.
 - xx Occupational health and safety measures for the workers including identification of work related health hazards, training on malaria eradication, HIV and health effects on exposure to mineral dust etc. shall be carried out. The proponent shall engage a full time qualified doctor who is trained in occupational health. Periodic monitoring for exposure to respirable mineral dust on the workers shall be conducted and records maintained including health records of the workers. Awareness programme for workers on impact of mining on their health and precautionary measures like use of personal equipments etc. shall be carried out periodically. Review of impact of various health measures undertaken (at interval of five years or less) shall be conducted followed by follow up action wherever required. Occupational Health Centre shall be established near the mine site itself.
 - xxi Shelter belt i.e. Wind Break of 15 m width and consisting of at least 5 tiers around lease facing the human habitation, school / agricultural fields etc. (if any in the vicinity), in the safety zone/ back filled & reclaimed areas, around voids & roads shall be raised. Green belt development and selection of plant species shall be as per CPCB guidelines. Density of the trees has to be

- around 2500 plants per hectare. Herbs and shrubs shall also form a part of afforestation programme besides tree plantation. Help & guidance of local DFO may be sought in the matter. Details of year wise afforestation programming including rehabilitation of mined out area shall be submitted to the SEIAA, Orissa within six months.
- xxii. This Environmental Clearance is subject to Forest Clearance under the Forest (Conservation) Act, 1980.
 - xxiii. The mining operations shall be restricted to above ground water table and it should not intersect the groundwater table.
 - xxiv. The top soil shall temporarily be stored at earmarked site(s) only and it should not be kept unutilized for long (not more than 3 years). The topsoil shall be used for land reclamation and plantation.
 - xxv. The over burden (OB) generated during the mining operation shall be stacked at earmarked dump site (s) only and it should not be kept active for a long period of time and its phase wise stabilization shall be carried out. Proper terracing of OB dump shall be carried out so that the overall slope shall not exceed 28°. Backfilling shall be done as per approved mining plan. Back-filling to start from 3rd year onwards of the mining operation & the entire quantity of waste generated shall be back-filled & liquidated within five years. There shall be no external over burden dumps after the 5th year of the mining operation. The backfilled area shall be afforested. Back-filling has to be done in a manner that it is restored to the normal ground level. Monitoring & management of rehabilitated areas should continue till the vegetation is established & becomes self-generating. Compliance status to be reported to the appropriate authorities.
 - xxvi. The funds earmarked for the environment protection measures shall be judiciously utilized. Under no circumstances this funds shall be diverted for other purposes. Year wise expenditure for this fund should be reported to the SEIAA, Orissa.
 - xxvii. The critical parameters in the ambient air within the impact zone, peak particle velocity at 300m distance or within the nearest habitation, whichever is closer shall be monitored periodically. Further, quality of discharged water shall also be monitored [TDS, DO, pH and Total Suspended Solids (TSS)]. The monitored data shall be uploaded on the website of the company as well as displayed on a displayed board at the project site at a suitable location near the main gate of the Company in public domain. The circular No. J-20012/1/2006-IA.II(M) dated 27.06.2009 issued by Ministry of Environment and Forests, which is available on the website of the Ministry www.mef.gov.in shall also be referred in this regard for its compliance.
 - xxviii. A final mine closure plan along with details of Corpus Fund shall be submitted to the SEIAA 5 years in advance of final mine closure for approval.
 - xxix. The project proponent shall obtain necessary prior permission of the competent authorities for drawl of requisite quantity of water (surface water and ground water) required for the project.

- xxx. The project proponent shall prepare wild life conservation plan in consultation with DFO and adequate safety and mitigation measures should be incorporated to protect the wild life, flora, fauna to mitigate adverse impact.
- xxx. The above mentioned stipulated conditions shall be complied in time bound manner. Failure to comply with any of the conditions mentioned above may result in withdrawal of this environmental clearance and attract action under the provisions of Environment Protection (EP) Act, 1986.

2. This Environmental Clearance is subject to the grant / approval/ sanction of mining lease by the competent Authority as required under law. The Environment Clearance will stand automatically cancelled if mining lease is not sanctioned or is cancelled.


Member Secretary

Memo No. _____

Dt. _____

Copy to:

1. Ministry of Environment & Forests Govt. of India, Paryavaran Bhawan, C.G.O. Complex, Lochi Road, New Delhi-110003 for kind information.
2. Principal Secretary to Govt., Forests & Environment Dept. Orissa for kind information.
3. Chairman, State Pollution Control Board, Paribesh Bhawan, A/116, Nilakantha Nagar, Unit-8, BBSR for kind information.
4. Chief Conservator of Forests, Regional Office (EZ), Ministry of Environment & Forests, A-31, Government of India, Chandra Sekharpur, Bhubaneswar for kind information.
5. Chairman, Central Pollution Control Board, CBD-cum-office Complex, East Arjun Nagar, New Delhi, 110032 for kind information.
6. The District Collector & Magistrate, Sundargarh for kind information and necessary action.
7. Copy forwarded to the Chairman/ Member Secy. / Member, SEIAA for kind information.
8. Chairman, SEAC/Secretary, SEAC, Paribesh Bhawan, A/116, Nilakantha Nagar, Unit-VIII, Bhubaneswar for kind information.
9. Guard file for records.

Sd/-
Member Secretary



CONSENT ORDER

Page 1

BY REGD. POST WITH AD

STATE POLLUTION CONTROL BOARD, ODISHA

A/118, Nilakantha Nagar, Unit-VIII, Bhubaneswar-751012
Phone-2561909, Fax: 2562822, 2562903

CONSENT ORDER

No. 742 / IND-I-CON- 5671 Dt. 24.06.13

CONSENT ORDER NO. 1710

Sub Consent for discharge of sewage and trade effluent under section 25/26 of Water (PCP) Act, 1974 and for existing / new operation of the plant under section 21 of Air (PCP) Act, 1981.

Ref Your application No. (i) Nil Dated 17.01.2013
(ii) Nil Dated 21.03.2013

Consent to operate is hereby granted under section 25/26 of Water (Prevention & Control of Pollution) Act, 1974 and under section 21 of Air (Prevention & Control of Pollution) Act, 1981 and rules framed thereunder :-

Name of the Industry: ORAGHAT IRON & MANGANESE MINES OF M/S. S.A. HALIM

Name of the Occupier & Designation: SRI. KAMALAKANTA SAMAL, AGENT

Address: AT: ORAGHAT, PO: SANINDUPUR, DIST: SUNDARGARH

This consent order is valid for the period up to 31/03/2014

Details of Products Manufactured

Ss. No	Product	Quantity
01	Iron Ore	12,000 TPA
02	Manganese Ore	6,000 TPA

This consent order is valid for the specified outlets, discharge quantity and quality (spec chimney/stack, emission quantity and quality of emissions as specified below. This consent is granted subject to the general and special conditions stipulated therein.

CHANDRASHANU DAS
RGP/BB/S/052/2004/A

A. Discharge permitted through the following outlet subject to the standard

Out let outlet	Description of Point of discharge	Quantity of discharge	pH	Pre-scribed Standard			
				TSS (mg/l)	BOD (mg/l)	Oil & Fat (mg/l)	Fe (mg/l)
01 Domestic effluent	Soak pit	-	5.5-9.0	200	100	10	-
02 Mine drainage /Inland surface water /surface runoff/ other wastewater	On Land	-	5.5-9.0	100 (100 days)	-	10 (30 days)	3.0-2.0

B. Emission permitted through the following stack subject to the prescribed standard

Chimney	Stack No.	Description of Stack	Quantity of emission	Prescribed Standard	SO ₂ NO _x	

C.

Disposal of solid waste permitted in the following manner

Sl. No.	Type of Solid waste	Quantity Generated (TPO)	Quantity to be reused on site (TPO)	Quantity to be reused off site (TPO)	Quantity disposed off (TPO)	Description of disposal site.
01 Top soil/over burden	As per mining plan	-	-	-	-	As per approved mining plan



D. GENERAL CONDITIONS FOR ALL UNITS

The consent is given by the Board in consideration of the particulars given in the application. Any change or information or deviation made in actual practice from the particulars furnished in the application will void the ground rules for conservation/enrichment of the consent order under section 21 of the Act or Water (Pollution & Control) Act, 1974 and Section 21 of Air (Prevention & Control of Pollution) Act, 1987 and the consent order will become void in terms of the provisions of the Acts.

The applicant shall immediately submit request application for consent to operate to the Board in the event of any change in the quantity and quality of the effluent and/or in manufacturing process or quality/quantity of the effluent rate of emission (air pollution control equipment) system etc.

The applicant shall not change or alter either the quality or quantity or the rate of discharge or temperature in the mode of discharge without the previous written permission from the Board.

The applicant shall comply with and carry out the directions/orders issued by the Board in the consent order and at all subsequent times within the stipulated time frame. In case of non-compliance of any direction/order issued at any time without violation of the terms and conditions of the consent order, the applicant shall be liable for legal action as per the provisions of the Law/Act.

The applicant shall make an application for grant of fresh consent at least 60 days before the date of expiry of the consent order.

The receipt of the consent does not convey any property right in either real or personal property or any intellectual privileges nor does it confer any right to provide property in the violation of statutory rights, nor any infringement of Criminal, State laws or regulation.

The consent shall not be a license or authorize the construction of any physical structure or facilities or the undertaking of any work in any nature or manner.

The applicant shall display the consent granted to him in a prominent place for perusal of the public and visiting officers of the Board.

The applicant shall allow a licensed and duly qualified Board's Officers during the visit to the factory.

The applicant shall furnish to the visiting officer of the Board any information regarding the construction, installation or operation of the plant or of air and water pollution control system, waste monitoring system, any other particulars as may be pertinent to preventing and controlling air and water pollution.

Works shall be affixed in the entrance of the water supply connection so that such meters are easily accessible for inspection and maintenance and for other purposes of the Act. It is provided that the place where it is affixed shall in no case be at a point before which water has been supplied by the authority for alterations for any purpose whatsoever.

Domestic consumption water shall be used for the ascending the quantity of water used for each of the purposes mentioned below:

- (a) Industrial cooling, including in steam jets or lower level.
- (b) Domestic purposes.
- (c) Process.

The applicant shall provide suitable facility based at the place where the effluent is entering into any water body or any other place to be regulated by the Board, indicating therein that the area near which the effluents are being discharged is reserved for the domestic discharging.

Some water shall not be mixed to mix with the trade and/or domestic effluent on the upstream of the terminal manhole where the flow shall only forward will be stopped.

The applicant shall maintain good house-keeping both within the factory and the premises. All pipes, valves, tanks and drains shall be kept free from sediment that do not collect into the effluent collection system only and shall not be allowed to find their way in down drains or open areas.

The applicant shall at all times maintain in good working order and operate as efficiently as possible all treatment or control facilities or systems which are used by him to adhere to the terms and conditions of the consent.

Good records shall be kept in respect of wastewater lagoons, if any, includingly aerated and not utilized as waste storage ponds. The wastewater lagoons shall be fitted with the required covers for effective digestion. Lagoons should be constructed with sides and bottom made impervious.

The collection of treated effluent on factory's own land, if any, should be completed and there should be no possibility of the effluent getting absorbed in any drainage channel or other water source either directly or by seepage.

The effluent treatment pond, if any, should be free without causing any nuisance to the surroundings or occupation of the lands at any time.

If at any time the disposal of treated effluent on land becomes inadequate or unsatisfactory or creates any problem or becomes a matter of dispute, the applicant shall adopt other satisfactory treatment and disposal measures.

The effluent treatment pond shall be fitted in design drying beds and the dried sludge shall be taken to designated land.

The effluent treatment pond and disposal measures shall become operative at the time of commencement of production.

The applicant shall provide port house for sampling the emissions and process. Provisions for carrying out stack sampling and process emission point tests and other arrangements for chimneys/smoke and other sources of emissions shall be in place. Samples of emission by the Board in the event of any complaint shall be taken in accordance with the provisions of the Act or Rules made thereon.

The applicant shall provide all facilities and make required assistance to the Board staff for collection of samples / waste monitoring / inspection.

The applicant shall not change or alter either the quality or quantity or rate of emission or mode, replace or alter the air pollution control equipment or change the raw material or manufacturing process resulting in any change in quality and/or quantity of emissions, without the previous written permission of the Board.



1. The applicant shall install mechanical composite sampling equipment and continuous flow measuring / recording device in the effluent stream at least as follows: - effluent. A record of daily discharge shall be maintained.
2. The following information shall be forwarded to the Member Secretary on or before 10th of every month:
 - a. Performance / progress of the treatment plant
 - b. Monthly statement of daily discharge of domestic and/or trade effluent.
3. Non-compliance with effluent limitations
 - a. If for any reason the applicant does not comply with or is unable to comply with any effluent limitations specified in this consent, the applicant shall immediately notify the consent issuing authority by telephone and provide the consent issuing authority with the following information: -
 - i. Within 2 days of such notification
 - ii. Details of non-compliance
 - iii. A description of the non-compliance discharge including its impact on the receiving waters
 - iv. An estimate time of continuance of non-compliance if expected to continue or if such condition has been corrected the duration of non-compliance
 - v. Steps taken by the applicant to reduce and minimize the non-compliance discharge and
 - vi. Steps to be taken by the applicant to prevent the condition of non-compliance
 - b. The applicant shall take all reasonable steps to minimize any adverse impact to natural waters resulting from non-compliance with any effluent limitations specified in this consent including such accelerated or additional monitoring as necessary to determine the nature and extent of the non-compliance discharge.
 - c. Nothing in this consent shall be construed to relieve the applicant from civil or criminal penalties for non-compliance whether or not such non-compliance is due to factors beyond his control, such as power down, electric failure, accident or natural disaster.
4. The applicant shall at his own cost get the effluent samples collected both before and after treatment and get them analysed at an approved laboratory every month for the parameters specified in Part II and shall submit in duplicate the report thereof to the Board.
5. The addition of various treatment chemicals should be done only with mechanical dosers and proper equipment for regulation of correct dosage. Intermediate tank used for a stock solution flowing. Careful practices such as dumping of chemicals in drains or tanks or throwing of acids or alkalis, entering and exiting pipes for stirring etc. should not be resorted to.
6. In the disposal of treated effluent intended for irrigation, the industry shall keep in view of the need for:
 - a. Rotation of crops
 - b. Change in point of application of effluent on land
 - c. Pattern of land application
7. The adoption of these measures and not becoming sick or stale, the industry may ensure this in consultation with the Agriculture Department.
8. It is the sole responsibility of the industry to ensure that there are no complaints at any time from the people in the surrounding areas as a result of discharge or leakage of trade effluent if any.
9. Proper housekeeping shall be maintained by a dedicated team.
10. The industry must constitute a team of chemists and technically qualified personnel who will ensure continuous operation of all pollution control devices (except the stack providing night house) and should be in a position to explain the status of operation of the pollution control measures to the inspecting officers of the Board at any point of time. The name of these persons with their contact telephone numbers shall be intimated to the concerned Regional Officer and Head Office of the Board and in case of any change in the team it shall be intimated to the Board immediately.

E. SPECIAL CONDITIONS:

- 1) Grant of consent to operate is subject to grant of permission from Director of Mines, and Forest Department, Government of Odisha for working in the Non-forest Government land within granted surface right area.
- 2) A copy of the annual return submitted to IBM, Govt. of India/ Directorate of Mines, Govt. of Odisha) shall be submitted every year.
- 3) The environmental statement report shall be submitted to the Board in proper format every year.
- 4) Drifts shall either be operated with dust extractors or equipped with water injection system.
- 5) Controlled blasting shall be practiced. No blasting shall be carried out after the sunset.
- 6) The top soil shall be stored at earmarked site (s) only and stabilized or shall be used for land reclamation and plantation.
- 7) The over burden generated during the course of mining shall be stacked at earmarked dump site (s) and stabilized or used for reclamation of excavated land.
- 8) The project proponent shall ensure that no natural water course and / or water resources are obstructed due to any mining operations.
- 9) Catch dams shall be constructed at appropriate places of the mine lease area to prevent run off of water and flow of sediment directly into nearby water bodies.
- 10) Retention wall shall be constructed at the toe of topsoil dump and OB dump. Garland drain shall be constructed around topsoil dumps, over burden dumps and mineral dumps terminating at settling pit to prevent run off of water and flow of sediments directly into nearby water bodies. Garland drain and sedimentation pit shall be desludged at regular intervals. The discharge quality shall meet the standards prescribed by the Board.
- 11) Regular water sprinkling shall be carried out in critical areas prone to air pollution such as around crushing and screening plant. Water sprinkling shall be carried out on haul roads at desired interval. Haulage roads shall be devoid of ruts and potholes and shall be maintained properly to avoid generation of dust during movement of vehicles.
- 12) Mineral handling plant (crusher & screening plant) if any shall be provided with adequate number of high efficiency dust extraction system or dust suppression system preferably dry fog system. Loading the unloading areas including all the transfer points shall also have efficient dust suppression arrangements. These shall be properly maintained and operated.
- 13) The mine shall take necessary action for compliance of the following air and water quality standards. Emission and wastewater quality monitoring shall be done by the lessee twice in a week and report shall be submitted once in six months to the Board.

Parameter	Standard
A. Emission standards for stack for De-dusting unit	
Particulate matter	100mg/Nm ³
Stack height **	15.0m
** Stack height for De-dusting unit shall be calculated as $H=74 Q^{0.725}$, where H and Q are stack height in metre and particulate matter (PM) emission in tone / hr respectively. i.e.	
Q (ton/hr)	H (metre)
Up to 2.71	15
2.72-7.86	20
7.87-17.96	25
17.97-35.29	30
Note: Stack attached to De-dusting unit shall have minimum height of 15.0 meters and would be atleast 2.50 metres above the top-most point of the nearby building / shed or plant in the mine	
B. Fugitive Emission Standards	
Particulate Matter	1200 µgm ³
Note: Fugitive emission shall be monitored in the predominant downwind direction at a distance 25.0 ± 2.0 metres from the source of fugitive emission as per following	
Area	Monitoring Location
Mine face / Benches	Drilling, excavation and loading applicable for operating benches above water table
Haul Roads/ Service Roads	Haul roads to ore processing plant, waste dumps and loading areas and service road
Crushing plant	Run-off mine unloading at hopper, crushing areas, screens and transfer points
Screening plant	Screens, conveying and transportation of ore discharge points
Ore storage and loading	Intermediate stock bin / pile areas, ore stock bin / pile areas, wagon / truck loading areas
Waste dump	Active waste / reject dumps
C. Effluent Standards	
pH	5.5-9.0
Suspended solids (non-rainy day)	50 mg/l
Suspended solids (rainy day)	100 mg/l
Oil & Grease	10 mg/l
Note: (i) All efforts shall be made to reuse and re-circulate the treated effluent. (ii) The above said effluent standards shall be complied with for sewage, service water, beneficiation of ore wash water and surface run-off put together.	

- (4) Adequate Ambient Air Quality Monitoring Stations shall be established and location the stations shall be decided based on the meteorological data, topographical features, environmental and ecologically sensitive targets in consultation with the Regional Officer, State Pollution Control Board.
- (5) Monitoring of Ambient Air Quality of the mine shall be done twice in a week (24 hour at a particular site and data shall be submitted to the State Pollution Control Board once in six months.
- (6) It shall be ensured that the Ambient Air Quality Parameters conform to the norm prescribed for Industrial Area (prescribed in the consent order).
- (7) Regular monitoring of water quality of upstream and downstream of the nearby water bodies if any shall be carried out and record of monitored data shall be maintained and submitted to the State Pollution Control Board once in every year.
- (8) Appropriate mitigative measures shall be taken to prevent pollution of the nearby water bodies.
- (9) Sewage treatment plant shall be installed for the colony if any. Other domestic wastewater shall be discharged to soak pit through septic tank constructed as per BIS specification.
- (20) Service centers (i.e. auto shops, HVM shops, and other areas, wherein, water pollution due to wash outs of oil and grease and suspended solids are expected, effluent treatment plant shall be provided. The treated effluent shall be reused or shall be discharged to outside after meeting the prescribed standards. Canteen effluent shall also be treated before disposal.
- (21) Quantification of surface runoff generated during monsoon shall be done and data to be furnished by August-2013.
- (22) Measures shall be taken for control of noise levels below 85 dBA in the work environment.
- (23) Ambient air quality monitoring data, noise monitoring data and water / wastewater quality monitoring data shall be electronically displayed at the entry point of the mine or at a suitable location of the mine latest by 31st July, 2013.
- (24) Plantation shall be raised in the non-mineralized area, backfilled and reclaimed area and along the haul roads etc. by planting the native species in consultation with the local DFO.



- 2.4 The mine shall submit a declaration by 30th April every year that all pollution control systems are in good condition, operated and ambient air quality and wastewater quality conforming to the prescribed standards.

TO,

SRI KAMALAKANTA SAMAL, AGENT,
ORAGHAT IRON AND MANGANESE MINES
M/S. S. A. HALIM,
AT: BASTI ROAD, PO: BARBIL,
DIST. KEONJHAR, PIN-758035


MEMBER SECRETARY
STATE POLLUTION CONTROL BOARD, ODISHA

Memo No. _____/Dt.

Copy forwarded to

- (i) Regional Officer, State Pollution Control Board, Bhubaneswar
- (ii) District Collector, Sundargarh
- (iii) D.F.O. Bonai,
- (iv) Deputy Director of Mines, Kobra
- (v) Case Section (Head Office)
- (vi) Consent Register
- (vii) SES (I), SPC Board, Bhubaneswar

SR. ENV. SCIENTIST (MINES)
STATE POLLUTION CONTROL BOARD, ODISHA


CHANDRABHANU DAS
ROP/BS/052/2004/A

GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENT POLLUTANTS



GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENTAL POLLUTANTS PART -A : EFFLUENTS

Sl. No.	Parameters	Standards			
		Inland surface	Public sewers	Land for irrigation	Marine Coastal Areas
		(a)	(b)	(c)	(d)
1	Colour & odour	Colourless/Odourless as far as practicable	—	See 6 of Annex-1	See 6 of Annex-1
2	Suspended Solids (mg/l)	100	600	200	For process wastewater – 100 b. For cooling water effluent 10% above total suspended matter of influent.
3	Particulate size of TSS	Shall pass 850	—	—	
4	pH value	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0
5	Temperature	Shall not exceed 5°C above the receiving water temperature	—	—	Shall not exceed 5°C above the receiving water temperature
6	Oil & Grease mg/l max	10	20	10	20
7	Total residual chlorine	1.0	—	—	1.0
8	Ammonical nitrogen (as N) mg/l max	50	50	—	50
9	Total Kjeldahl nitrogen (as NH ₄) mg/l max	100	—	—	100
10	Free ammonia (as NH ₃) mg/l max	5.0	—	—	5.0
11	Biochemical Oxygen Demand (5 days at 20°C) mg/l max	30	350	100	100
12	Chemical Oxygen Demand mg/l max	250	—	—	250
13	Arsenic (as As) mg/l max	0.2	0.2	0.2	0.2
14	Mercury (as Hg) mg/l max	0.01	0.01	—	0.001
15	Lead (as Pb) mg/l max	01	1.0	—	2.0



CONSENT ORDER

Page 12

17	Cadmium (as Cd) mg/l	2.0	1.0	—	2.0
18	Hexavalent Chromium (as Cr + 6) mg/l max	0.1	2.0	—	1.0
19	Total Chromium (as Cr) mg/l max	2.0	2.0	—	2.0
20	Copper (as Cu) mg/l	3.0	3.0	—	3.0
21	Zinc (as Zn) mg/l max	5.0	15	—	15
22	Selenium (as Se) mg/l	0.05	0.05	—	0.05
23	Nickel (as Ni) mg/l max	3.0	3.0	—	3.0
24	Chloride (as Cl) mg/l	0.3	2.0	0.2	0.02
25	Fluoride (as F) mg/l	2.0	15	—	15
26	Dissolved Fluorides (as F) mg/l max	5.0	—	—	—
27	Sulfate (as S) mg/l	2.0	—	—	5.0
28	Phosphate compounds as PO_4O^{3-} mg/l max	1.0	5.0	—	5.0
29	Disinfectant residuals A. Active residual B. Free residual mg/l mg/l mg/l	10^1 10^1 10^1	10^1 10^1 10^1	10^1 10^1 10^1	10^1 10^1 10^1
30	Two-day BOD	90% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent
31	Ammonia (as NH) mg/l	2 mg/l	2 mg/l	—	2 mg/l
32	Iron (Fe) mg/l	3 mg/l	3 mg/l	—	3 mg/l
33	Vanadium (as V) mg/l	0.2 mg/l	0.2 mg/l	—	0.2 mg/l
34	Nitrate Nitrogen mg/l	10 mg/l	—	—	20 mg/l

NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutants	Time Weighted Average	Concentrate of Ambient Air		Methods of Measurement
		Industrial Residential, Rural and other Area	Ecologically Sensitive Area (notified by Central Government)	
(2)	(3)	(4)	(5)	(6)
Sulphur Dioxide (SO ₂) µg/m ³	Annual *	50	20	- Improved wet and Gaeke
	24 Hours **	80	80	- Ultraviolet fluorescence
Nitrogen Dioxide (NO ₂) µg/m ³	Annual *	40	30	- Modified Jacob & Hochheiser (Na-Arsenite)
	24 Hours **	80	80	- Chemiluminescence
Particulate Matter (size less than 10µm) or PM ₁₀ µg/m ³	Annual *	60	60	- Gravimetric
	24 Hours **	100	100	- TOEM
Particulate Matter (size less than 2.5µm) or PM _{2.5} µg/m ³	Annual *	40	40	- Beta Attenuation
	24 Hours **	60	60	- Gravimetric
Ozone (O ₃) µg/m ³	8 Hours **	100	100	- TOEM
	1 Hours **	180	180	- Beta Attenuation
Lead (Pb) µg/m ³	Annual *	0.50	0.50	- Gravimetric
	24 Hours **	1.0	1.0	- TOEM
Carbon Monoxide (CO) mg/m ³	8 Hours **	02	02	- Beta Attenuation
	1 Hours **	04	04	- Gravimetric
Ammonia (NH ₃) µg/m ³	Annual *	100	100	- TOEM
	24 Hours **	400	400	- Beta Attenuation
Benzene (C ₆ H ₆) µg/m ³	Annual *	05	05	- TOEM
	24 Hours **	05	05	- Beta Attenuation
Benzo (a) Pyrene (BaP)-Particulate phase only, ng/m ³	Annual *	01	01	- TOEM
	24 Hours **	01	01	- Beta Attenuation
Arsenic (As), ng/m ³	Annual *	06	06	- TOEM
	24 Hours **	06	06	- Beta Attenuation
Nickel (Ni), ng/m ³	Annual *	20	20	- TOEM
	24 Hours **	20	20	- Beta Attenuation

* Annual average: mean of maximum 24 measurements in a year at a particular site taken once a week
 ** 24 hourly or 08 hourly or 01 hourly measured values, as applicable, shall be complied with 98% of the time in a year, 2% of the time, they may exceed the limits but not on two consecutive days of monitoring



OFFICE OF THE DIVISIONAL FOREST OFFICER: BONAI DIVISION.

Ph/Fax - 06626-244434 E-mail: dfobonai@rediffmail.com

Memo No. 2469 / 6F-Dt. 14.11.12

To

The Regional Chief Conservator of Forests,
Rourkela Circle, Rourkela.

Sub

Proposal for diversion of 5.888 ha. of DLC forest land (including 0.562 ha. of Safety Zone area) in village Oraghat by Mrs Sayed Abdul Halim-State SI. No.176/06 dt.31.3.2006.

Ref :-

Memo No 9207/9F (MG)-161/06 dt.31.3.2006 of the CCF (Nodal), Bhubaneswar addressed to this office, and copy endorsed to you in the next Memo.

A proposal for diversion of 5.888 ha. of forest land (including 0.562 ha. of Safety Zone) (PRF / DLC Forest-5.888 ha.) in village Oraghat in Sundargarh District, Orisha for Iron & Manganese Ore Mining by M/s Sayed Abdul Halim is sent herewith in pentaplicate for onward transmission to Govt. of India, Ministry of Environment & Forest for approval under Section-2 of Forest (Conservation) Act 1980.

1. Brief Description.

The Mining lease of M/s S.A. Halim is subsisting lease over an area of 25.847 ha. in village Oraghat in Sundargarh District. The ML was valid for 20 years from 5.4.1998 to 5.4.2018, the lease deed of which has been executed on 6.04.1998 over an area of 25.847 ha. (Page-23-73/DP). According to this lease deed, the ML area of 25.847 ha. comprises of PRF/DLC forest-5.888 ha., and 19.959 ha. of Non-forest (Page-23-73/DP). The lease was executed for mining of Iron & Manganese Ore. The User Agency has applied for diversion of 5.888 ha. of PRF/DLC forest land, including 0.562 ha. PRF/ DLC forest land has been marked for Safety Zone.

The land schedule of the total lease area in the Mining lease area over 25.847 ha. has been furnished at (Page-74-76/DP).

The ML area has been delineated in Survey of India Toposheet No. 73Gr5 and finds Place within latitude 22° 55' 45" (North) and longitude 85° 18' 45" (East). This proposed lease area does not form part of any National park/ Wildlife Sanctuary/ Biosphere Reserve/ Tiger Reserve. There is no archaeological monument within the applied area. The total cost of this project is about Rs.1.63 Crores (Page-11-12/DP). This project will generate direct employment for 80 persons, which will increase gradually.

Contd 2.

CHANDRABHANU DAS
RQ/BS/052/2004/A

Received this
Proposed 5.888 ha.
16/11/12

The User Agency has furnished the following maps:

Sl. No.	Particulars	Scale	Plate No.
01	Location Map shown in Toposheet with	1 : 50,000	I
02	Adjoining Lease areas	16" 1 mile	II
03	Lease Plan	16" 1 mile	III
04	Broken up map	4000	IV
05	Culting land use plan	1 : 1000	V
06	Geological Plan	1 : 4000	VI
07	Proposed land use plan	1 : 4000	VII
08	Safety Zone plan	1 : 4000	VIII
09	Phase wise Reclamation plan	Not to scale	IX
10	Method of reclamation Plan	16" 1 mile	X
11	Lease plan showing on the village sheet	16" 1 mile	XI
	Compendary Afforestation Map		

Front Line 1

3. Forest Land
The total area of 25,847 ha in the ML is consisting private forest 5,888 ha, and 19,959 ha of non-forest land

The purpose was break-up of the total land required for the

project is funded through

Sl. No.	Pattern of utilization	Forest Land			Total
		Forest (ha)	Forest (ha)	Forest (ha)	
1	Mining	5.128	5.128	1.627	6.755
2	Storing of material / ore			1.127	1.127
3	Dumping of overburden			11.637	11.637
4	Run-grade stack			0.158	0.158
5	Auxiliary activities			5.326	5.326
6	Land use for public purpose (road, river, canal etc.)			1.779	1.779
7	Sub Total (b)	-	0.327	0.327	1.779
8	boundary			0.305	0.305
9	50m wide along the river			1.390	1.390
10	10m wide along both side of the village road		0.238	0.238	1.561
11	7.5 m wide along both side of the power line			0.262	0.262
	Sub Total (c)	-	0.562	0.562	4.351
	Grand Total (a+b+c)	-	5.888	5.888	25.847

The broken up land has been partly verified by the officials of Mining and Forest Department on 20.9.2010 in presence of User Agency (Plate-III). There is no pre-1980 broken up forest area. However, the post-1980 broken up forest area statement is furnished below.

Sl. No.	Pattern of utilization	VF Area (Ha.)	PRF/DLC Area (Ha.)	Total Area (Ha.)
1	Mining	Nil	0.643	0.643

4. Flora & Fauna

Tree Species which are commonly noticed in this area are Sal, Mahul, Kandu, Asan, Kusum, Mango, Jama, Kurum Mundi etc. Sal is the predominant species.

Wild animals such as Indian Hare, Barking deer, Lizard etc. are noticed in the area. No rare or endangered flora or fauna is noticed in this area.

5. Wildlife Management

Though the area does not form a part of National Park/Wildlife Sanctuary/Elephant Corridor, due care is to be taken for conservation of Wildlife. For this purpose, a comprehensive wildlife Management Plan covering the entire mining belt of Bonai & Keonjhar Division has been prepared. Accordingly the User Agency has to pay @ Rs.20,000/- per hectare of leasehold area as per revised norm approved by Govt. of Orissa communicated in Memo No.10F(Cons)-81/2004/6495/F&E dated 23.4.2008 of Forest & Environment Department. The lessee has furnished undertaking to bear the cost of Wildlife management (Page-252/DP).

6. Tree enumeration

Out of the total 5.888 ha. proposed for diversion, tree enumeration has been taken up only for the standing trees that in PRF/DLC forest land over 5.888 ha. (5.326 ha. Virgin area = 165 nos. trees + 0.562 ha. Safety Zone = 28 nos. trees). The abstract of tree enumeration has been furnished at Page-284/286/DP.

Hence, 165 Nos. of trees above 30 cm girth (In Virgin area 165 nos. of trees) to be felled during mining operation over the applied forest land. The density has been reported to be 0.2 with Eco value Class-I.

Contd 4



Compensatory Afforestation

Details of area		Area in ha.
Total ML area		25.847
(-) Pre-1980 Broken Forest & Non-Forest land		Nil
Virgin Forest & Non-Forest land		25.847
(-) Non-Forest land		19.959
Total forest land (PRF / DLC)		5.888
(-) PRF / DLC forest land in Safety Zone		0.562
PRF / DLC forest land for which CA is required		5.326

The total area of the Mining lease is 25.847 ha. According to

joint verification of broken up land carried out in the ML by the officials of Revenue, Steel and Mines and Forest Department 0.643 ha. of PRF/DLC forest land has been broken after 25.10.1980. An extent of 5.326 ha. of forest land including 0.562 ha. of Safety Zone area) has been proposed for diversion and Compensatory Afforestation scheme has been prepared over equivalent non-forest land identified in village Bonehela of Tamsa Range of this Division. Accordingly the following non-forest land

SL. No.	Khata No.	Plot No.	Tenant's Name	Kusam	Area in Acres	Remarks
1	55	28	AAA	Pahada	1.241	Part
2	60	29	-do-	-do-	11.428	Part
3	60	32	-do-	-do-	2.157	Part
TOTAL					14.826 Ac	
					8.80 Ha	

The land suitably certificate, non-encumbrance, non-encumbrance

certificate issued by the Tahasildar, Gundia, has been furnished (Page-302, 303/DP). The ACF Boneh Division has prepared a site-specific Compensatory Afforestation scheme. According to the scheme some patches contain Sal crop and its associates like Sal, Kendu, Gur, Bandoo, Agura, Brasi, Karada etc. are found in the identified patches. Therefore, the scheme has provision of RCF Plantation over 5.326 ha. The Scheme has also provision for Stone wall around the entire comp. aff. area. The species to be planted are Karanja, Simarouba, Neem, Amla, Bhada, Chitravan etc. The total financial outlay of the scheme is Rs.10,15,500/- (Page-255/DP). The User Agency has furnished an undertaking to bear the cost of the scheme (Page-252/DP).

8. Cost Benefit analysis

The total benefit of this proposal comes to Rs. **44.04** Crores. The loss on forests including environmental loss, N.P.V cost and other mandatory payments comes to Rs **0.5386228** Crores. Hence, the cost benefit ratio comes to

1 : 82

9. Safety Zone

An area of 0.562 ha. has been earmarked for Safety zone within the ML area. The details of area under Safety zone is as follows

Sl. No	Purpose of Safety Zone	Village Forest land (in ha)	PRF / DLC (in ha.)	Total forest land (in ha)	Non forest land (in ha)	Grand Total (in ha)
1	7.5m wide along lease boundary	-	0.327	0.327	0.308	0.632
2	50m wide along the river	-	-	-	1.380	1.380
3	10m wide along both side of the village road.	-	0.235	0.235	1.712	1.947
4	7.5 m wide along both side of the power line	-	-	-	0.392	0.392
	TOTAL :-	-	0.562	0.562	3.789	4.351

The Safety Zone area will be maintained as a green Belt. The User Agency has furnished an undertaking to bear the cost of maintenance of Safety Zone, and cost of Afforestation over 1.5 times the Safety Zone area in degraded forest land (Page-252/DP)

10. Environmental clearance

The User Agency has been granted Environmental Clearance vide Letter No SEIAA/217/ENV dt.16.4.2011 of SEIAA, Orissa (Page-270-274/DP)

11. Phased Reclamation Plan

The phased reclamation plan and afforestation scheme has been furnished at Page-253-258/DP. This plan includes reclamation of exhausted pits by back-filling with mine waste materials, taking up block plantation over the stabilized dump as well as vacant areas. The User Agency has furnished an undertaking to execute this work (Page-252/DP)

12. Mining Plan

The Mining Plan with Progressive Mine Closure Plan has been approved by the Indian Bureau of Mines vide their letter No MS/OTF MECH/26-ORI/BHU/2008-09 dt.29.12.2008 & Modified Mining Plan Letter No MPMOTF/MECH/21-ORI/BHU/2008-09 dt.18.12.2008 (Page-92-97/DP). The copy of approved Mining Plan with progressive Mine closure Plan is enclosed with the D.P.

Contd B

13. Lease profile

14. Violation

The User Agency has furnished the lease profile (Page-91/DP)

The M.L. is having forest land which was granted on 14.12.1988 without F.C. Act clearance which is a violation. Further, the Lessee has commenced mining operation in the PRF/C.L. land over 0.643 ha. when 5.888 ha. of forest land without prior approval of the F.C. Act 1980 as per Joint Verification report conducted on 20.9.2010 which is a violation of F.C. Act 1980.

15. Reassessment & Rehabilitation Plan.

The project does not involve displacement of any human habitation.

16. Others

The basic information of Boudi Division has been furnished at (Page-319/DP). The User Agency has furnished undertaking to pay the NFV (Page-252/DP). The Collector, Sundargarh has issued NDC under Forest Right Act 2006. The details of Gram Sacha negotiations along with English translations and NDC are enclosed at (Page-307-315/DP). The Check list as per prescribed format is duly filed in and enclosed in the DP (Page-1-9/DP).

17. Recommendation

In view of the above position 5.888 ha. of forest land including 0.562 ha. Safety Zone area (PRF/C.L. forest-5.888 ha.) is recommended for diversion in favour of M/s S. A. Haim for iron & Manganes ore mining. This proposal may kindly be transmitted further for approval under Section-2 of Forest (Conservation) Act, 1980. The Diversion Proposal is enclosed herewith in Particulate

End - As above

Divisional Forest Officer,
Boudi Division

Memo No. _____
Ref. To _____

Copy forwarded to the Chief Conservator of Forests, Forest Division & Nodal Officer, F.C. Act C/O the F.C.C.F. Chitra, Bhudamerwar for favour of kind information and necessary action with reference to the Memo No 9207/RF (MCJ-16/06 dt 31.3.2006).

Divisional Forest Officer,
Boudi Division

OFFICE OF THE DISTRICT MAGISTRATE & COLLECTOR
SUNDARGARH

Order No. 1788 / (Mining) Date 10.6.08 /

In pursuance of clause 2 of Part-III of mining lease deed executed between the Collector, Sundargarh and the lessee **Syed Abdul Halim** for **Iron and Manganese ore** over an area of **Ac.63.87** or **25.847** hecets. in Village- **Oraghat** under **Bonai** Sub-division of Sundargarh District, permission is hereby accorded for surface operation over an area of **Ac.1.63** as per the land schedule given below.

LAND SCHEDULE

Name of the Village	Khata No.	Plot No.	Name of the Tenant	Type of land	Area	Remarks
Oraghat	36	85	Rakshit	Unnat Jojana Jogyo	Ac 1.63	Full
				TOTAL	Ac 1.63	

The permission is subject to observance of terms and conditions of the lease deed and to the following namely.

1. The lessee shall pay rent and royalties in time.
2. The lessee shall report to the State Government regarding discovery of other mineral within 60 days and shall not win or raise the same until specific permission of Collector is accorded.
3. The lessee should take clearance from Divisional Forest Officer, Bonai Division before felling forest growth, if any.
4. The lessee shall have to pay the royalty of forest growth before felling tree for mining operation after due enumeration by the Forest Department.
5. The lessee shall not infringe the existing communal rights of the people of the locality, if any.


District Magistrate & Collector
SUNDARGARH

Order No. 1788 / (Mining) Date 10.6.08 /

Copy forwarded to the **Deputy Director of Mines, Kolra** for information and necessary action. He is requested to handover the granted area to the lessee under information to this office.

Copy to **Divisional Forest Officer, Bonai Division / Tehsildar, Bonai** for information and necessary action.


District Magistrate & Collector
SUNDARGARH


CHANDRABHANU DAS
RGP/BSN/52/2014/A

✓
Memo No. 1794 (Mining) Date 10.6.08

Copy forwarded to Syed Abdul Halim, At/PO- Bangul
Dist-Muzaffargarh for information and necessary action. They are
requested to abide by the terms and conditions as well as pay the rent and royalty in
time.


District Magistrate & Collector
SUNDARGARH

In pursuance of Order No.2924 dt. 18.10.08 of the District Magistrate and Collector, Sundergarh, I Sri Dillip Kumar Parija, Mining Officer, Koira do hereby handover possession of surface right over 4.52 acres within the lease hold area of 83.87 Acres or 25.84% parts of Syed Abdul Halim in village Oraghat under Bura Sub-Division of Sundergarh district in the following land schedule to Sri Karnakeswar Panda, General Manager on behalf of Kamalakanta Samal, Power of Attorney of Syed Abdul Halim on behalf of the Deputy Director of Mines, Koira.

SCHEDULE OF LAND

Khata No.	Plot No.	Kotam	Name of the Tenant	Area in Acres
18	24p	Goda-II	A.J.A.	0.25
18	161	Goda-II	A.J.A.	0.72
18	178	Goda-II	A.J.A.	0.34
18	187	Goda-II	A.J.A.	1.12
18	188	Goda-II	A.J.A.	1.16
18	194	Goda-II	A.J.A.	0.91
18	21Wp	Goda-II	A.J.A.	0.02
TOTAL				4.52 Acres

TAKEN OVER POSSESSION

HANDED OVER POSSESSION

Karnakeswar Panda
(Karnakeswar Panda)
General Manager,
On behalf of Kamalakanta Samal
P.A. Holder of Syed Abdul Halim.

18/11/09
(Dillip Kumar Parija)
Mining Officer, Koira.

Witness:-
Rajendra Nath, Sr. Surveyor
F.I.D.

Witness:- *26/11/09*

K. R. Panda, Manager
w.s. Oraghat Sundergarh Mines. *6/1/09*

CHANDRASHANU DAS
RQP/BS/052/2004/A

In pursuance of Order No. 352/1948, dt. 15.3.48 of Director, Bundarghat on this day the 23rd Sept. 1948, Mr. Sri Rajyashankar, Deputy Director of Mines, Kaira, has hereby deliver possession of Surface right over 3.51 acres granted within A. over 53.07 acres or 25.047 acres in the village - Gughat under Jamal Sub-division of Bundarghat district detailed of land schedule are given below to the Lessor, S. A. Halli for surface operation.

Particulars of Land Schedule.

<u>Village.</u>	<u>Plot No.</u>	<u>Block No.</u>	<u>Rate of the Tenants.</u>	<u>Kind.</u>	<u>Area in Acres.</u>
Gughat	83	20	Buddha Pund.	Gadali	0.87
	84	20	-do-	Charbari	0.83
	86	9	Gadali Pund.	-do-	0.26
	87	9	-do-	-do-	0.82
	88	9	-do-	Gadali	0.87
	89	9	-do-	Charbari	0.96
	92	30	A. J. A.	Gadali	0.62
	90	30	-do-	-do-	0.47
	354	30	-do-	-do-	0.13

Total = 3.51 acres

TAKEN OVER POSSESSION.

MAILED OVER TO POSSESSION.

(S. A. Halli)

Lessor.

For DEPUTY DIRECTOR OF MINES

KAIRA.

Witness :-

1. Rajyashankar, S. A. Surveyor

2. Sanat Kumar Baid

At 23/9/48.

For DEPUTY DIRECTOR OF MINES
CHANDRASHANU DAS
RQPIBBS/1627304A



समान चोखत देना करने हेतु
चौगुण व्यक्ति के रूप में
सम्पत्ति का प्रमाणपत्र

(संविन विधायक नियमावली, 1960 के नियम 22(घी) के अंतर्गत)

को CHANDRABHANU DAS

का श्री. सुकुमारचंद्र मुखर्जी

निवासी P/35 - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

इस व्यक्ति को चोखत देना और संपत्ति का सही तरह का प्रमाण प्रस्तुत करने के लिए संपत्ति
संविन विधायक नियमावली, 1960 के नियम 22(घी) के अंतर्गत उसे संपत्ति का
चोखत देना करने हेतु चौगुण व्यक्ति के रूप में संपत्ति प्रमाण की जाती है ।

इसका संविन क्रमांक

RQP/BS/DS/1/1004/A

है ।

यह संपत्ति दिनांक 30.08.2014

को संपन्न

होने वाली है।

होने वाली है। यदि कोई व्यक्ति के लिए है ।

स्थान : Chandrabhanu Das

दिनांक : 31.08.2014

Chandrabhanu Das

संविन सचिव नियमक

संविन सचिव नियमक

Chandrabhanu Das

Chandrabhanu Das
RQP/BS/DS/1/1004/A

OFFICE OF THE DIVISIONAL FOREST OFFICER, BONAI DIVISION

Ph/Fax -06628-244434 : E-mail dfobonai@rediffmail.com

No. 354 /BF-Dt 15/02/10

To:

Mr. S. A. Halm, Barbil.
(Oraghat Iron and Mn. Mines - 25.847 ha.)

Sub:

Closure notice of Mines.

Ref:

This office letter No.353 dt.22.01.2010 &
your Letter No.219 dt.30.01.2010.

Sir,

On scrutiny of your above show cause reply, it is observed that you have not obtained Final approval under F.C. Act'1980 and environmental clearance from MoEF, Govt. of India so far. Your lease constituted both forest and non-forest land. As per guideline Para-4.4 issued by MoEF, Govt. of India, the working in non-forest land is violation under F.C. Act'1980.

You are therefore requested to please close the mining operation in the above lease with immediate effect.

Yours faithfully,

15/02/10
Divisional Forest Officer,
Bonai Division

Memo No. 354 /BF-Dt

Copy forwarded to the Dy. Director of Mines, Koda for information and necessary action in continuation of this office letter No.355 dt.22.1.2010.

//
Divisional Forest Officer,
Bonai Division.

Memo No. 356 /BF-Dt

Copy forwarded to the Range Officer, Koda for information and necessary action in continuation of this office letter No.356 dt.22.1.2010. He is requested to report the date when the mining operation was commenced in the non-forest land and the date of closure.

//
Divisional Forest Officer,
Bonai Division.

BY REGISTERED A/D**ORDER OF SUSPENSION OF MINING OPERATIONS**

भारत सरकार
उद्योग विभाग
भारतीय खनिज आयोग
www.mines.nic.in
(bbsurda@nic.in)



Government of India
Ministry of Mines
Indian Bureau of Mines
Office of the Regional Controller of Mines
Ph-(0674)2742463 / Fax-0674 2744430

File No. H/11021/2/2010-BBS

Mahani Complex, 2nd Floor
308, District Centre
Chandrasekharpur
Bhubaneswar-751 016
Dated:- 25.08.2010

To
Shri Syed Abdul Halim, Mines Owner
Basil Road
AsPO- Barbil
Dist- Keonjhar
PIN - 758035

Subj: Order of suspension of mining operations under Rule 13 (2) of Mineral Conservation and Development Rules 1988 in respect of Oraghat Iron & Manganese Mine over an area of 25.847 ha in Sundargarh district, Orissa.

Sir

Please refer to the inspection of your above mentioned mine carried out by a team of Task Force consisting of Shri G C Meena DCOM and Shri B L Gurjar ACOM & member on 10/8/2010 accompanied by Shri Chander Sekhar Jena, Mines Manager of your Mine and Shri Bakata Bhandhu Patra, Sr Inspector of mines, Kolra, DMG Government of Orissa.

It was found during the inspection that the following mining operations carried out in the mine were not in accordance with the scheme of mining approved vide IBM letter dated 24.12.2008 and thereby violating the provisions of Rule 13 (1) of the MCDR 1988.

S. No.	Nature of Deviations observed from mining scheme approved vide Letter no MS/OTF/MECH/26-ORI/ BHU/ 2008-09 dated 29/12/2008 are given below.
Rule No 13(1)	1) In para 3.4, it was proposed to drill 5 nos of exploratory core holes during 2008-9 & 2009-10 whereas no such core drilling was carried out in lease area. 2) In para 52, Mining was proposed in pit no-1 for iron ore during the year 2009-10, but no mining operation is being done in pit no-1. 3) A new pit of 70m X 30m x 3m size for iron ore near mining lease boundary pillar B is excavated which was not proposed in approved scheme of mining. 4) There was proposals to produce 72,468 tonnes of iron ore during 2009-10 whereas 18,562 tonnes of iron ore is produced.

CHANDRASEKHAR DAS
RQP/BBS/052/2004/A

5) There was proposals to produce 3752 tonnes of Mn ore from Quarry no-5 during 2009-10 whereas no Manganese production is carried out. In para 9.8, it was proposed to plant 1013 nos of sapling in safety zone area during the year 2009-10 whereas no such saplings were planted in mining lease area.

In this regard, the task force of Indian Bureau of Mines has recommended for suspension of mining operations considering the nature of violations Rule 13 (1) of MCDR 1988 as indicated above.

I am of the opinion that the non-compliance of the Rule 13(1) of MCDR 1988 defeats the very purpose of systematic development of mines, conservation of minerals and protection of environment. Therefore, by virtue of the powers conferred upon me under Rule 13(2) of MCDR 1988, I hereby order suspension of all mining operations in the entire lease area with immediate effect.

No mining operations should be carried out in above mine/ quarry except the operations as may be necessary to restore the conditions in the mine as envisaged in the approved mining plan.

This order shall remain in force until revoked in writing. After compliance of the provision of Rule 13(1) of MCDR 1988 you may apply to this office for revocation of this order.

An immediate acknowledgement of this order is requested.

Yours faithfully,

 (S. Tilu)

Regional Controller of Mines

Cover forwarded for information and necessary action to:

1. Shri Shri Chander Sekhar Jena, Mines Manager, Oraghat Iron & Manganese Mine
 M/o S.A.Halim,At-Oraghat PO: Patmunda, Dist: Sundargarh Orissa.
2. The Director of Mines, Directorate of Mines, Government of Orissa, Bhubaneswar, PIN-751 001.
3. The Deputy Director of Mines, Directorate of Mines, At & P.O. Koira, Dist. Sundargarh, Orissa, PIN-758034, with a request not to allow despatch from the mine till revocation of this letter.
4. The District Collector, At & P.O.-Sundargarh, Dist- Sundargarh (Orissa)
5. The Director of Mines Safety, Chaibasa Region, At & P.O.- Chaibasa, Dist. Singhbhum-West, Jharkhand, PIN-833201.
6. The Regional Director, MOEF, Government of India, Bhubaneswar.
7. The State Pollution Control Board, Government of Orissa, Bhubaneswar.

(S. Tilu)
 Regional Controller of Mines

CHANDRABHANU DAS
 RQPIBBS/052/2004/A

BY REGISTERED A.D.

ଅନୁମତି ପ୍ରାପ୍ତ
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ଅନୁମତି ପ୍ରାପ୍ତ



Government of India
Ministry of Mines
Indian Bureau of Mines
Office of the Regional Controller of Mines
Ph-(0574)2742463 / Fax-0574 2744430

File No. H/11021/2/2010-BBS

Maharaj Complex, 2nd Floor
108, District Centre
Chandrasekhar
Bhubaneswar-751 016

To

Dated: 11.01.2011

Shri Syed Abdul Halim, Mines Owner
Basti Road
At/PO- Barbil
Dist- Keonjhar
PIN - 758015

Sub: Revocation of Order of suspension of mining operations under Rule 13 (2) of Mineral Conservation and Development Rules 1988 in respect of Oraghat Iron & Manganese Mine of Shri S A Halim over an area of 25.447 ha in Sundargarh district, Orissa.

Ref: (i) This office letter of even number dated 25.08.2010.
(ii) Your letter no: Nil dated 08.03.2010.

S/-

Please refer to the order of suspension of mining operations issued to you vide this office letter No H/11021/2/2010-BBS dated 25.08.2010 in respect of your mine and you were asked to rectify the violations pointed out therein.

Vide your letter No. Nil dated 08.03.2010, addressed to the Regional Controller of Mines, Indian Bureau of Mines, Bhubaneswar, you had made a request to revoke the suspension order, submitting therewith compliance report after approval of the modification to the Approved Scheme of Mining, with due incorporation of the rectifications in the relevant chapters pointed out in the Order of

CHANDRADHARU DAS
RQP/BBS/0520304/A

suspension on 25.08.2010. Shri S Chakraborty, AMG, has duly examined the document for its compliance. Subsequently the modification to the Approved Scheme of Mining has been approved by this office vide letter no MSM-OTF-MECH/61-ORI/BHU/2010-11 dated 07.03.2011.

Based on the examination of above facts and the recommendation of the Task Force Team leader, I am reasonably satisfied with the compliance of Rule 11 (1) of MCDR 1988 and here by revoke the order of suspension with immediate effect.

An immediate acknowledgement of this order is requested.

Yours faithfully,

Sd/
(S. TIL)

Regional Controller of Mines

Copy forwarded for information and necessary action to:

1. ✓ Shri Shri Chander Sekhar Jena, Mines Manager, Oraghat Iron & Manganeese Mine M/s S A Halim At-Oraghat PO, Patmunda, Dist. Sundargarh Orissa.
2. ✓ The Director of Mines, Directorate of Mines, Government of Orissa, Bhubaneswar, PIN-751 001.
3. ✓ The Deputy Director of Mines, Directorate of Mines, At & P.O. Koira, Dist. Sundargarh, Orissa, PIN-758034, with an advice to allow dispatch from the mine.
4. ✓ The District Collector, At & P.O.-Sundargarh, Dist- Sundargarh (Orissa).
5. ✓ The Director of Mines Safety, Chaibasa Region, At & P.O.- Chaibasa, Dist. Singhbhum-West, Jharkhand, PIN-833201.
6. ✓ The Regional Director, MOEF, Government of India, Bhubaneswar.
7. ✓ The State Pollution Control Board, Government of Orissa, Bhubaneswar.



Regional Controller of Mines

CHANDRABHANU DAS
RQPIBSS/05720001A

OFFICE OF THE DEPUTY DIRECTOR OF MINES, KOIRA CIRCLE, KOIRA,
DIST: SUNDARGARH.

No. 38106 /Mines, dt. 15-4-11
From

The Deputy Director of Mines,
Koira Circle, Koira.

To
Syed Abdul Halim
Mine Owner, Oraghat Iron/Mn. Mines.

Subj: Permission for operating Oraghat Iron/Mn. Mines in the Non-forest area over 3.857 hecta within the ML area.

Sir,

With reference to the subject cited above, You are hereby allowed to work in non-forest & Surface Right area over 3.857 Hecta within your ML area of Oraghat Iron/Mn. Mines further you are instructed to fence the Non-forest area & submit copy of the plan of the working section exhibiting forest & non-forest land clearly in every quarter commencing from Sept'2011.

Yours faithfully,


15-4-11
Deputy Director of Mines, I/c
Koira Circle, Koira.

Memo No. _____ /Mines dt. _____
Copy to Sri. A.K. Giri S.I.M concerned for information & necessary action. He is directed to monitor the working and ensure that before issue of transit permit no ore is raised from beyond the non-forest S/R area.

11
Deputy Director of Mines, I/c
Koira Circle, Koira.


CHANDRABHANU DAS
RQP/BS/052/7904/A

OFFICE OF THE DEPUTY DIRECTOR OF MINES, KOIRA CIRCLE, KOIRA
Dist: Sundargarh

ANNEXURE - VIII

ANNEXURE VII

Letter No. _____ Mines/dt _____

To

The Mines Manager, Oraghat Iron & Manganese Mine,
OFS-A Halim.

Subj: Irregularities observed during verification of your lease details in
respect of Oraghat Iron & Manganese Mines Over 25.847 heccts in Dist-
Sundargarh.

Dear Sir,

You are hereby intimated that during verification of records in respect of
the above mentioned leasehold, the following discrepancies were noticed.

- (i) You have not obtained Environment Clearance for working the mine before
dt.16.04.11. Therefore the entire production from the mine since its opening till
15.04.11 is not permissible under the Environment (Protection) Act-1986 & rules
made thereunder.
- (ii) you have not obtained consent to establish & consent to operate under Water
(prevention & control of pollution) Act & Air (prevention & control of pollution)
Act. from the GSPCB till dt.13.05.19.

Therefore, the entire production from the date of commencement till
dt.12.08.09 is in violation of the said Acts & rules made thereunder. Further you have
not undertaken review of mining plan for the period from 2003-04 to 2007-08 which
amounts to contravention of the provision of the MCDR, 1988.

You are, therefore, requested to explain why action as permissible under
law will not be initiated against you for the above violations? You are requested to
discontinue mining operation until satisfactory compliance to the above violation is
made.

Yours faithfully,

Deputy Director of Mines, I/C
Koira Circle, Koira

Memo No. 42-108 /Mines Dt. 16/8/11
Copy to the Director of Mines Odisha, Bhubaneswar for kind information and necessary
action.

Deputy Director of Mines, I/C
Koira Circle, Koira

Memo No. _____ /Mines Dt. _____
Copy to the Mining Officer/S.I.M for information and necessary action.

Deputy Director of Mines, I/C
Koira Circle, Koira

CHANDRASHANKU DAS
RQPIBBS/052/2004/A

OFFICE OF THE DEPUTY DIRECTOR OF MINES, KOIRA CIRCLE,
DIST. SUNDARGARH

No. _____/Mines, dt. _____/2013

In pursuance of the Director of Mines, Odisha, Bhubaneswar Letter No-6435/DM, Dt.26.05.2012 after examination of compliance submitted by the lessee in respect to the irregularities observed during verification of lease details & notice of discontinuance of Mining operation issued vide this office Letter No-42105/Mines Dt.26.11.2011 in respect of Oraghat Iron/Mn Ore Mines over 25.847 Hectrs, the scrutinizing committee examined the statutory clearances submitted by the lessee due regards to all statutory clearance and findings are as follows:

Where as the mines has the consent from the OSPCB, Odisha valid upto 31.03.2013.

Where as the Mining Scheme has been approved from the IBM i.e competent authority which is valid upto 31.03.2013.

Whereas the L.I. issued by the SETAA, Odisha vide letter No-SETAA/717ENVY Dt.16.04.2011 is for 72864 TPA Iron and 7563 TPA for Mn Ore per annum.

Where as the lessee company through his agent has submitted an undertaking that, he will abide by the decision of the Forest and Environment Deptt. with regards to the post violation under F.P. Act.1986. The Lessee has already deposited NPV over 5.888 Ha. forest land.

In consideration above i.e. valid authority obtained in respect of Oraghat Iron/Mn Mines, The Lessee S.A. Halim is allowed to undertake mining operations in the Non-forest area over 4.88 Acres covering plot No-82,83,84,85,86,87,88,89 & 90 granted under surface right upto 31.03.2013 as the mining scheme and consent to operate are valid upto 31.03.2013.

Yours faithfully,
Deputy Director of Mines,
Koira Circle, Koira

Memo No- 633 Mines Dt. 19/2 2013

Copy to S.A. Halim, Mine owner for information & Necessary action.

Deputy Director of Mines,
Koira Circle, Koira

Memo No. _____/Mines Dt. _____/2013

Copy to the concerned Mining officer, Koira/Concerned Senior Inspector of Mines for information & Necessary action.

Deputy Director of Mines,
Koira Circle, Koira

VIOLATION LETTER

REGD/A.O.

ପ୍ରତି ଶ୍ରୀମତୀ
ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ
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ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ



Governments of India
Ministry of Mines
Indian Bureau of Mines
Office of the Regional Controller of Mines

File No. ODMMS-1/REGD/A.O. 27/888	Maham Complex, 3 rd Floor 304, District Centre, Chandrasekharpur Bhubaneswar-751 016 Ph-(0674)2742463 / Fax-0674 2744835
To	Date: 29.11.2011

Shri Syed Abdul Hakeem, Mine owner
Oraghat Iron & Manganese Mines
Basti Road, At-Pn (Basti)
Dist-Koraput, Orissa-758005

Sub: Violation of provisions of MCDR, 1988 in respect of Oraghat Iron & Manganese Mines
Q5.947 to: Shri Syed Abdul Hakeem in Koraput District of Orissa State.

Sr:
The following provisions of Mineral Conservation and Development Rules, 1988 were found violated in or above said mine during inspection on 27.09.2011 by the undersigned and accompanied by Mr. P. K. Dasgupta, Licensing Officer & S. K. Panda, Mine Geologist.

Rule No.	Nature of Violation
(31)	Mining operations are not being carried out in accordance with the approved modified Scheme of Mining letter dated 06.07.2010 to the extent indicated below:- i. Excavation as proposed for the year 2010-11 (09 BHs) was not carried out ii. Near boundary pillar A, a pond was found which has disturbed the boundary pillar A, thereby working within the safety zone.
(31A)(i)	A full time mining engineer and geologist, as required under the provision of amended rule has not been employed.

(2) In this connection, it is brought to your notice that the above violations constitute an offence punishable under rule 58 of MCDR, 1988.

(3) You are advised to rectify the above violations immediately and intimate the position to this office within 45 (forty-five) days from the date of issue of this letter.

Yours faithfully,

Ibrahim Sharif 29/11/11

SHRI IBRAHIM SHARIF

Regional Assistant Controller of Mines

Syed Abdul Halim

Mines Owner

At / Po : Barbil, Dist-Keonjhar

To
The Assistant Controller Of Mines
Indian Bureau Of Mines
Mahani Complex, 2nd Floor, 308,
District Centre, Chandrasekharpur,
Bhubaneswar.

Ref: Your letter no- OBMEN/ENGMCDR/27/IBBS, dt-29/11/11

Sub: Violation of provision of MC DR, 1988 in respect of Oraghat Iron & Manganeze Mines of Syed Abdul Halim, Sundergarh, Odisha.

Dear Sir,

With reference to your above letter, we are submitting following flow chart for your kind consideration & necessary action.

1. As per proposal of approved scheme of mining we have completed 17 nos. D/H borehole within the lease area. And there was proposal for 11 nos. of D/H borehole as per the approved modification of mining scheme. The mine is not in operation since Feb-2011. There fore it was not possible in our part to drill the above mentioned 9 nos. borehole. However this task log will be completed by an resuming of mines operation.
2. Boundary pillar of "A" our lease hold comes under plot no-257 Khata no-11. During the lease declaration this plot could not be demarked due to presence of a waste dump of ORAGHAT IRON MINE'S. M/s Rungta Sona Pvt. Ltd. it was brought to the notice of ministry & local authorities. This was also brought to the notice of mines manager of Oraghat Iron Mines, Oraghat 2008. We are informed by M/s Rungta Sona (pt) Ltd. that the said plot has been purchased by them.

Subsequently the dump was shifted by m/s Rungta Sona (pt) Ltd. and in that place they have made a pond for storage of rain water during the financial year 2010-11. We have ignored of this development as our mine was not in operation in that period. However this was mention to the inspecting officer of IBMI on dat 27/04/2011 during his MC DR inspection and official of M/s Rungta Sona (pt) Ltd. were instructed to settle the matter amicably.


CHANDRABHANU DAS
RQP/IBBS/052/2011/A

Syed Abdul Halim

Mines Owner

At / Po. : Barbil, Dist-Kaonjhar

We have not made any mining or retorted operation near pillar "A" and the existing pond has been constructed by Mrs. Hungta Sora (p) Ltd.

A whole time mining engineer Mr. C. S. Jena & a geologist Mr. J.K. Nath employed in the mine. They left services after closure of our mine in Feb-2010. Two (2 nos) mining foreman Mr. Pokash Nath & Mr. Fakir Chagan Kapi are still continuing their service for the mine. The full time mining engineer & geologist will be employed before resuming of mines operation.

This is for your kind information & necessary action.

Thanking You

Yours Faithfully

For M/s. Syed Abdul Halim

Kanaka Kantu Samal
Agent

Oraghat Iron & Manganese Mine,
Oraghat, Sundergarh



भारत सरकार / GOVERNMENT OF INDIA

खान मंत्रालय / MINISTRY OF MINES

भारतीय खान बोर्ड / INDIAN BUREAU OF MINES

क्षेत्रीय खान नियंत्रक का कार्यालय / OFFICE OF THE REGIONAL CONTROLLER OF MINES

No. ORIMN/SNG/MCDR-27/BBS

Mahani Complex, 2nd Floor
308, District Centre, Chandrasekharpur
Bhubaneswar - 751 016

Date: 24.10.2013

To

Sri Syed Abdul Halim, Mine Owner
Oraghat Iron & Mn Mines
At/P.O- Barbil, Dist- Keonjhar
Odisha- 758035

Sub: Violation of provisions of MCDR, 1988 in respect of Oraghat Iron & Mn Mine over an area of 25.847 ha in Sundergarh district of Odisha State.

Sir,

On scrutiny of office record the following provision of Mineral Conservation and Development Rule, 1988 (MCDR'88) found violated in respect of the above mine.

Rule	Violation
13(1): Mining operations to be in accordance with mining plans: - (1) Every holder of a mining lease shall carry out mining operations in accordance with the approved mining plan with such conditions as may have been prescribed under sub-rule (2) of rule 9 or with such modifications, if any, as permitted under rule 10 or the mining plan or scheme approved under rule 11 or 12 as the case may be.	As per the condition mentioned at Sl no. XIII in the approval letter of the approved Mining Plan/ Scheme of Mining along with Mine closure Plan, the lessee should submit yearly reports as per rule 23-(E)-(2) of MCDR-1988 to the Regional Controller of Mines. Till date no such report has been submitted, resulting in violation of the approval of the Mining Plan/ Scheme of Mining.
Rule 23 (E) (2): The owner, agent, manager or mining engineer shall submit to the Regional Controller of Mines or the officer authorized by the State Government in this behalf, as the case may be, a yearly report before 1st July of every year setting forth the extent of protective and rehabilitative works carried out as envisaged in the approved mine closure plan, and if there is any deviation, reasons thereof.	The yearly report on extent of protective and rehabilitation works carried out as envisaged in the approved mine closure plan for the year 2012-13 has not been submitted to the Regional Controller of Mines, IBM, Bhubaneswar till date.

CHANDREKHANU DAS
RQ/BBS/052/2304/A

CHANDRAN SHANU DAS AGRIWATER PROPOSAL STATE OF PROTECTIVE MEASURES, ESTIMATES FOR ENVIRONMENTAL PROTECTION IS SUBMITTED THE YEAR 2024

Item	Description	Quantity			Rate			Amount		
		Unit	Qty	Rate	Unit	Qty	Rate	Unit	Qty	Rate
A) Rehabilitation and Maintenance of River and Canal	1. Bedding	sq. ft.	100	100	100	100	100	100	100	100
	2. Construction of the bed and sides of the canal (gross spec) as shown in attached drawing	sq. ft.	100	100	100	100	100	100	100	100
	3. Bedding	sq. ft.	100	100	100	100	100	100	100	100
	4. Bedding	sq. ft.	100	100	100	100	100	100	100	100
	5. Bedding	sq. ft.	100	100	100	100	100	100	100	100
B) Rehabilitation of River and Canal	1. Bedding	sq. ft.	100	100	100	100	100	100	100	100
	2. Construction of the bed and sides of the canal (gross spec) as shown in attached drawing	sq. ft.	100	100	100	100	100	100	100	100
	3. Bedding	sq. ft.	100	100	100	100	100	100	100	100
	4. Bedding	sq. ft.	100	100	100	100	100	100	100	100
	5. Bedding	sq. ft.	100	100	100	100	100	100	100	100
C) Rehabilitation of River and Canal	1. Bedding	sq. ft.	100	100	100	100	100	100	100	100
	2. Construction of the bed and sides of the canal (gross spec) as shown in attached drawing	sq. ft.	100	100	100	100	100	100	100	100
	3. Bedding	sq. ft.	100	100	100	100	100	100	100	100
	4. Bedding	sq. ft.	100	100	100	100	100	100	100	100
	5. Bedding	sq. ft.	100	100	100	100	100	100	100	100

THE PAN CARD PERMANENT ACCOUNT NUMBER AAOPHS389C		
	PAN CARD SAYED ABOUL HALIM	
PAN OF THE FATHER'S NAME SAYED ABOUL QADIR		
PAN PAN DATE OF BIRTH 29-12-1960		
SIGNATURE 	 CHANDRABHANU DAS COMMISSIONER OF INCOME TAX, CHANDRABHANU	

BHARAT SANCHAR NIGAM LIMITED KONJHAR TELECOM DISTRICT

INNEVURE

Bill Month: April 2013
Billing Cycle: Monthly
Bill Date: 01/04/2013

NAME AND ADDRESS OF THE CUSTOMER
BANDU KUMAR T. SAHU
BAGRI, BASTI ATPO BAHUL
UT KONJHAR
OR
768008

Customer ID: 3000486104
Phone Number: 94767378020
Bill Number & Date: 105167581 - 05/04/2013
Bill Period: 01/03/2013 to 31/03/2013
Payment Due Date: 29/04/2013
Customer Type: INDIVIDUAL
Credit Limit:

Account Summary (in Rupees)

Previous Balance Current Total	Previous Statement	Service Amount	Adjustments	Original Bill Amount	Amount Payable Amount Billed
0.00	0.00	861.29	0.00	861.29	1,178.00

Late Fee and Penalty: 2% of the outstanding amount pending after Pay By Date. Maximum Late Fee 2% of 1,178.00 = 23.56

Summary of Charges	Amount (₹)
Monthly Charges	370.00
Usage Charges	18.00
One Time Charges	0.00
Discounts	-18.00
Service Tax	45.73
Late Fee	10.00
Total Charges (₹)	425.73

NAME OF THE CUSTOMER
BANDU KUMAR T. SAHU
ADDRESS
BAGRI, BASTI ATPO BAHUL
UT KONJHAR
OR
768008



Destination	Tax Rate	Amount
Service Tax	5.30%	44.40
Education Cess	2.00%	8.88
Health Cess	1.00%	4.44

Accounts Officer (TR)
Signature of Accounts Officer and Seal with
Mandatory Stamp

If you prefer free payment mode - call for
CCS or pay 5/10 amount at www.bsnl.co.in

*With effect from 1.2.2013 onwards, the
Annual Payment Option for New Greenfield
Connections revised with Four Monthly

CHANDRABHANU DAS
RQP/BSN/52/2064/A

भारतीय नैऋत्यिक

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RENT AGREEMENT

This rent agreement is made and executed at Bhubaneswar, Odisha on this 15th day of September, 2012 between Mrs. Jayashree Saha W/o Mr. Mihir Kumar Saha, aged about 41 years R/o Flat No. ~~10/202~~ Kallachakra Apartments, Cutback Road, Bhubaneswar, Dist.- Khurda, Odisha of the first part, hereinafter called the FIRST PARTY/OWNER

Jayashree Saha

AND

Mr. Sayed Abdul Halim, S/o Mr. Sayed Abdul Qadir, aged about 37 years presently residing at Badi Road, Post: Barbat, Keonjhar, Odisha of the Second Part, hereinafter called the SECOND PARTY/TENANT.

The expression of the terms here by means and includes their respective heirs, Nominees assign etc.

WHEREAS the first party is the owner and in peaceful possession of commercial property at Room No. 17/23, 2271, Bhowal Commercial Complex, Cutback Road, Bhubaneswar, Dist.- Khurda, Odisha (hereinafter referred to as "PREMISES").

AND WHEREAS the Second Party desirous of taking the property on rent and requested to the First Party for the same and the First Party has agreed to let out the Premises to the Second Party on the terms and understandings put in writing and signed hereafter.

Jayashree Saha

CHANDRABHANU DAS
RQP/BS/053/2064/A

Now this Rent Agreement witnessed as under:-

1. That the second party shall pay a sum of Rs. 4,500/- (Rupees Four Thousand Five Hundred Only) per month to the first Party as rent of the said premises on or before the 7th day of succeeding month.
2. That the tenancy period of the second party in the above said property will be for 1 (Three) Years from this date as initial committed period.
3. That the second party will be spending significant amount in the interior and fittings, the first Party cannot evict the tenanted premises before completion of initial committed period of the 1 Years from this date.
4. That if the second party wants to continue the occupancy after three Years in the said premises, then in that event the tenancy period will be extended by the permission of the first party. The Tenancy Period can be extended further with mutual consent on such terms and conditions as may be agreed upon between first party and second party.
5. That the first party will provide a space for putting DG set to the second party so as to ensure power back-up.
6. That the second party will also install, if required an antenna and dish for communication to which the second party will provide requisite space on the terrace. No tower shall be erected on the said premises.
7. That the second party will at all times be allowed to access the terrace for carrying out repairs to water tanks and also have access to the panel or junction box for managing their electricity repairs with prior permission from first party.
8. That the First Party will have to bear all the property tax and other statutory dues.
9. That the second party confirms that they have seen the said premises and inspected the same and has found to his satisfaction that the said premises is in good order and condition as per the requirements of the second party.
10. The second party shall in addition to the monthly Rent as aforesaid, pay all actual electricity charges as per the meter provided for the said property and water charges on pro-rata basis.
11. The second party agrees to maintain the property in good condition subject to reasonable wear & tear and not to cause any damage to the same. In the event that any damage is caused to the premises or any part thereof by the second party or his servants/agents, the same shall be made good by the second party either by rectifying the same or by paying compensation as may be determined by the first party.
12. The second party shall not carry out any work of the structural repairs or alterations to the said premises. Only such alterations that are not structural or permanent in nature may be allowed to be made by the second party after obtaining the previous permission of the first party.
13. The second party shall not store upon the said property any goods of hazardous combustible or inflammable nature.
14. The second party shall not do or cause to be done anything in or upon the said premises which may be a source of nuisance or annoyance to the neighbors of the said premises.

Jayashree Sahu


CHANDRABHANU DAS
R0YEBS/052/2004/A

15. That the second party shall be deemed to be only a tenant for the period of Three Years only by virtue of these presents and shall not make or have any claim to tenancy, sub tenancy or any other right title or interest of whatsoever nature in the said property or portion thereof. It is agreed between the parties here to that the second party shall not let out the said premises to any other party.
16. That the first party shall not be liable for any damage or injury to any person whatsoever or to any property whatsoever by short circuit, fire, rain leakage, breakage or bursting of the water pipe or electricity in the said premises or giving way of any portion of the flooring, wall, roof or any part of the said building from any cause whatsoever.
17. It is also hereby agreed between the parties that the first party or his duly authorized agents shall be allowed to enter and inspect the said premises at any time during the subsistence of the terms of the said agreement at any time during the day by giving the second party one day's prior notice of the same.
18. Any dispute arising out of this Agreement between the parties shall be resolved by the mutual understanding and discussion failing which the arbitration shall be enforced as per law.
19. This Rent Agreement is governed by the Local Laws in India and the Courts in New Bhubaneswar shall have the exclusive jurisdiction to try and dispute.
20. If the second party defaults in the payment of rent then it shall be lawful for the first party to terminate the rent agreement without prejudice to any claim, right or remedy after giving seven days notice of the lapse of payment of rent to the second party. In the case of this non-compliance event, it will be lawful for the OWNER to take over possession of the premises.
21. That the day to day repairs such as replacement of switches, fuses, leakage or change in water taps etc. shall be the responsibility of the second party at his own cost. But in case any damages to the structures due to rain or any other cause (not attributable to misuse or negligence on part of second party) shall be attended to and repaired by the first party at his own cost as soon as possible.
22. That if there will be any breach of the above said terms and conditions, the rent agreement shall be automatically terminated without any financial implication to the OWNER.

IN WITNESS WHERE OF, this rent agreement is executed at Bhubaneswar and both the parties have signed the said agreement in the presence of the following witnesses and the witnesses have signed in presence of both the parties herein Bhubaneswar on this day as mentioned hereinabove.

WITNESSES:-

1.

Jayashree Sahu
FIRST PARTY / OWNER



2.

SECOND PARTY / TENANT

CHANDRASHAKU DAS
RQP/BS/062/2804/A



MINING LEASE

for -

IRON & MANGANESE

IN FAVOUR OF

SRI SYED ABDUL HALIM*Executed on 20.6.98*Certified to be true copy
of the Original document

Debabrata Mishra

Notary Public

Regd. No-ON-03/2001

Dist-Keonjhar (Orissa)

Over an area of 63.37 acres or 25.847 hectares
in village ORACHAT of Sundergarh district - Orissa.CHANDRABHANGU DAS
RQP/BS/057/01M/A

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Registering Officer,
 District

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MODEL: FORM BY MINISTERS LAKE

(See this)



THIS INSTRUMENT made this 31st day of July

1972 between the Governor of Orissa / the President of India (hereinafter referred to as the State Government) and the undersigned shall where the context so admits be deemed to include the successors and assigns of the one or both parties.

Sayed Abul Hakeem, s/o Sayed Abul Kadir, A/c 101, Baroli, P.S. Baroli, Dist. Keonjhar, aged 50 years, as present residing at Baroli, Dist. Keonjhar, Occupation unknown (hereinafter referred to as 'the lessee') which provisions shall where the context so admits be deemed to include his heirs, executors, administrators, representatives and permitted assignees.

Certified to be true copy
 of the Original document.

Witnessed by

CHANDRASHANKAR DAS
 ROY
 SUNDARGARH

Deputy Minister
 Notary Baroli
 Regd. No. 114/27/1001

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Certified to be true copy
of the Original document

Debasree Mishra
Naryi Warhel
Regd No-ON-07/2001
Dist-Keonjhar (Orissa)

WHEREAS THE lessee has applied to the State Government its application with the Mineral Concessions Rules, 1960 (hereinafter referred to as the said Rules) for a mining lease for Iron and Manganese Ore in respect of the lands described in Part I of the Schedule hereunder written and has deposited with the State Government the sum of Rs. 2000/- as security and the sum of Rs. 1000/- for meeting the preliminary expenses for a mining lease; and WHEREAS THE Central Government has approved the grant of lease;

WITHIN THE scope of consideration of the lease and royalties, conditions and agreements by and between these presents and the schedule hereunder written reserved and contained and on the part of the lessee to be observed and performed, the State Government with the approval of the Central Government hereby grants and assigns unto lessee.

IN WITNESS WHEREOF I have signed and placed my hand and seal at the Ministry of Mines & Minerals Regulation & Development, New Delhi, this 1st day of March 2001.

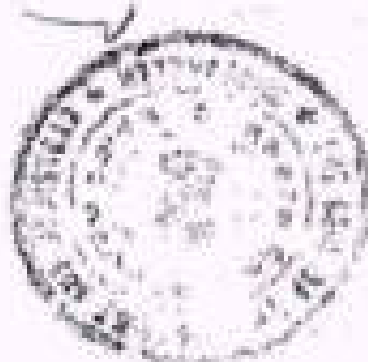
S. A. Halim

CHANDRABHANU DAS
RQP/BS/052/2004A

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DEPARTMENT OF THE INTERIOR
BUREAU OF LANDS
WASHINGTON, D. C.



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All lands in the following areas from & including 1st 12th October 1950 in the Schedule referred to as the said Schedule, situated lying and being in or about the lands which are referred to in Part I of the said Schedule, together with the liberties, powers and privileges to be exercised or enjoyed in connection herewith which are mentioned in Part II of the said Schedule subject to the restrictions and conditions as to the exercise and enjoyment of such liberties, powers & privileges which are mentioned in Part III of the said Schedule EXCEPT and reserving out of this devise unto the State Government the liberties, powers and privileges mentioned in Part IV of the said Schedule TO HOLD the premises above described and devised unto the lessee from the 1st day of April 1950 for the term of 99 years there next ensuing FIELDED and PAYING therefore unto the State Government the several rents and royalties mentioned in Part V of the said Schedule at the respective times therein specified subject to the provisions contained in Part VI of the said Schedule and the lessee hereby covenants

Certified to be true copy
of the Original Document.

CHANDRASHANU DAS

B. A. Haim.

Chandrashanu Das
Revenue Officer

Regd. No. 17/3001
Trib. Tribunal of Orissa

CHANDRASHANU DAS
RQ/BB/552/2000

1. 1. The first part of the document is a letter from the author to the reader, explaining the purpose of the study and the methods used.
 2. 2. The second part is a detailed description of the results of the study, including the data collected and the analysis performed.
 3. 3. The third part is a discussion of the results, comparing them to previous studies and discussing the implications of the findings.
 4. 4. The fourth part is a conclusion, summarizing the main findings and providing recommendations for future research.
 5. 5. The fifth part is a list of references, citing the sources used in the study.

11

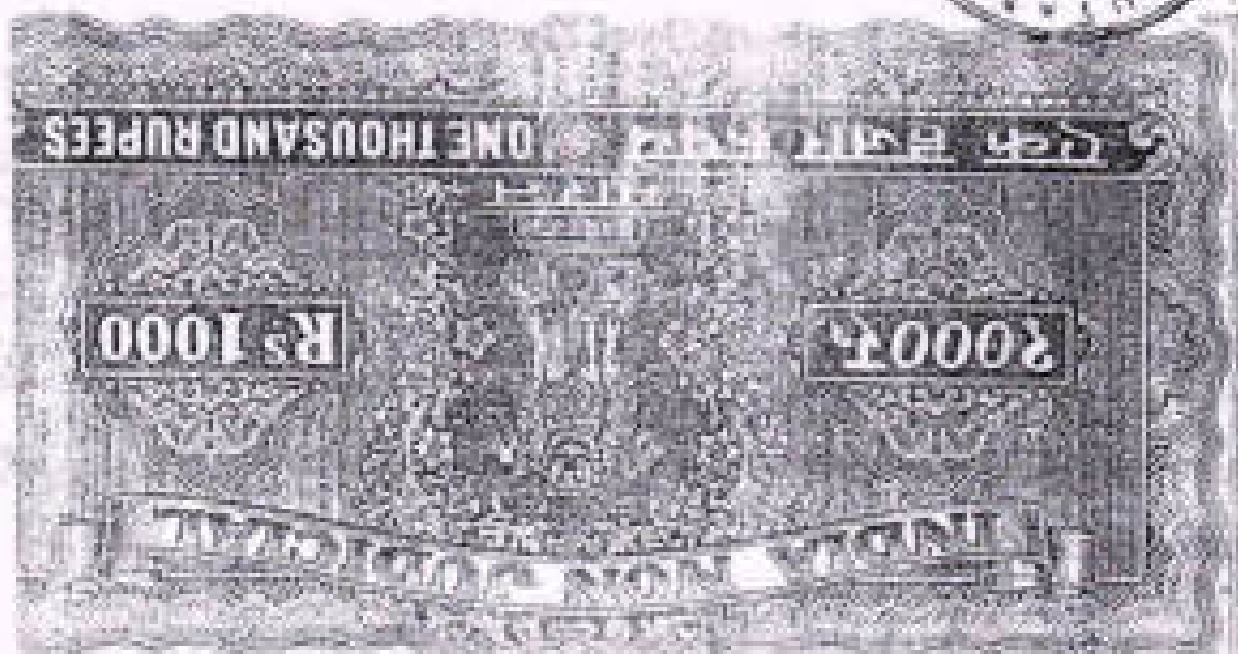
* 附註: 1. 本報告係根據 2013 年 12 月 31 日之資料編製。
2. 本報告係根據 2013 年 12 月 31 日之資料編製。
3. 本報告係根據 2013 年 12 月 31 日之資料編製。

15. *Journal of the American Medical Association*, 277: 1005-1006 (1997).

Received 10 July 2007; accepted 19 September 2007

ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED
DATE 08-19-2007 BY 60322 UCBAW

RECEIVED
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BOUNDARY SURVEY OF THE B.L. AREA LOCATED IN
PART OF THE AREA OF THE B.L. AREA FOR IRON & MANGANESE
ORE. THE SURVEY WAS DONE IN 1971 UNDER THE SUPERVISION OF
SUNDERAM DISTRICT OFFICE, 15, 147 HILLS ON 63.87 ACRES.
Reference: Topp Map of T. 34 No. 71 G/S
Scale: 1 : 50,000

Reference: Topp Map

The boundary of the B.L. area of village Bhatwara, Sanindapur and Bhatwara is shown in 1:50,000 scale map has been taken as the reference point of the area. The starting station 'A' on Station 'B' of the F.L. Area of M/s. National Enterprises lies on the Northern boundary line of the B.L. area of M/s. Bhatwara (P) Ltd. is situated at a distance of 10.1 km. or 101.112 meters and on a magnetic bearing of 291° 40' from the above noted reference point.

From Station 'A' the traverse starts and runs in anticlockwise direction as follows.

Station 'A' to Station 'B'
at the Bhatwara Bhatwara

Station 'B' to Station 'C'

[Signature]
E. A. Bhatwara

[Signature]
Bhatwara Bhatwara
Bhatwara Bhatwara
Bhatwara Bhatwara

[Signature]
Bhatwara Bhatwara
Bhatwara Bhatwara

[Signature]
CHANDRASHANU DAS
RQIBBS/052/2004/A

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1. *Journal of the American Medical Association*, 2000; 283: 2686-2692.



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ONE THOUSAND RUPEES



and covers for a distance of 2 - 41 = 315 ft or 96,012 sq. ft.
 H - I = 45 ft or 13,500 sq. ft., I - J = 100 ft or 27,012 sq. ft.,
 J - K = 450 ft or 135,000 sq. ft., K - L = 50 ft or 15,045 sq. ft.,
 L - M = 360 ft or 107,424 sq. ft., M - N = 30 ft or 9,144 sq. ft. and
 N - O = 40 ft or 11,712 sq. ft. The line H - I and L - M is
 common with the S.D. of M/s. Rangia Sons Pvt. Ltd.
SOUTHERN BOUNDARY

Starts from station 'O' and runs upto station 'A' the starting point through intermediate station O/I, making interior of 12 - 13 = 500 ft at station 'O' and runs for a distance of 2 - 1 = 1000 ft or 304,800 sq. ft. and O - A = 550 ft or 165,000 sq. ft. The O - A is common with the Northern Boundary line of the H.D. area of M/s. Rangia Sons Pvt. Ltd.

At last the boundary line forms an interior angle of 88400° at station 'A' and the area covering over 25,947 hectre of land was originally granted running in an antiockwise direction.

Thus the boundary is closed.

107-B.R.Bethi

18.11.77

Copy of the above report to be submitted to the District Surveyor, District of ...

1000B.../V/P.

(Signature) Madras

(Signature) Madras

24/11/77

Copy to be submitted to the District Surveyor, District of ...

B. A. Bhalim

CHANDRABHANUDAS
ROPIBBS/55700001A

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Year	Age	Sex	Weight (kg)	Length (cm)	Condition
1954	20	Male	12.5	110	Good
1954	19	Female	11.8	108	Good
1954	20	Male	13.2	112	Good
1954	17	Female	11.5	105	Good
1954	20	Male	12.8	110	Good
1954	19	Female	11.9	109	Good
1954	20	Male	13.0	111	Good
1954	19	Female	11.7	107	Good
1954	20	Male	13.1	112	Good
1954	19	Female	11.6	106	Good
1954	20	Male	13.3	113	Good
1954	19	Female	11.8	108	Good
1954	20	Male	13.4	114	Good
1954	19	Female	11.9	109	Good
1954	20	Male	13.5	115	Good
1954	19	Female	12.0	110	Good
1954	20	Male	13.6	116	Good
1954	19	Female	12.1	111	Good
1954	20	Male	13.7	117	Good
1954	19	Female	12.2	112	Good
1954	20	Male	13.8	118	Good
1954	19	Female	12.3	113	Good
1954	20	Male	13.9	119	Good
1954	19	Female	12.4	114	Good
1954	20	Male	14.0	120	Good
1954	19	Female	12.5	115	Good
1954	20	Male	14.1	121	Good
1954	19	Female	12.6	116	Good
1954	20	Male	14.2	122	Good
1954	19	Female	12.7	117	Good
1954	20	Male	14.3	123	Good
1954	19	Female	12.8	118	Good
1954	20	Male	14.4	124	Good
1954	19	Female	12.9	119	Good
1954	20	Male	14.5	125	Good
1954	19	Female	13.0	120	Good
1954	20	Male	14.6	126	Good
1954	19	Female	13.1	121	Good
1954	20	Male	14.7	127	Good
1954	19	Female	13.2	122	Good
1954	20	Male	14.8	128	Good
1954	19	Female	13.3	123	Good
1954	20	Male	14.9	129	Good
1954	19	Female	13.4	124	Good
1954	20	Male	15.0	130	Good
1954	19	Female	13.5	125	Good
1954	20	Male	15.1	131	Good
1954	19	Female	13.6	126	Good
1954	20	Male	15.2	132	Good
1954	19	Female	13.7	127	Good
1954	20	Male	15.3	133	Good
1954	19	Female	13.8	128	Good
1954	20	Male	15.4	134	Good
1954	19	Female	13.9	129	Good
1954	20	Male	15.5	135	Good
1954	19	Female	14.0	130	Good
1954	20	Male	15.6	136	Good
1954	19	Female	14.1	131	Good
1954	20	Male	15.7	137	Good
1954	19	Female	14.2	132	Good
1954	20	Male	15.8	138	Good
1954	19	Female	14.3	133	Good
1954	20	Male	15.9	139	Good
1954	19	Female	14.4	134	Good
1954	20	Male	16.0	140	Good
1954	19	Female	14.5	135	Good
1954	20	Male	16.1	141	Good
1954	19	Female	14.6	136	Good
1954	20	Male	16.2	142	Good
1954	19	Female</			

[illegible]

SOURCE: U.S. DEPARTMENT OF AGRICULTURE, NATIONAL RURAL EXPERIMENT STATION, ARS-156-007-0000

11. **RESEARCH DESIGN** The study was a descriptive, cross-sectional study. The study was conducted in the form of a survey. The study was conducted in the form of a survey. The study was conducted in the form of a survey.

UNIVERSITY OF CALIFORNIA, BERKELEY

एक हजार एक सौ रुपये

R\$ 1000

5000%

400R

R⁵ 500

FIVE HUNDRED RUPEES



Sl. No.	Particulars	Debit	Credit	Balance
157	25			
158	25			
159	30			
160	36			
161	38			
162	15			
163	15			
164	15			
165	37			
166	12			
167	12			
168	30			
169	30			
170	9			
171	9			
172	37			
173	37			
174	12			
175	1			

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B. A. Hellen

Dehabrata Mishra

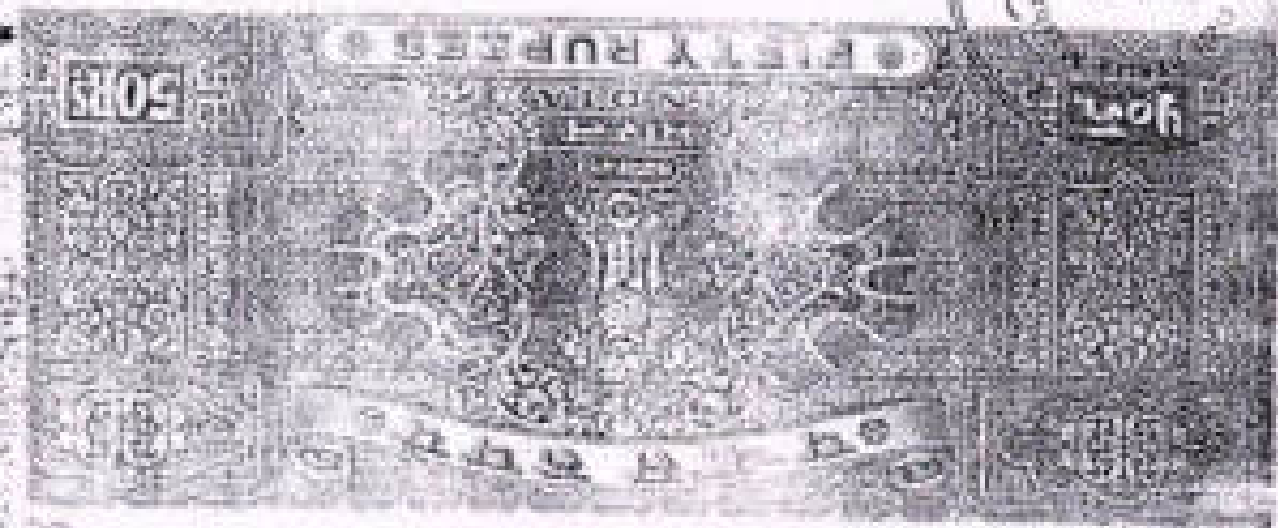
Notary Public

Regd. No. 140/2000

Dist. Kanchi - 1 (Dist. 3)

CHANDRABRANJ DAS

RQP/BS/052004/A



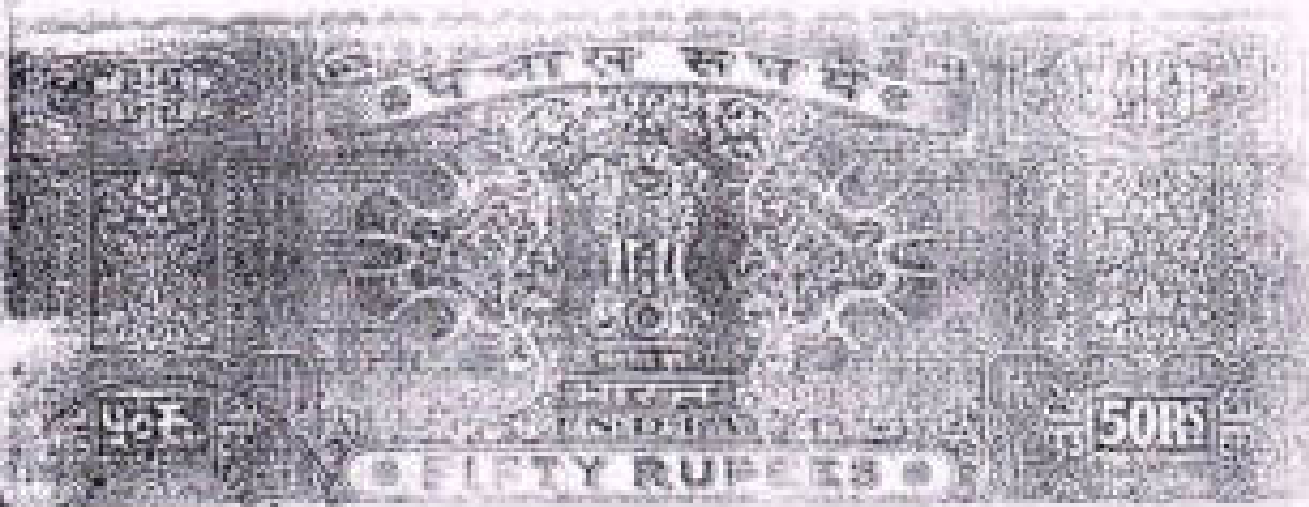
bioRxiv preprint doi: <https://doi.org/10.1101/000000>; this version posted November 1, 2014. The copyright holder for this preprint (which was not certified by peer review) is the author/funder, who has granted bioRxiv a license to display the preprint in perpetuity. It is made available under aCC-BY-NC-ND 4.0 International license.

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• CITY RUPES •

1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 26

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Sl. No.	Part	Description	Code	Value	Remarks
207	1	Surma Munda & Oth.	Chakrabarti	0.95	
207	2	Kalika Munda	do	0.51	
208	2	do	do	0.50	
209	38	A. J. A.	Code II	0.75	
210	11	Datta Munda	Chakrabarti	0.67	
211	12	do	Code II	0.96	
212	11	do	Chakrabarti	0.09	
213	12	Laxman Munda	Code II	0.73	
214	28	do	Chakrabarti	0.08	
215	37	Surma sadharan	Katta	0.31	
216	24	Mohan Munda	Chakrabarti	0.03	
217	24	do	Code II	0.47	
218	5	Gunda Apot	Code II	0.02	
219	30	A. J. A.	do	0.02	part
220	6	Gandu Apot	do	0.55	do
221	34	S. Munda & Oth.	do	0.23	do
222	11	Shree Mahakud & Oth.	do	0.64	do
223	17	Surma Katheran	Chakrabarti	0.12	
224	29	Laxman Munda	Code II	1.25	
225	39	A. J. A.	Part II	1.09	part
226	29	do	Part II	1.10	do
247	38	A. J. A.	Code II	1.10	
254	38	do	do	1.13	part
255	18	do	Chakrabarti	5.21	do
275	16	Surma & Oth.	Chakrabarti	1.40	do
276	36	do	Chakrabarti	0.50	do

TOTAL = 61.97 ACRES OR 25,847 MUDDOS.

[Signature]
A. Gopin.

[Signature]
MANORABHARU DAS
NO. 28305270041A



62

Keywords: child sexual abuse; disclosure; self-blame; social support



1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 26

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* 2000-2001
 * 2002-2003
 * 2004-2005
 * 2006-2007

1. 2000年12月1日

1. The first step in the process of identifying a problem is to determine the nature of the problem. This involves a thorough understanding of the situation and the people involved. It is important to gather as much information as possible and to consider all possible causes of the problem.

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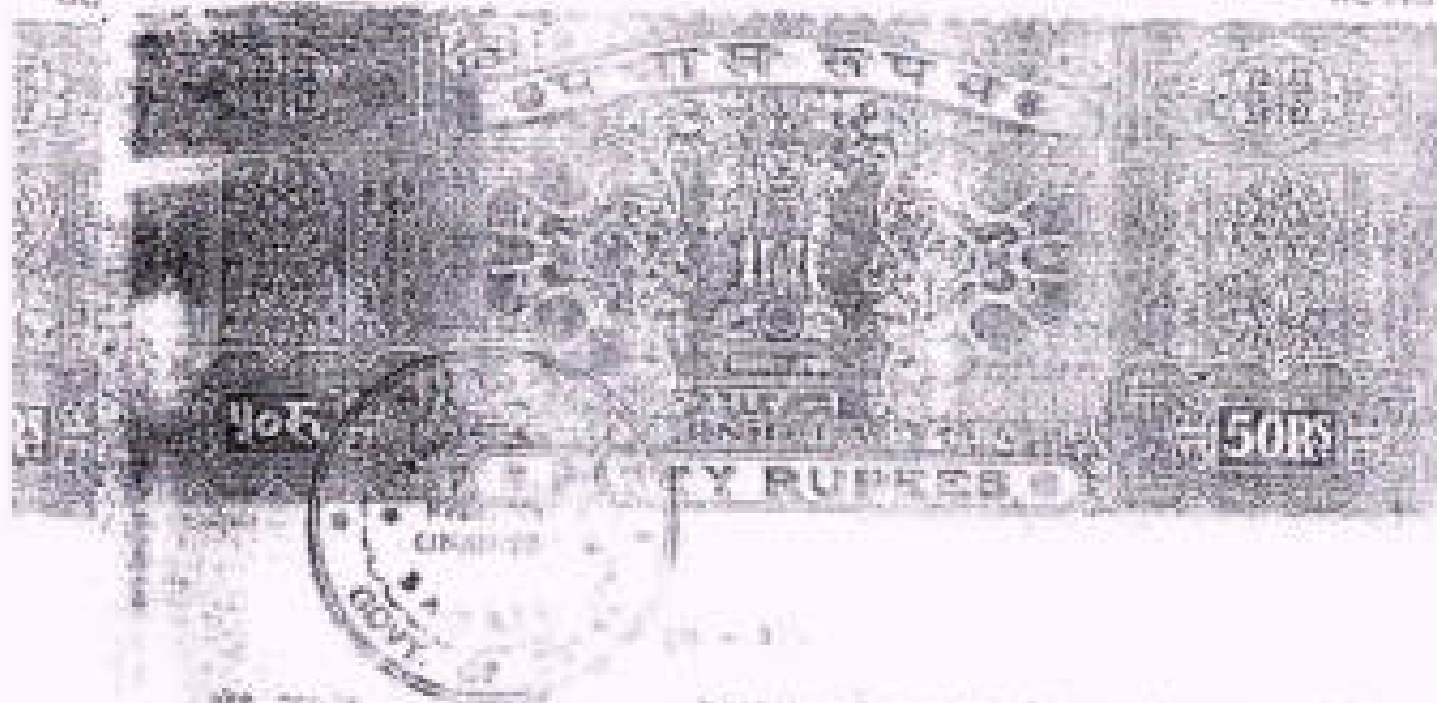
INVESTIGATIONS AND CONDITIONS IN 1941-42

11-11-2008



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the results
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existing
law and
the

Liberty and power for or in connection with any of the purposes mentioned in this part to make any townways, railways, roads, aircraft landing grounds and other ways in or over the said lands and to use motor-cars and to pass and repass with or without horses, carriages, wagons, aircrafts, locomotives or other vehicles over the same (or any existing townways, roads and other ways in or over the said lands) on such conditions as may be agreed to.

to get
building &
road material
to.

5. Liberty and power for or in connection with any of the purposes mentioned in this part to quarry the said stone, gravel and other building and road materials and clay or to use and employ the same and to manufacture out of clay (into bricks or tiles) and to use such bricks or tiles and to sell any such material or bricks or tiles.

to use water
from streams
or other
sources

Liberty and power for or in connection with any of the purposes mentioned in this part but subject to the clause of any existing or future law and with the written permission of District Collector/Collector to appropriate and use water from any streams, water-courses, springs or other sources in or upon the said lands and to divert, stop up or dam any such streams or water-courses and collect

Certified to be true copy
of the Original Document.

1952.11.19

Debarata Mishra

Notary Public

Regd. No. 112 of 1981

Place: ...

CHANDRABHANU DAS
RQP/BS/532004/A

S. A. Bhatnagar

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Department of Defense

SECRET

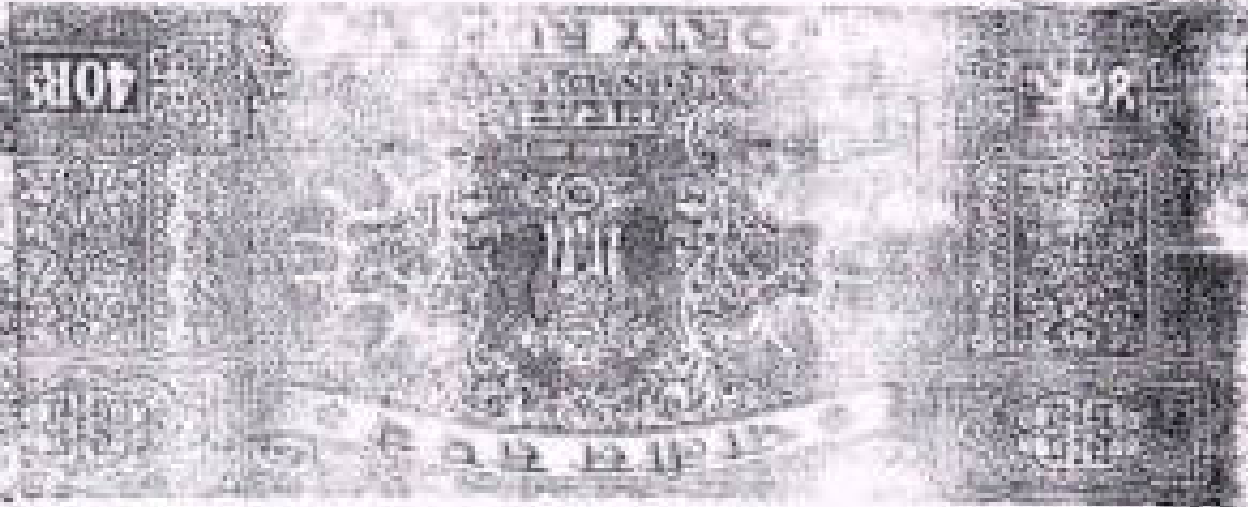
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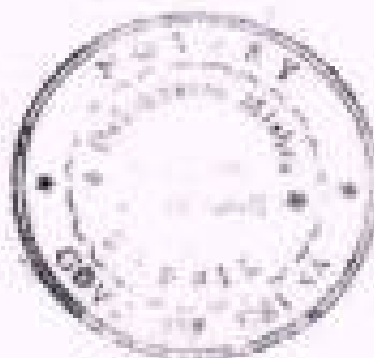
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CLASSIFICATION
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1999-2000 = 15

thereon. In Article 3 of Law 117 of this Schedule to clear undergrowth and to remove and to fell and utilize any trees or timber standing or found on the said lands provided that the State Government may ask the lessee to pay for any trees or timber felled and utilized, by him on the rates specified by the Deputy Commissioner/Collector or the State Government.

1000

RESTRICTIONS, AND CONTAINED AS TO THE NUMBER OF
 TO BE ISSUED, POWER AND PLACES IN EAST-

[illegible]

1. *Journal of the American Medical Association*
 2. *Journal of the American Medical Association*
 3. *Journal of the American Medical Association*
 4. *Journal of the American Medical Association*
 5. *Journal of the American Medical Association*

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Ministry of Mines
New Delhi

Deputy Minister

New Delhi

14.07.2001

Ministry of Mines

Page 17

1. The Government of India, Ministry of Mines, New Delhi, hereby directs that no person shall cut or remove any timber or trees without obtaining the permission in writing from the District Officer or other officer in accordance with such conditions as the State Government may prescribe.

2. The lessee shall not work or carry on or allow to be worked or carried on any mining operations at or to any point within a distance of 50 metres from any railway line except with the previous written permission of the Railway Administration concerned or under or beneath any roadway or any ropeway, trestle or station, except under and in accordance with the written permission of the authority owning the ropeway or from any reservoir, canal or other public works such as public roads & buildings or inhabited place except with the previous written permission of the Deputy Commissioner/Collector or any other Officer authorized by the State Government in this behalf and otherwise than in accordance with such instructions, regulations and conditions as may be attached to such permission. The said distance of 50 metres shall be measured from the case of a line, reservoir, or canal or from the edge of the bank of the river or of the railway as the case may be and in case of a building substantially from the plot boundary. In case of village roads no working shall be carried on within a distance of 10 metres of the outer edge of the cutting except with the previous permission of the Deputy Commissioner/Collector or any other officer duly authorized by the State Government in this behalf and otherwise than in accordance

B. A. Das

CHANDRASHANU DAS
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Director
of
the
Bureau
of
Prisons
and
Quarantine
Service
U. S. Department
of Justice

1. The Bureau of Prisons and Quarantine Service is hereby notified that the following information has been received from the Federal Bureau of Investigation (FBI) regarding the activities of the [redacted] group. The FBI has advised that the [redacted] group is currently active in the [redacted] area and is engaged in various activities, including the recruitment of new members and the collection of funds. The FBI has also advised that the [redacted] group is planning to hold a meeting in the [redacted] area on [redacted] date. The Bureau of Prisons and Quarantine Service is requested to take appropriate action to prevent the [redacted] group from carrying out its activities and to identify and apprehend its members. The Bureau of Prisons and Quarantine Service is also requested to keep the FBI advised of any information received regarding the activities of the [redacted] group.

Very truly yours,
Director
Bureau of Prisons and Quarantine Service
U. S. Department of Justice
10/15





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Deputy Minister
New Delhi
Ref: No. DM-07/2001
Mr. Kanchan (Orissa)

Page- 15

PART- IV
LIBERTY, POWERS AND RIGHTS
RESERVING TO THE STATE GOVERNMENT

Liberty and power for the State Government, or to any lessee or person authorized by it in that behalf to enter into and upon the said lands and in search for, win, work, dig, get, raise, dress, process, convert and carry away minerals other than the said minerals and any other substances and for these purposes to sink, drive, make, erect, construct, maintain and use such pits, shafts, inclines, drifts, levels and other lines, waterways, airways, water courses, drains, reservoirs, engines, machinery, works, buildings, canals, tramways, railways, roads and other works and conveniences as may be deemed necessary or convenient.

PROVIDED THAT in the exercise of such liberty and power no substantial hindrance or interference shall be caused to or with the cultivation, powers and privileges of the lessee under these provisions and the State shall compensate (as may be mutually agreed upon) in the event of displacement as may be required to the State Government shall be made by the lessee for all loss or damage sustained by the lessee by reason or in consequence of the exercise of such liberty and power.

Encl... p/27


B. A. Das


CHANDRABHANU DAS

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Deputy Minister
Mining Section

Regd. No. ON-07/2001
Date: 12/12/2001

Page- 31

Part- V

PROVISIONS RESERVED BY THIS LEASE

1. The lessee shall pay, for every year commencing from the first year of the lease, dead rent as specified in clause 2 of this part :

Provided that, where the holder of such lease becomes liable under section 3 of the Act, to pay royalty for any mineral removed or obtained by him or by his agent, manager, employee, contractor or sub-lessee from the leased area, he shall be liable to pay either such royalty or the dead rent in respect of that area, whichever is higher.

2. Subject to the provisions of clause 1 of this part, during the subsistence of the lease, the lessee shall pay to the State Government annual dead rent for the lands devised and described in Part II of this Schedule at the rate of the time being specified in the Third Schedule to the Act, in the manner as may be specified in this behalf by the State Government.

3. Subject to the provisions of clause 1 of this part, the lessee shall during the subsistence of this lease pay to the State Government at such times and in such manner as the State Government may prescribe in respect of any mineral/minerals removed by him from the leased area at the rate for the time

12/12/2001

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B. A. Bhatnagar

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ABRAHAMUDAS
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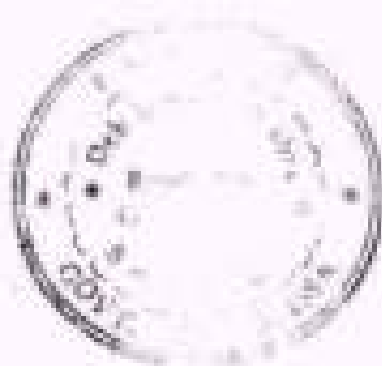
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Fig. 2. *Phragmites* distribution in the study area.

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Dr. B. R. Mitra
Secretary
Ministry of Mines
New Delhi (India)

Page 2 of 2

of the ... the account of the deposit made by
him as licensee over an area which includes the
said ... will be retained and controlled by the
State Government in satisfaction of the costs and
royalties provided in Part V and ... that ...

3. For the purpose of computing the said
royalties the licensee shall keep a correct account of
the mineral produced and despatched. The quantity as
well as the weight of the mineral in stock or in the
process of export may be checked by an officer
authorised by the Central or State Government.

4. Here specify the mode of arriving at
sale price prices at pits mouth of mineral/minerals).

(a) Notwithstanding any proof that may
be produced by the licensee of sale at pits mouth of
the ore at any lower price, for the purpose of cal-
culating royalty, the sale price at the pit's
mouth shall be calculated back from the price of the
ore of ... for the ore in the Country.
The State Government shall decide from time to time
the ... Bulletin or Government ...
Bulletin ... the prevailing price shall be
ascertained for the ... for the general.
The State Government shall also decide from time
to time ... fair price of the mineral
at the ... of markets recognised by the State

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A. A. Hallam

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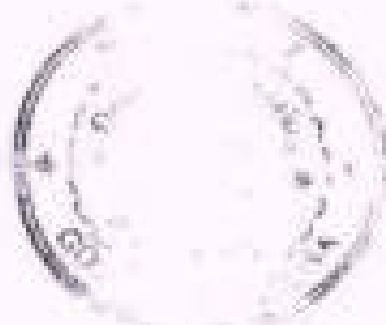
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New Delhi
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Gen. Kanwar (Chand)

Page- 11

... for computation of the said
... addition, if such analysis report
... of one percent or more in
the ... high grade ore, or two percent or
more in ... of the grade ore, the cost of such
analysis to be lesser shall also be reimbursable
from ...

... should any rent, royalty or other sum
due on the lease Government under the terms and
conditions ... be presented be not paid by the Lessee
within the prescribed time, the same, together with
simple interest due thereon at the rate of twenty
four percent per annum may be recovered on a certi-
ficate of the officer as may be specified by the
State Government by general or special order, in the
same manner as in regard of land revenues.

PART- VII

THE OBLIGATIONS OF THE LESSOR/LESSEE

1. The lessee shall pay for rents, water
rate ... as provided by this lease at each
time ... as provided in ... and VI
of these ... and shall also pay for discharges
all ... and ... and ...
over ... of public demands which shall
from ... be charged, assessed or imposed by
the ... of the Central and State Governments
upon ... of the premises ... of the
lessee ... other provisions and works of
a like ... except ... for land revenues.

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B. A. Rollin.

CHANDRASHANUDAS
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The first of these is the fact that the Navy is not a single entity, but a collection of many different organizations, each with its own interests and priorities. This makes it difficult to coordinate efforts across the entire organization, and it is often necessary to negotiate with various departments in order to achieve common goals.

The second of these is the fact that the Navy is a very large organization, with a wide range of responsibilities and a large number of personnel. This makes it difficult to manage and coordinate efforts across the entire organization, and it is often necessary to delegate responsibilities to various departments in order to achieve common goals.

The third of these is the fact that the Navy is a very complex organization, with a wide range of responsibilities and a large number of personnel. This makes it difficult to manage and coordinate efforts across the entire organization, and it is often necessary to delegate responsibilities to various departments in order to achieve common goals.

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Deputy Minister
Ministry of Mines
New Delhi-110002
Gen. Manager (Office)

21/08-27

2. The lessee shall be responsible for the support of any
workings, shaft or adit and all costs and
expenses incurred therein.

The lessee shall during the subsistence
of the lease well and sufficiently serve and keep
open the shaft or other suitable means all pits,
shafts and workings that may be used or used in the
said lease and work and maintain sufficient timber
to the satisfaction of the State Government round
every such pit, shaft or working whether the same
is worked or not and shall during the same period
keep all workings in the said lands except such as
may be closed, drained, accessible free from water and foul
air as far as possible.

The lessee shall strengthen and support
to the satisfaction of the Railway Administration
and the State Government, as the case may be,
any part of the mine which in its opinion requires
such strengthening or support for the safety of any
railway, viaduct, canal, road and any other public
works or structures.

The lessee shall allow any officer author-
ized by the Central Government or the State Govern-
ment to enter upon the premises
for the purpose of inspecting, examin-
ing, testing, prospecting and taking plans thereof
and for the purpose of collecting any data and the lessee
shall not employ any person employed by the lessee and

contd... 6/78

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CHANDRAMANU DAS
RCP/BBB/052/2004/A

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B. J. Hall

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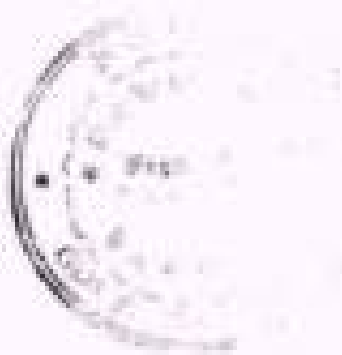
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Deputy Minister
Ministry of Mines
New Delhi
Date: 14/01/2001
The Minister (Mines)

Page 29

keep
records and
accounts
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of
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1. The records of production of minerals shall be maintained in the form of books, registers, accounts, etc., and shall be submitted to the concerned authorities for verification.

2. The records of production of minerals shall be maintained in the form of books, registers, accounts, etc., and shall be submitted to the concerned authorities for verification.

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Encl. 1/1/01

B. A. Haldar

J. K. Das
Minister (Mines)
Ministry of Mines
New Delhi
Date: 14/01/2001
The Minister (Mines)

1. *Journal of Management Education*
 2. *Journal of Management Inquiry*
 3. *Journal of Management Research*
 4. *Journal of Management Studies*
 5. *Journal of Management Teaching*
 6. *Journal of Management Education*
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 9. *Journal of Management Studies*
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1. *Journal of the American Medical Association*, 2000; 283: 2686-2692.
 2. *Journal of the American Medical Association*, 2000; 283: 2693-2698.



Document to be filed in the
File Original documents

Deputy Minister
Forest Deptt.
No. 100/1991
Date: 10/10/91

1. The Government of India, Ministry of Environment and Forests, authorized its Chief Secretary, Government of India, to conduct an inquiry into the area of the forest land, as shall also comply with the provisions of the Forest Act, 1927 and the Forest Rules, 1928. The Chief Secretary, Government of India, shall also comply with the provisions of the Forest Act, 1927 and the Forest Rules, 1928, and shall also comply with the provisions of the Forest Act, 1927 and the Forest Rules, 1928, and shall also comply with the provisions of the Forest Act, 1927 and the Forest Rules, 1928.

2. The lessee shall pay a wage not less than the minimum wage prescribed by the Central or State Government from time to time.

3. The lessee shall comply with provisions of the Forest Act, 1927 and the rules made thereunder.

4. The lessee shall take measures for the protection and improvement like planting of trees, reforestation or afforestation, use of pollution control devices and adopt other measures as may be prescribed by the Central or State Government, from time to time, at his own expense.

5. The lessee shall pay compensation to the owner of the land on the date and in the manner as may be prescribed.

6. The lessee shall, in the event of any dispute, refer the matter to the arbitrator appointed by the Government and to the provisions of the Forest Act, 1927 and the Forest Rules, 1928.

10/10/91
Chief Secretary
Forest Deptt.

A. Holm

CHANDRABHANU DAS
RQ/BB/552/2004/1

1. *Journal of the American Medical Association*, 1997; 278: 1039-1044.
 2. *Journal of the American Medical Association*, 1997; 278: 1045-1050.
 3. *Journal of the American Medical Association*, 1997; 278: 1051-1056.

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The Board of Directors
 of the Corporation
 do hereby certify that
 the foregoing is a true and
 correct copy of the
 original records of the
 Corporation.
 Secretary



A handwritten signature in dark ink, appearing to read "J. J. ...". The signature is written in a cursive style and is located at the bottom left of the page.

Allegory, Market

DOI: 10.1002/for

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CHANDRABHANU DAS
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Copy to be kept by
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Business Office
Ministry of
P. & W. Development
New Delhi (India)

Whereas the Government of India has provided
that the Government shall have the right to
acquire any land or interest in land which is required
by the Government for the purpose of the land
program by the Government or holders of agricultural
land

And whereas the Government shall, without the
previous consent in writing of the State Government
and in the case of mining lease in respect of any
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the Government shall, mortgage or in any other
manner, transfer, lease or any right, title
or interest in the land

And whereas the Government may, in any agreement contract
or otherwise, whereby the lessee will or may be
directly or indirectly financed to a substantial
extent, if the Government shall the lessee's operations
or activities will or may be substantially con-
trolled by or person or body of persons other than
the lessee

Provided that the State Government shall not
give any such contract unless

The Government has furnished an affidavit
along with the application for transfer of the mining
lease stating the reasons for such transfer and
the Government has agreed to take the necessary
steps for the transfer

CHANDREBHANU CAS

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1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific information required.

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which shall be made with the least possible delay and a reasonable opportunity

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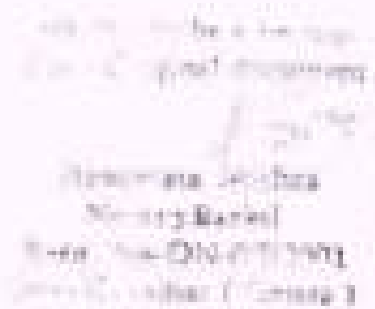
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Wang et al. (2009)



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L. Palmer



Chief Secretary
to the Government
Ministry of Agriculture
New Delhi 110 001
Date: 24.07.2001
Page: 41

1. The State Government original or certified copies of contracts and charter parties entered in or the sale or freightage of any cargo or goods.

2. In the event of the occurrence of a State of emergency (of which the President of India shall be the sole judge and a declaration to that effect in the Gazette of India shall be conclusive proof), the State Government shall have the right of the Central Government shall have the right to take over and all times during the said term have the right to be exercised by a notice in writing to the lessee) (forthwith take possession and control of the whole, plant, machinery and premises of the lessee) in connection with the said lands or buildings under this lease and during such possession or control the lessee shall conform to and obey all directions given by or on behalf of the Central Government or State Government regarding the use or employment of such works, plants, premises and minerals. PROVIDED that fair compensation which shall be determined in accordance of agreement by the State Government shall be paid to the lessee for all loss or damage sustained by him by reason or in consequence of the exercise of such powers shall not detract from the said lease hereby granted or affect the terms and conditions of the lease or any proceeds further that may be necessary to give effect to the provisions of this lease.

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S.A. Balim


CHANDRABHANU DAS
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[Signature]

Dr. J. H. W. Smith

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When we usually map, sections, plans, and cross-sections are drawn and other surveys are made. Logging collected by him during the course of mining operations to the Director General, Geological Survey of India, Calcutta and to the Director of Mining, Dibrugarh.

Applied to
Sustaining

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The decision of the State Government as to when
to carry out or performance of its work and
the amount on demand all expenses which shall be incurred
in performing and the lessee shall pay for those com-
pleted within the time specified in this contract. The
State Government may cause the same work to be done

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Deputy Minister
Ministry of Mines
New Delhi, India

Data or information referred to above shall be furnished every year reckoned from the date of commencement of the mining lease.

PART- VIII

THE COVENANTS OF THE STATE GOVERNMENT.

1. The lessee paying the rents, rates and royalties hereby reserved and observing and performing all the covenants and agreements hereinafter contained and on the part of the lessee to be observed and performed shall and may quietly hold and enjoy the rights and premises hereby devised for and during the term hereby granted without any unlawful interruption from or by the State Government, or any person rightfully claiming under it.

2. If in accordance with the provisions of clause 4 of Part VII of this Schedule the lessee shall offer to pay to an occupier of the surface of any part of the said lands compensation for any damage or injury which may arise from the proposed operations of the lessee and the said occupier shall refuse his consent to the exercise of the rights and powers reserved to the State Government and devolved to the lessee by these presents and the lessee shall report the matter to the State Government and shall deposit with it the amount offered as compensation and if the Central/State Government is satisfied that the amount of compensation offered is fair and reasonable or if it is not so satisfied and the lessee shall have deposited with it such further

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[Signature]
A. B. Bhatnagar

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CHANDRASEKHAR
RODENT

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March 1945

agreement was performed up to the date of the
 agreement and on the date of the agreement
 and during the several agreements in 1945
 and 1946 the parties hereto agreed that the
 parties hereto in writing and shall not be
 in the State Government (1945-1946)
 order to the effect of the last mentioned
 even hereby intended and is otherwise intended
 of them for a further term from the expiration of
 term of the parties hereto and in any case
 If the parties be desirous of making a renewal
 Government.

be subject to the prior approval of the
 and in the event of the renewal will
 If the parties be in respect of the parties hereto

applied for
 reference to be recorded in writing and shall not be
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otherwise.
 of the provisions of the act for the parties hereto
 If the parties be in respect of the parties hereto

of the parties hereto shall be guided by the parties hereto
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March 1945
 State Government
 State Government





checked by me & the file of the Original document

Secretary, Mines
 Ministry, Madras
 R-14, 14-04-07/1301
 One-Kanjar (Ore)

Page- 45

term hereby granted. The State Government on receipt of application for renewal, shall consider it in accordance with the provisions of the Act and the Rules made thereunder and shall pass orders as it deems fit. If renewal is granted, the State Government will at the expenses of the lessee and upon his executing and delivering to the State Government if required a counter part thereof executed and deliver to the lessee a renewed lease of the said premises or part thereof for the further term of 25 years at such rents, rates and royalties and on such terms and subject to covenants and agreements including this present covenant to renew as shall be in accordance with the Mineral Concession Rules, 1930, applicable to Para. 6, Bangalore Act, on the day next following the expiration of the term hereby granted.

2. The lessee may at any time terminate this lease by giving not less than 12 calendar months notice in writing to the State Government or to such officer or authority as the State Government may specify in this behalf and upon the expiration of such notice provided that the lessee shall upon such termination render and pay all rents, rates, royalties compensation for damage and other moneys which may then be due and payable under these presents to the lessor or any other person or persons and shall deliver these presents to the State Government

cc-1 to 1/15

B. A. Ballar

CHANDRASHANU DAS
 RGPBBS/052/2004A

2. Clearly to
 determine
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E. A. Tamm
[Signature]

could
 after investigation was not required to be
 this leave was not calculated in deposit
 amount of the deposit paid in advance of
 payment of the deposit and of any revenue
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 made in advance of the deposit
 as authorized of any other person who is
 cause and is liable in the making of the deposit
 (b) There is no obligation that he will not
 date of the deposit and
 he is not to be liable for any deposit
 (c) There is no obligation for such deposit

the leave
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 the or more otherwise from his leave which is the
 action made by the committee from him to the
 (d) The state government may be an action
 defined in these provisions.

provision of any of the provisions of the committee
 and right of the committee of the leave in regard to any
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 then this leave and the said term and limitations

Page - 12



One to the U.S. District Court
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 at the District Court

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and the original documents

Deputy Minister
Sri. Barbed
Regd. No. 14/07/1901
Chandrabhanu (Cms)

any of the purposes mentioned in this lease shall
be refunded to the lessee. No interest shall run
on the security deposit.

PART- IX

GENERAL PROVISIONS

1. In case the lessee or his assignee/assignee does not allow entry or inspection by the officer authorised by the Central or State Government under clauses (i), (ii) or (iii) of sub-rule (1) of rule 17 of said rules, the State Government shall give notice in writing to the lessee requiring him to show cause within such time as may be specified in the notice why the lease should not be determined and his security deposit forfeited, and if the lessee fails to show cause within the aforesaid time to the satisfaction of the State Government, the State Government may determine the lease and forfeit the whole or part of the security deposit.

2. If the lessee or his assignee or assignee makes any default in payment of rent or water rate or royalty as required by section 9 of the Act or commits a breach of any of the conditions and covenants other than those referred to in clause (i) above, the State Government shall give notice to the lessee requiring him to pay the rent, water rate, royalty or to remedy the breach, as the case may be, within sixty days from the date of receipt of the notice and if the lessee fails to pay the rent and royalty or to remedy the breach within the specified time, the State Government may determine the lease and forfeit the whole or part of the security deposit.

CHANDRABHANU DAS

S. M. Bhanu

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Page- 11

5. The lessee having first paid the discharged rate, taxes and royalties payable by virtue of these payments may at the expiration or sooner determination of the said term or within six calendar months thereafter (unless the time shall be determined under clauses 1 and 2 of this part and in that case at any time not less than three calendar months nor more than six calendar months after such determination) take away and remove for his own benefit all or any engines, machinery, plant, buildings, structures, railways, railways and other works erections and erections which may have been erected, set up or placed by the lessee in or upon the said land and upon the lease he is bound to deliver to the Government within clause 20 of Part VII of the schedule and which the State Government may not desire to purchase.

6. If at the end of six calendar months after the expiration or sooner determination of the said term or the provision contained in clause 4 of Part VII of this Schedule becomes applicable there shall remain in or upon the engines, machinery, plant, buildings, structures, railways and other work, erections and erections which are not taken away by him under provisions of this lease.

contd.

[Signature]

B. A. Hollis

CHANDRASHANU DAS
R01BBS/052/2004/A



powers and privileges conferred upon him by these provisions.

9. For the purpose of stamp duty to be paid on the memorandum and articles of association, the company shall be deemed to be a company limited by shares.

IN WITNESS WHEREOF the undersigned, the Secretary of the company, has hereunto set his hand and seal this 14th day of July 2004.

Sd/-

[Signature]
Secretary

To be signed by the
Governor/President of India
In the presence of:-

1. *[Signature]* Secretary
2. *[Signature]* Joint Secretary

In the presence of individual and individual company membership firm.

To be signed by the
Registrar of Companies

[Signature]
Registrar of Companies
Bangalore
14/07/2004
Sd/- (D)

1. *[Signature]*
S/o *[Name]*
At *[Place]*

In the presence of

2. *[Signature]*
the
attorney
(s)
of

the
company
in the

[Signature]
S/o *[Name]*

[Signature]
Typical

[Signature]
CHANDRABHANU DAS
RQP/BS/052/2004/A

3.3.3 Ambient Air Quality:

To ascertain the impact of the proposed project on the ambient air quality, it is necessary to evaluate the existing ambient air quality. The existing ambient air quality in terms of Suspended Particulate Matter (SPM), Sulphur Dioxide (SO_2) and Oxides of Nitrogen (NO_x) has been measured through a planned field monitoring. AAQ monitoring work was carried out at different locations in the core area and in the 10km radius of the study area.

Sampling was done in all the above sampling locations and the same was carried out at 3 meter above the ground on a platform erected with sunrope at the base. The station represents approximately the highest ground level of the area and practically having no obstruction. There is no stack in the area. The result obtained was compared with standards recommended for ambient air quality. The comparison reveals that the ambient air quality meets results are well within the stipulated limits. The summarized AAQ monitoring result is given in Table-3.20. The details are being presented in Annex-4.

Table: 3.20- Summarized Ambient Air Quality Monitoring Results

Table: 3.20- Summarized Ambient Air Quality Monitoring Results													
Location	PM10 ($\mu\text{g}/\text{m}^3$)				SO ₂ ($\mu\text{g}/\text{m}^3$)				NO ₂ ($\mu\text{g}/\text{m}^3$)				Std. limit
	Min	Max	Avg	95 %ile	Min	Max	Avg	95 %ile	Min	Max	Avg		
Tahara	50	95	38.2	94.7	5.5	11.1	6.71	11.1	0.2	12.4	10.81	15.4	
Chandani	49	95	35.2	91.7	5.6	11.5	6.87	11.1	0.1	12.8	11.02	15.4	
Adaghat													
Off. area	60	96	37.3	96.6	5.9	10.6	8.36	10.8	0.3	15.3	11.17	15.4	
Kandrupani	68	96	83.9	95	6.5	9.8	11.5	8.74	10.6	16.6	12.03	14.2	
Banada	54	92	76.1	93.3	4.8	10.5	7.33	10.2	0.6	12.7	10.95	15.4	
Nagpur	55	64	71.2	87.4	5.8	10.7	7.66	10.3	0.3	13	11.29	12	
Singhpada	56	92	73.6	89.9	5.1	9.5	7.20	9.30	0.6	14	11.49	15.4	
Chandaband													
Id	41	90	65.6	80.1	6.2	9.7	7.88	9.27	10.2	15.3	12.01	15.4	

3.6.2 Dust Fall:

Dust fall data at six locations are presented in the Table-3.21.

Table-3.21: Dust Fall Rate

Station No.	Sampling Station	Dust fall (Ton/Sq. Km/Month)
S1	Adaghat	4.2
S2	Hirada	3.8
S3	Khandabwaha	4.3
S4	Kineshi	2.8
S5	Kundrupa	3.3

(Source : Based on Field Monitoring Results between Dec'07 to Feb.'08)

3.6.3 Noise Level:

Evaluation of present status of noise level in the core zone & 10 km radius around the project area was done on weekly basis. The noise level monitoring was carried out on 07 days. The report was presented as minimum, maximum and average value in Table-3.22 and the graph of the variation of the noise level is being given in Fig 3.10.

Table-3.22: Noise Level Monitoring Data of the Study Region (in dB(A) Leq)

Stn. No.	Location	dB(A) Leq					
		Day (06.00 A.M.-10.00 P.M.)			Night (10.00 P.M.-06.00 P.M.)		
		Max.	Min.	Avg.	Max.	Min.	Avg.
N1	Adaghat	69	38	33.8	42	33	38.2
N2	Hirada	45	22	38.0	40	30	35.6
N3	Kundrupa	47	36	39.8	38	30	35
N4	Kineshi	46	35	40.2	39	31	36

(Source : Based on Field Monitoring Results between 0 Dec'07 to Feb.'08)

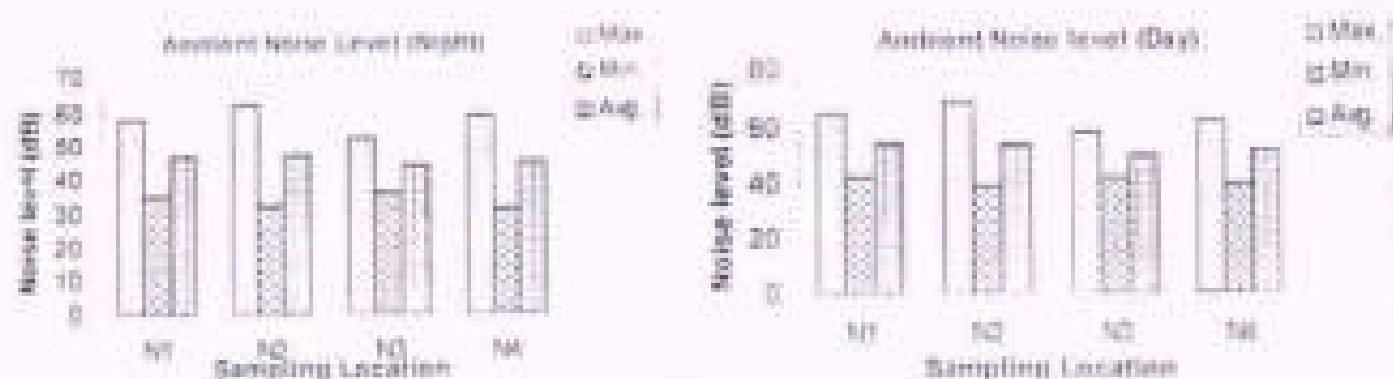


Fig – 3.16: Ambient Noise level (Day & Night)

3.6.4 Water Quality

Water samples around different locations in the core zone and 10 km radius around the study area were collected. There are 12 sampling stations selected, including 6 stations for surface and 6 stations for ground water in the core zones and 10 km radius around the study area, from which samples were collected to represent the water quality of the area. All the surface water and ground water samples collected were analyzed as per IS 3296 and IS 10500. The result of surface water samples is presented in Table-3.23 and that for ground water is presented in Table-3.24. It has been observed that the parameters were within the prescribed limits. The method of analysis, instruments used and the minimum detection limit for the water quality parameter analysis is given in Table – 3.4

Table-3.23 Results of Surface water analysis

Parameters	Unit	Result					
		SW1	SW2	SW3	SW4	SW5	SW6
pH		6.8	7.1	7.1	6.9	7.2	6.8
Colour	Hazen	Clear	Clear	Clear	Clear	Clear	Clear
Taste	--	Tasteless	Tasteless	Tasteless	Tasteless	Tasteless	Tasteless
Odour	--	U/D	U/D	U/D	U/D	U/D	U/D
Conductivity	$\mu\text{mho/cm}$	152	142	138	143	130	125

A.47

A.47 (continued) (continued) (continued)

Temperature (in °C)	°C	16	20	18	20	18	16
Dissolved solids	mg/l	158	122	138	151	136	145
Suspended solids	mg/l	38	25	28	41	36	42
Total Hardness as CaCO ₃	mg/l	58	60	65	71	68	72
Sulphate as SO ₄	mg/l	12	5	8	10	9	7
Chloride as Cl	mg/l	10	18	15	12	10	8
Fluoride as F	mg/l	ND	ND	ND	ND	ND	ND
Dissolved Oxygen	mg/l	1.2	0.8	0.2	1.3	0.5	1.1
BOD (5 days at 27°C)	mg/l	1.5	1.2	1.6	1.8	2.1	1.7
COD	mg/l	4.2	3.8	5.1	3.58	4.3	3.8
Oil & Grease	mg/l	ND	ND	ND	ND	ND	ND
Cyanide as CN	mg/l	ND	ND	ND	ND	ND	ND
Hexavalent chromium	mg/l	ND	ND	ND	ND	ND	ND
Mn	mg/l	2.26	2.35	3.52	2.68	1.25	0.82
Fe	mg/l	0.136	0.053	0.154	0.114	0.179	0.119
Phosphate	mg/l	0.142	0.21	0.32	0.25	0.18	ND
Vanadium	mg/l	ND	ND	ND	ND	ND	ND
Nitrite nitrogen	mg/l	0.063	0.042	0.055	0.048	0.062	0.025
Zinc	mg/l	0.32	0.25	0.36	0.42	0.21	0.18
Cu	mg/l	ND	ND	ND	ND	ND	ND
Pb	mg/l	ND	ND	ND	ND	ND	ND
Nickel	mg/l	ND	ND	ND	ND	ND	ND
Bio-assay Test	—	96% survival	96% survival	96% survival	96% survival	96% survival	96% survival

Total coliforms	MPN/100 ml	33	18	25	55	22	10
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(Source : Based on Field Monitoring Results between Dec'07 to Feb.'08)

Interpretation Surface water quality results

- **Conductivity** : The conductivity level in the six monitoring stations ranges from 125- 152 μ mho/cm. This indicates the presence of suitable amount of ionic substance in the water which is suitable for irrigation.
- **pH** : The pH level of the monitoring station ranges from 6.8 to 7.3 . This indicates that the pH of the surface water in the study area is all most neutral in nature.
- **DO** : The dissolved oxygen concentration of the surface water samples of the study area ranges from 5.2 to 7.2 ppm. This indicates that the water is not heavily contaminated with organic pollutants.
- **BOD** : The BOD value of the water samples in the study area ranges from 1.2 to 2.1 mg/l .
- **Heavy Metals** : Heavy metals like Cu, Pb, Ni, Vd are absent in the study samples. Further traces of Hexavalent chromium, CN, F, Oil and Grease are also not present.
- From the water quality results it can be inferred that all the parameters analyzed are under the normal limit and the water does not contain any pollutants which would be hazardous for human, animal or crop health.

Table-3.24 Results of ground water analysis

Parameter	Unit	Standard for Ground water (IS : 10500)	GW1	GW2	GW3	GW4	GW5	GW6
E^{25}	—	15.0-25.0	6.8	7.1	7.1	6.9	7.2	7.0
Colour	Hazen	Colorless	Colorless	Colorless	Colorless	Colorless	Colorless	Colorless
Odour	—	Odourless	Odourless	Odourless	Odourless	Odourless	Odourless	Odourless
Taste	—	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
Turbidity	N.T.U	5.0	3.2	1.9	2.2	3.1	1.8	4.3
TDS	mg/l	500	232	163	148	218	125	222


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Total Hardness as CaCO_3	mg/l	300	124	122	75	123	154	98
Chloride as Cl^-	mg/l	250	15	18	20	14	42	18
Sulphate as SO_4	mg/l	200	12	13	21	28	23	34
Free residual Chlorine	mg/l	0.2		BDL	BDL	BDL	BDL	BDL
Iron as Fe	mg/l	0.1	0.022	0.015	0.032	0.018	0.022	0.035
Fluoride as F^-	mg/l	1.0	ND	ND	ND	ND	ND	ND
Calcium as Ca	mg/l	75.0	42	52	28	25	18	36
Manganese (Mn)	mg/l	0.1	0.01	ND	ND	ND	ND	ND
Mineral oil	mg/l	0.01	BDL	BDL	BDL	BDL	BDL	BDL
Cadmium as Cd	mg/l	0.003	ND	ND	ND	ND	ND	ND
Zinc as Zn	mg/l	5.0	0.03	ND	ND	ND	ND	ND
Selenium as Se	mg/l	0.01	ND	ND	ND	ND	ND	ND
Nitrate as NO_3	mg/l	45	0.52	0.21	0.65	0.56	0.48	0.32
Phenolic compound as $\text{C}_6\text{H}_5\text{OH}$	mg/l	0.001	ND	ND	ND	ND	ND	ND
Aluminium as	mg/l	0.01	ND	ND	ND	ND	ND	ND
Arsenic as As	mg/l	0.01	ND	ND	ND	ND	ND	ND
Boron as B	mg/l	1.0	ND	ND	ND	ND	ND	ND

(Source : Based on Field Monitoring Results between Dec'97 to Feb.'08)

3.6.5 Soil Characteristics:

The soil, which covers the greater part of the district, is apparently derived from the underlying & igneous metamorphic rocks and the difference in it is mainly due to classification and

transformation affected by the surface drainage. Generally, the soil of the district comprises of two types. Red soil occupying most part of the district followed by the red laterite soil.

Soil samples were collected from six different sampling locations (Fig. 3.15) in the season and were analyzed for the soil structure, texture, moisture, content, nutrient level and other chemical parameters.

The thickness of the topsoil zone in the areas of proposed activity is very thin. The soil is mostly yellow and red in colour and lateritic in nature. The area consists of Mahurum and lateritic Mahurum. The area covers major part of the hill slope and plane area. The analysis results of the samples are indicated in Table-3.25

Table-3.25: Soil Sample Analysis Result						
PARAMETER	Soil 1	Soil 2	Soil 3	Soil 4	Soil 5	Soil 6
Chemical Analysis						
pH	6.8	7.2	6.5	7.1	7.0	6.9
Electrical Conductivity in $\mu\text{hos/cm}$	268	232	280	320	368	323
Available Magnesium %	0.022	0.012	0.035	0.028	0.021	0.016
Nitrogen %	0.015	0.011	0.036	0.039	0.042	0.036
Phosphorous %	0.018	0.013	0.022	0.029	0.017	0.031
Potassium %	0.012	0.011	0.009	0.043	0.021	0.013
Natural Moisture Content %	2.6	2.3	1.8	2.1	2.5	1.9
GRAIN SIZE ANALYSIS						
Gravel %	5.8	7.7	8.1	7.9	8.2	12.5
Sand %	53.6	30.2	48	58.6	57.2	30.5
Silt & Clay %	62.5	52.6	42.6	48.5	51.2	58.0
Textural Class	Silty sand	Sandy silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt
Bulk Density Gm/cc	1.36	1.45	1.28	1.36	1.36	1.25
Infiltration Rate cm/hr	0.32	0.48	0.69	0.43	0.53	0.49
Field Capacity %	41	36	55	71	37	41
Wilting Coefficient %	5.8	6.2	4.8	6.3	7.5	6.3
Available Water Storage Capacity	45	52	41	35	30	38
(Source : Based on Field Monitoring Results between Dec'02 to Feb'08)						

FEASIBILITY STUDY REPORT

OF

ORAGHAT IRON & MANGANESE ORE MINE

ML AREA OVER 25.847 HECT OR 63.87ACRES FOR IRON AND MANGANESE IN VILLAGE ORAGHAT UNDER KOIRA P. S. OF SUNDARGARH DISTRICT, ODISHA.

(FOR THE PERIOD OF 2013 – 14 TO 2017-18)

Status of Lease Area

Category	Forest land	Non-Forest Land	Date of lease execution	Date of lease Expiry
A-OIFM	5.888 Ha.	19.959 Ha.	06.04.1998	05.04.2018

Lessee

Sayed Abdul Halim

Prepared by

Chandrabhanu Das
RQP/ BBS/052/2004/A

GEO CONSULTANTS PVT. LTD.
BHUBANESWAR


CHANDRABHANU DAS
RQP/BBS/052/2004/A

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CHAPTER – I

INTRODUCTION

Lessee Sayed Abdul Halim had applied for the mining lease over an area of 64.77 acres or 26.216 ha for the above said area. However, mining lease was granted over a reduced area of 25.847 Ha. or 63.87 acres.

The iron and manganese ore mining lease over an area of 25.847 ha. or 63.87 acres in village Oraghat in Bonai Sub-Division of Sundergarh district of Odisha was executed in favour of the lessee, Sayed Abdul Halim by Government of Odisha on dt.04.06.1998 for a period of twenty years.

The total M.L. area of 25.847 ha. Comprises of PRF/DLC forest 5.888 ha. and 19.959 ha. of non forest. The lessee has applied for diversion of 5.888 ha. of PRF/DLC forest land including 0.562 ha. PRF/DLC forest land has coming within safety zone which is under process.

Mining Plan was prepared and approved by the Regional Controller of Mines, Indian Bureau of Mines, Calcutta vide letter no. CAL/SG/Fe & Mn/MP-515 dated 18.09.1997, over the area of 26.216 Ha before the grant of the lease. As the mining plan was approved over an area of 26.216 Ha. the lessee had submitted the modification to the approved mining plan under Rule 10 of M.C.D.R. 1988 for the revised executed area of 25.847 ha or 63.87 acres and was approved vide letter no-MP/OTF/MECH/21-OR/BHU/2008-09 dt. 18.12.2008. Then the scheme of mining was prepared for the year 2008-09 to 2012-13 under rule 12 of MCDR 1988. The said scheme of mining was approved by IBM Bhubaneswar vide letter no-MS/OTFMECH/26-OR/BHU/2008-09 dt.29.12.2008. The task force of Indian Bureau of Mines inspected the

mine on 25.08.2010 and ordered suspension of mining activities under Rule 13 (1) of the MCDR, 1988.

In compliance to the violation the lessee again submitted the modification to the approved scheme of mining under Rule 10 of M.C.D.R. 1988. Violations of the last force of IBM had been attended in the modification to the approved scheme of mining and the modification to the approved scheme of mining was approved by IBM Bhubaneswar vide letter no-MSM/OTFMECH/61-OR/BHU/2010-11 dt.07.03.11. The validity of the approved scheme of mining is up to 31.03.2013. So to fulfill the statutory requirement of IBM the present scheme of mining is being prepared now for the year 2013-14 to 2017-18.

The lessee Sayed Abdul Halim, is a private individual, having his office at Barbil, Keonjhar, Odisha and deals with the production and marketing of minerals like Iron, manganese etc., exploited from his mines. The present Mining Scheme deals with Oraghat Iron & Manganese mine spread over an area of 25.847 ha or 63.87 acres.

The mine has been closed temporarily by the DFO, Bana from 17th February 2010 due to want of Environment clearance.

The proposed scheme of mining has been envisaged to produce about 72000 tonnes of iron ore per annum.

1.2 NEED OF SUCH REPORT

This report is prepared in order to have a technical back up on the feasibility study while codifying the reserves and resources in this scheme of mining as per the United Nations Framework Classifications (UNFC). Attempts have been made to reflect the current status of the deposits providing a detailed and accurate, up to date statement on the reserves and the remaining resources. Based on the above facts and figures the economic viability

considering a sustainable and eco-friendly mine environment has been addressed at the current market scenario and the latest technology available to achieve the goal.

1.3 LOCATION AND ACCESSIBILITY

District and State - Sundergarh, Odisha

Sub-division - Bondi

Village - Oraghat

Latitude: 21° 55' 45" N

Longitude: 85°18' 45" E

Lease area (Hectares): 25.847 Ha

1.4 PHYSIOGRAPHY AND DRAINAGE

In Oraghat Iron & Mn area there is only one hillock, which is trending NNE-SSW direction gentle sloping topography. The highest elevation within the said area is 610 m, while the lowest elevation is 580m above mean sea level. The kundra or Sunda Nala flows along the eastern boundary of the leasehold. There are no prominent drainage features within the leasehold. The relief of the area towards SW and relief difference is 30 mts.

1.5 GEOLOGY:

Regional Geology:

The Precambrian rocks of this region comprising of basic lava, tuff, banded iron formation (BIF), shales, conglomerates and sandstones etc, were mapped for the first time by Jones (1934). The stratigraphic succession established by Jones has largely been modified later by Dunn(1940). Based on detailed mapping in the northern parts of the belt, Dunn recognized a new group lying unconformably over the Iron Ore Group, which he named as the "Kohlan Group". The rock types of the area belonging to the Kohlan Group lies to the north of Nuamundi in Bihar.

The iron and manganese ore deposits in the area form a part of the South - eastern portion of the Singhbhum - Keonjhar - Boral belt, also known as the Jamda - Kaira valley and is represented by a narrow NNEly plunging folded synclinalorium of 60 km. long and 25 km. in width. The Precambrian horse - shoe shaped belt is well known for its large reserves of iron and manganese ore. The general strike is northeast to northerly and dips are moderate to the west. The western limb of the synclinalorium is slightly overturned.

Local Geology:

The Oraghat Iron & Mn Mines of Sri Syed Abdul Halim forms a part of pre-cambrian Sedimentary formation forming the western limb of the famous horseshoe shaped synclinalorium comprising of iron ore group of rocks of pre-cambrian age of Jamda - Kaira vally. The Special distribution of the iron ore deposits and occurrences of manganese ore broadly confirm to the major structure. This observation together with the fact that manganese is restricted in its occurrence to either the variegated shale or the laterite derived from the shale, bears out that there is a distinct stratigraphic control in the manganese mineralisation. physiographically the manganese ore deposits are restricted, in general to the relatively, low level plateau covered by laterite in contrast to the iron ore deposits which are found in different levels mostly at higher altitudes. It is possible that the lateritious manganese ores are the manifestation of a second period of erosion and couterization.

The iron ore located at this area is considered to be of secondary origin i.e., they are formed by desilicification of primary BHQ/BHJ rocks, which are called protores.

Reserve:

Classification	Code	Iron ore in MT	Mn ore in MT
Total Mineral Resources (A+B)		2060997	43042
A. Mineral Reserves			
(1) Proved Mineral Reserves	111	584592(Fe% 58-62)	
(2) Probable Mineral Reserves	121	0	
Probable Mineral Reserves	122	225830(Fe% 58-62)	
B. Remaining Resources			
(1) Feasibility Mineral Resources	211		
(2) Prefeasibility Mineral Resources	221	231299(F)+151231(Blocked) (Fe% 58-62) +150259 (SG,Fe% 55-58)= 532789	15900 Mn % 20-30)
Prefeasibility Mineral Resources	222	210659(F)+145343(Blocked) (Fe% 58-62) +2688 (SG,Fe% 55-58)=358690	13612(Mn % 20-30)
(3) Measured Mineral Resources	331		
(4) Indicated Mineral Resources	332		
(5) Inferred Mineral Resources	333	359096(Fe% 55-62)	13530(Mn % 20-30)
(6) Reconnaissance Mineral Resources	334		

Demonstrated mineable reserve of iron ore -563383 Mt

Demonstrated mineable reserve of iron ore -kt

Mining Method:

Semi-mechanized method of mining will be followed during the ensuing 5 years of development. It is planned to develop the mine by introduction of small excavator andippers for removal of overburden. This will be a semi-mechanized method of mining.

The mine is developed by removing first 1.0 to 2.00 meters of loose laterite with lateritic soil. Thereafter the benches are formed with the ground maintaining the height and width of 6 meter each.

QUANTUM OF PRODUCTION

Development of Iron ore

YEAR	TOTAL EXCAVATION IN m ³	OVER BURDEN IN m ³	ROM				ORE TO WASTE RATIO MT/ m ³
			CUT OFF GRADE/ HIGH GRADE ORE		SUB GRADE ORE	MINERAL REJECTS/INTER BURDEN IN m ³	
			IN m ³	IN MT			
13-14	15210	6370	6188	18564	Nil	2852	1:0.49
14-15	24221	1961	15582	48746	Nil	6678	1:0.18
15-16	24500	1050	16415	49245	Nil	7095	1:0.16
16-17	20968	6601	10057	30171	Nil	4310	1:1.08
17-18 (Till 05.04.2018)	8200	500	5530	16590	Nil	2170	1:0.23
TOTAL	76817	16282	53772	161316		23045	1:0.24
Average	18620	3256	10754	32263		4809	

CHAPTER – II

Exploration

A total of 19 nos. of coring bore holes till the end of mineralisation zone have been proposed to explore the total area in the next two years i.e. 2014-15 and 2015-16. The boreholes to study the potentiality of the deposit would be preferably coring at an interval of 50x50 m have been proposed. Based on outcome of the proposed boreholes, some more boreholes may be proposed in closer grids for both iron and manganese ore zones. Depth of boreholes would be till the end of mineralisation. It is also proposed to drill two boreholes out of the proposed 19 to go up to a depth of more than 100m to have a clear picture of the depth ward rocktype. The detail has been given below.

YEAR	FBH NO	Depth of bore hole in m	LOCATION
14-15	Core (1 to 9)	Till the end of mineralisation zone	300W-200N, 300W-300N, 300W-400N, 300W-500N, 300W-600N, 200W-600N, 200W-500N, 200W-400N, 200W-300N
15-16	Core (10 to 19)		200W-200N, 100W-600N, 100W-500N, 100W-400N, 100W-300N, 100W-200N, 100W-100N, 00-400N, 00-200N, 00-100N

CHAPTER – III

3.0 RESERVE:

SUMMARY OF THE RESERVE

Geological reserve of iron in MT							
	Block-I		Block-II		Block-III		TOTAL
	F	NF	F	NF	F	NF	
G-1	118367	286721	33915	599361	79017	0	1117381
G-2	126648	307646	9075	166215	74015	0	584520
G-3	85915	96959	5985	100328	69909	0	359096
TOTAL	330931	591326	49875	865904	222941	0	2062997

Geological reserve of Mn in forest block-III	
G-1	15000
G-2	13612
G-3	13530
Total	43042

Mineable reserve of iron in MT							
	Block-I		Block-II		Block-III		TOTAL
	F	NF	F	NF	F	NF	
G-1	117359	188158	1995	546593	75633	0	829838
G-2	102294	97952	0	131164	73290	0	404042
TOTAL	219653	286110	1995	677757	148923	0	1333880

Mineable reserve of Mn in forest land of Block-III	
G-1	15000
G-2	12540
Total	27540

Classification	Code	Iron ore in MT	Mn ore in MT
Total Mineral Resources (A+B)		2060997	43043
A. Mineral Reserves			
(1) Proved Mineral Reserves	111	584592 (Fe% 58-62)	
(2) Probable Mineral Reserves	121	0	
Probable Mineral Reserves	122	225830 (Fe% 58-62)	
B. Remaining Resources			
(1) Feasibility Mineral Resources	211		
(2) Prefeasibility Mineral Resources	221	231299 (F) + 15 (231 Blocked) (Fe% 58-62) + 130259 (SG-Fe% 55-58) = 532789	15900 Mn % 20-30)
Prefeasibility Mineral Resources	222	210659 (F) + 145343 (Blocked) (Fe% 58-62) + 2688 (SG-Fe% 55-58) = 358690	13612 (Mn % 20-30)
(3) Measured Mineral Resources	331		
(4) Indicated Mineral Resources	332		
(5) Inferred Mineral Resources	333	369096 (Fe% 55-62)	13530 (Mn % 20-30)
(6) Reconnaissance Mineral Resources	334		

Grade of Iron Ore:

As revealed from analysis of borehole samples the grade of iron ore is as below;

(a)	Iron Ore			
	Fe	-	-	>58% - <62%
	SiO ₂	-	-	<4%
	Al ₂ O ₃	-	-	<5%

Grade of Manganese Ore:

The mine is temporarily closed and the manganese ore zone is in the forest patch. Therefore, it was not possible to analyse manganese samples. However, as per earlier analysis, grade of Mn ore is as below:

Manganese Ore

Mn	-	-	Around 30%
Fe	-	-	15% (Max)
Al ₂ O ₃	-	-	<7% (acceptable upto 8%)
SiO ₂	-	-	13% (Max)
P	-	-	0.15% (Max)

CHAPTER – IV

Mine Production

During the tenure of the last scheme period the mine has been closed on 15.02.2010 as per the instruction of the DFO, Bonda, due to violation as per Para 4.4 of Guideline issued by MoEF, Govt. of India, as working in non-forest land violates FC Act 1980. The mine was temporarily closed, when IBM suspended mining operation on 25.08.2010 under Rule 13 (2) of MCDR 1968. Then the lessee submitted the modification to the approved scheme of mining and the suspension order was revoked by IBM on 11.03.11. Then the Dy Dir of Mines, Kora permitted mining operation on 15.10.2011. Again the operation was suspended by the Dy Dir of Mines, Kora on 26.11.11 due to want of Consent to Establish and Consent to Operate. After obtaining the Consent to Operate, the Dy Dir of Mines, Kora allowed mining operation on 19.02.2013. However, again the mine was suspended from 01.04.2013 due to want of approved scheme of mining.

Earlier the mining was carried out by semi-mechanised method of mining. There are five existing quarries present in the lease area. The quarry wise position at the time of suspension of the mine are furnished below. The dimensions of the existing quarries are as follows:

Quarry no.	Dimension	Top RL	Bottom RL	No of benches
Q-1	135m x 40m x 8m	595 mtr	586mtr	4
Q-2	75m x 12m x 7m	593 mtr	588 mtr	1
Q-3	45m x 40m x 4m	586 mtr	581 mtr	2
Q-4	65m x 15m x 2m	585 mtr	583 mtr	1
Q-5	110m x 35m x 2m	583 mtr	582 mtr	1

Out of five quarries three quarries namely Q-2, 3 & 4 are present in the DUC forest land & two quarries namely Q-1&5 are present in the non-forest

area. In quarry-1 and quarry-3 safety zone area of 10 meter along village road and existing power line are found disturbed due to quarrying. Similarly, 7.5m safety zone along lease boundary has been disturbed in Q-5. Excavations of safety zones in Q1, Q5 and Q3 have been made to the tune of 1500 m³, 97 m³ and 2660 m³ respectively. As the recovery % is around 70%, this disturbed zone might have produced 3150 T, 204 T & 5586 T of iron ore from Q1, Q5 and Q3 respectively. Also, it is observed that a dump exists along the safety zone in between the pillars C and D which accommodates 877 m³ waste. The area is well accessed with mines road. It is planned to develop the mine by small excavator andippers for removal of overburden. In harder patches drilling and blasting will be done. This will be a semi-mechanized method of mining of OTPM-A category mine. Staging and sorting of ore will partly done by manual laborers and partly through mobile crushing and screening plant. Before winning of ore, development of loose lateritic waste to the tune of 1 m to 2 m thickness is being undertaken.

YEAR-WISE PRODUCTION FOR THE ENSUING PERIOD (2011-2012 to 2015-16)

Development of iron ore

YEAR	TOTAL EXCAVATION IN m ³	OVER BURDEN IN m ³	RDM				ORE TO WASTE RATIO MT/ m ³
			CUT OFF GRADE/ HIGH GRADE ORE		SUB GRADE ORE	MINERAL REJECTS/INTER BURDEN IN m ³	
			IN m ³	IN MT			
13-14	15210	6370	6188	18564	NH	2652	1:0.49
14-15	24221	1961	15582	46746	NH	8678	1:0.18
15-16	24500	1050	16415	49245	NH	7035	1:0.16
16-17	20968	6601	10057	30171	NH	4310	1:1.08
17-18 (Till 05.04.2018)	8200	300	5530	16590	NH	2370	1:0.23
TOTAL	70817	16282	53772	161316		23045	1:0.24
Average	18620	3296	10754	32263		4609	

METHOD OF MINING

A system of semi-mechanisation shall be adopted in the mines in which excavation and loading of overburden/waste material being done by using hydraulic excavator. Rear dump trucks of 10 MT payload capacities shall be used for transport of ore and overburden/waste material. Wagon drill & shallow jack-hammer will be utilised to loose the iron ore formation. Deploying manual labour does sizing, sorting and stacking of ore for despatch.

Machineries and equipments in Oraghat mines

Machines	Capacity	No
Excavator	0.9m ³	1
Wagon drill	-	1
Rock Breaker attachment	-	1
Jack hammer	—	1
Air compressor	12 m ³ /min	1
Truck/Tipper	10 MT	2
Mobile crushing & screening plant	50tph	1
Safety equipments as per DGMS specification		As necessary
Iron hammer, crowbar, basket, fork and spades as required		As necessary

HANDLING OF WASTE / SUB-GRADE MATERIAL

Laterite, lateritic-Soil, and ferruginous shale etc constitute over burden and inter burden materials of Oraghat Iron & Mn Ore mines.

Yearly generation of waste (interburden & over burden) is being given below.

Waste generated from Iron quarry (Q-1)

YEAR	VOL OF WASTE AS IB (m ³)	VOL OF WASTE AS OB (m ³)	VOL OF TOTAL WASTE (m ³)	SWELLED VOL OF WASTE (m ³)
(1)	(2)	(3)	(4)	(5) = (4) x 1.4
2013-14	2652	6370	9022	12631
2014-15	6678	1961	8639	12095
2015-16	7035	1050	8085	11319
2016-17	4310	6601	10911	15276
2017-18	2370	300	2670	3738
Total	23045	16282	39327	55058

PROPOSED DUMP (YEARLY DEVELOPMENT)

During the ensuing scheme period mining activities will be confined in the Iron quarry i.e. Q1 only. A quantity of 39327 m³ vol. of waste (swell waste-55058m³) will be generated from the Iron quarry in the ensuing scheme period. One dump exists over an area of 1350m² at the eastern side of the lease area accommodating 877 m³ waste. It has been proposed to dump the generated waste on dump-A at the earmarked site of the lease area. In the ensuing scheme period a total vol. of 39327 m³ waste will be generated. The waste generated from the quarry in the ensuing scheme period shall be accommodated in the dump-A. Dump A has been proposed at the site over plot 194 where the lessee possesses surface right. Safety zone areas in Q-3 & Q5 and safety zone along village road in Q1 are found to be disturbed due to mining. A total vol. of 4257m³ has been excavated from the safety zone of the above said quarries. So it has been proposed that the waste of existing dump of vol. 877m³ shall be rehandled during 2013-14 to backfill these disturbed safety zones. The remaining required waste of vol. 3380 m³ shall be procured from the generated waste of mining operation for the same year.

The proposed dump A will be spreading over total area of 3910 m². Dump-A is proposed to be encircled by retaining wall and gabion drain

connected to settling tank. Dumping in Dump - A will be advanced in western direction in retreating fashion. It is calculated that 55058 m³ of waste shall be generated in the scheme period from iron ore mining. Out of this 3380 m³ waste from 2013-14 will be utilised for backfilling purpose of disturbed safety zone area. Remaining 51678 m³ will be dumped on the dump-A. Dump-A will acquire 0.391 ha. Height of Dump - A is proposed at 20m with two terraces each of 10 m height. **(Ref. Plate No. VII)**

The Protective measures and precautions to be under taken for the waste dump the management shall be as follows:

- i) The ultimate dump slope will be maintained at 20°-22° with individual terraces slopes not exceeding 37°.
- ii) The individual terrace heights will be maintained at 10m.
- iii) Each terrace will have inward slope with catch drains at the inward side of the terrace.
- iv) The catch drains of the individual terrace will be connected to the galand drain outside the periphery of the dump.
- v) These catch drains will have half concrete open pipes followed by settling tanks to avoid wash offs.
- vi) Each terrace will also have a provision of berms at the outer end to reduce gully formation due to rain water wash offs.
- vii) The retaining wall has to be made to arrest the waste dump materials for consolidation.
- viii) Galand drains are to be paved around the dump to arrest possible wash off in rainy seasons.
- ix) Suitable grass/plant species will be paped in the dump slope, which will hold the materials in its fibrous and spread over roots to protect wash off in the rainy seasons.

- a) Plantations of grass and sapling will be done from the year 2013-14 onwards.

Generation of sub-grade

In case of iron ore depending upon the chemical composition of other batch materials, various steel plants utilise iron ore within certain limits and the Fe₂O₃ content of ore usually varies between 58%-65%. In the major industry this is the lowest grade of ore that is generally used and thus marketed and in general there is no market below this grade.

Iron ore having Fe₂O₃ content in between 45 to 58% is not having any market at present but due to high content of Fe in comparison to general waste material, this ore is separately stocked as sub-grade ore with a view to have market in future or to be blended with high grade ore.

Although sub-grade ore exists in the leasehold as evidenced from Chapter II, there will be no production of sub-grade ore during the ensuing scheme period.

CHAPTER – V

Mining Method

Semi-mechanized method of mining will be followed during the ensuing 5 years of development. It is planned to develop the mine by introduction of small excavator and tippers for removal of overburden. This will be a semi-mechanized method of mining.

The mine is developed by removing first 1.0 to 2.00 meters of loose laterite with lateritic soil. Thereafter, the benches are formed with the ground maintaining the height and width of 6 meter each.

Machineries and equipments in Oraghat mines

Machines	Capacity	No
Excavator	0.9m ³	1
Wagon drill	-	1
Rock Breaker attachment	-	1
Jack hammer	—	1
Air compressor	12 m ³ /min	1
Truck/tipper	10 MT	2
Mobile crushing & screening plant	50tph	1
Safety equipments as per DGM5 specification		As necessary
Iron hammer, crowbar, basket, fork and spades as required		As necessary

CHAPTER – VI

Beneficiation

At present there is only a screening plant of 50 TPH capacity in the leasehold to screen the ore to different sizes. Lessee has a plan to install one mobile crushing plant of same capacity in near future.

The ore recovered during excavation constitutes about 70% iron ore. These recovered quantities after manual sorting are fed to the screening plant, for output in the size range of 5mm to 40mm.

Quality of Ore:

For iron ore, it is proposed to install a crushing plant apart from the existing screening plant. The mechanical beneficiation plant will be installed in the lease hold. The feed size will vary from 10 mm to 100 mm. Generation of fines will be to the tune of 30% of the total feed after due crushing.

The physical and chemical characteristics of the R.O.M., iron ore to be supplied after crushing are given below:

<u>Constituents</u>		<u>Av. Product grade</u>
Fe	-	> 58% - < 62%
SiO ₂	-	< 4%
Al ₂ O ₃	-	< 5%
Feed size	-	- 400 mm, + 100 mesh,
Product size	-	Lump- 5 – 18mm, 10 – 40mm, Fines- 0-5mm.

CHAPTER – VII

DETAILS OF USE

There is no change in the market policy for use of iron & Manganese ore so far as Oraghat mine is concerned. At present the iron ore is supplied to MMTC and pig / sponge iron plants, and other plants by the local traders in the domestic market.

Specification imposed by user agency

a) Sponge iron:

Fe	Al ₂ O ₃ + Si O ₂	P	Moisture	LOI	Size
>58%	5%	0.05%	4%	3%	5 to 18%
<62%			Maximum	maximum	

b) Steel plant:

Fe	Al ₂ O ₃ + Si O ₂	P	Moisture	LOI	Size
58% to 62%	5%	0.06%	4% Maximum	2% maximum	10 to 40 mm

CHANGE IN SPECIFICATIONS:

The Buyers specification on iron ore utilisation in sponge iron plant and steel plant are given above. The grade of the iron ore produced from lease hold matches with the consumption characteristics of the sponge iron plant and steel plant. Therefore it is not required to change the specification of iron ore for supply to these industries from Oraghat iron ore mines.

EFFORTS MADE FOR UTILISATION OF THE SUB-GRADE MINERAL INCLUDING FINES

Iron ore containing less than 56% and more than 45% Fe has been considered as sub-grade. As such there will be no production of sub-grade ore in the ensuing scheme period as evidenced from the development table of Chapter V. If, any sub-grade is generated in due course of mining, shall be blended with high grade ore to be made saleable.

CHAPTER – VIII

Infrastructure:

Existing

For proper functioning of the day to day operation of the mine, maintenance and servicing facilities, the following buildings have been envisaged for the project.

Proposed

Rest sheds, blasting shelters are proposed to be provided near the quarries. Wholesome drinking water and first-aid facilities are proposed to be kept ready while working.

CHAPTER – IX

ENVIRONMENTAL ASPECTS

SALENT ITEM (1)	PROPOSAL AS PER APPROVED SCHEME OF MINING (2)	POSITION AT THE END OF 5 YEARS OF SCHEME OF MINING PERIOD (3)	PROPOSAL IN THE ENSUING SCHEME PERIOD (4)
Top soil storage, preservation and utilisation	There is no existence of top soil in the area hence there is no proposal	No topsoil was generated in the mining areas.	Since there is no generation of top soil, no proposal for preservation of the same is envisaged. One soil sample station is proposed as per EC in the buffer zone for soil analysis (Plate I).
Land reclamation and rehabilitation	Since all the pits are in mineralised zone and resource is yet to be established fully, no proposal has been envisaged. It was proposed that reclamation will start in the conceptual period. It was proposed in the modification to the approved mining scheme to backfill Quarry-5 as it is situated within the safety zone of the High power transmission line.	No reclamation has been done. Backfilling has not been taken up in Quarry-5 as the area is ore bearing. However, lessee is taking steps for shifting of the existing power line.	Since all the pits are in mineralised zone and resource is yet to be established fully, no proposal has been envisaged to reclaim any quarry in the ensuing scheme period.
Waste dump management	A total quantity of 99534m ³ of waste from the iron quarry	As the mine was closed due to lack of forest clearance no	One dump has been proposed at the eastern side of the

	and 67294 m ³ from the manganese quarry was calculated to be generated which was supposed to be dumped in proposed dumpsite.	waste was generated.	lease boundary to dump the waste generated from the iron quarry. The dump will acquire over an area of 0.391 ha. The dump will be encircled by retaining walls and gulland drains to prevent wash off from the dumps. A water gulland has been proposed along the village road to prevent rain water in to quarry.
Afforestation programme with precautions for survival & protection of plantation	3376 nos. of saplings were to be planted over 2.0 ha. within 5 years period.	No plantation was taken up as the mine was closed.	Total 1.046 ha of land will be subjected to plantations and 1702 nos. of saplings will be planted for the purpose. (year wise details is given below)

However in the ensuing scheme period the 10 meter safety zone area along the village road adjacent to Q1, 7.5 meter safety zone along the mine boundary of Quarry 3 and the safety zone of the existing powerline near Quarry 5 have been proposed for backfilling in the year 2013-14 and plantation has been proposed over backfilled area in the year 2014-15. The following table shows the backfilling and rehabilitation programme for the ensuing scheme period.

Year	Location	Area in m ²	Vol. of waste required in m ³	Waste to be utilized from
2013-14	10meter along village road of Q1 & 7.5 meter safety zone along mine boundary of Q3 & safety zone of the powerline Q5	1802	4257	Existing dump and waste from Q-1

The year wise program of tree plantation in safety zone is being given in below table:

Year	Area (m ²)	Type of saplings	No. of saplings	Distance between saplings (m x m)
2013-14	1687	Anacardium occidentale	306	2.5 x 2.5
2014-15	3902	Punica granatum	600	2.5 x 2.5
2015-16	2100	Psidium guajava	342	2.5 x 2.5
2016-17	1050	Mangifera indica	182	2.5 x 2.5
2017-18	1725	Ziziphus jujuba	272	2.5 x 2.5
Total	10464		1702	

SALIENT ITEM (1)	PROPOSAL AS PER APPROVED SCHEME OF MINING (2)	POSITION AT THE END OF 5 YEARS OF SCHEME OF MINING PERIOD (3)	PROPOSAL IN THE ENSUING SCHEME PERIOD (4)
Quality & make of water including surface and ground water	No commitment was made in the approved scheme of Mining, as the area remains dry throughout the year except monsoon months. Hence, there was no chance of depletion of ground water. Mining activities have no effect on water quality.	No monitoring of water quality was done on regular basis. As no mining activity was carried out during the period, hence no impact on water quality. No effect on ground water.	To prevent wash off of fines from dumps, retaining wall, garland drain and settling tank will be provided to avoid pollution of perennial source of water around the dumps. In this scheme period in 2013-14 retaining wall of 155m x3m x2m and garland drain of 165mx2mx3m will be constructed around dump-A. Quarterly monitoring of water quality will be done and for the purpose, two water quality monitoring stations each in the core zone and buffer zone will be erected (Plate I). The slope of the area is from west to east. Therefore it is proposed to construct a garland drain along the western boundary of the leasehold not to allow the surface run-off of outside to enter the lease area from the western side. This retaining wall will be jointed to another

			garland drain to drain the surface-run off of the leasehold to Suna river. Ground water if discharged from the quarries and the collected surface water of the quarries will also be pumped out to this garland drain. For settling down the suspensions and to prevent the water from pollutants three settling tanks are also proposed to be made. This network of garland drain and settling tank would be constructed in 2014-15.
Noise level	No commitment was made in the approved scheme of Mining	No mining activity was envisaged hence there was no Noise.	Regular monitoring of noise at various potential points will be carried out. Quarterly monitoring of noise level will be done and for the purpose, five noise sampling stations in the core zone and 2 stations in the buffer zone are proposed (Plate I).
Vibration	No commitment was made in the approved Mining Plan.	No mining activity was envisaged, hence there was no Vibration.	Control blasting technique will be adopted by competent persons. Quarterly monitoring

			of air quality will be done and for the purpose, seven air sampling stations in the core zone and 2 stations in the buffer zone are proposed (Plate I).
Treatment of mine water and effluent / toxic substances before discharge	Settling tank has been proposed	No treatment is done as there is meagre production, hence less chance of contamination of water by toxic element.	Settling tank will be constructed for the purpose to prevent the water from pollutants.
Recirculation of treated water	Recirculation not required.	Not required	Not required

Construction of garland drains

Year	Location	Particulars and Size (Length x Breadth x Depth) in (m)
2013-14	Eastern part of the lease around dump-A	165 x 2 x 3
2014-15	Along western boundary of the lease area and joining this to Sunda river (Plate VII)	800 x 2 x 2

Construction of retaining wall

Year	Location	Particulars and Size (Length x Breadth x Height) in (m)
2013-14	North-eastern part of the lease around dump-A	155 x 3 x 2

CHAPTER – X

OTHERS

Tribal Issues

The tribal people of the near by villages work in the mines and get employment and earn their livelihoods. There is no local agitation against mining.

National Park-

There is no national park within and around the leasehold area. So mining will not be a problem in respect of this.

CONCEPTUAL PLANNING

Anticipated life of the mine

The demonstrated reserve of iron ore within the area has been worked out to be 963369 MT. The max annual output of the mines in a year has been envisaged to be around 49245 MT. At this rate of annual output of the mines the reserve will last for a period of about 19.56 or say 20 years from now. However, this may not hold well all the time. By making assessment of reserve from time to time the life of the deposit may increase or decrease.

The mineable reserve of Manganese under proved category within the area has been worked out to be NIL. No proposal has been submitted for manganese ore as exploration has not been taken up in the area. This will be planned after completion of exploration.

Efforts will be made to drill exploratory boreholes into probable reserve zones to convert it to proved category whereby the life of the mines may increase. The ultimate pit limit will be revised as per the results of exploration.

At the present market condition, economic depth of the mine can be assumed to be 40m from the surface.

The ultimate extent and size of the pit

Ultimately the total mineralized area will be mined out in three blocks namely i.e. Block-I, Block-II and Block-III (plate VIII). During the course of mining conceptually the block-I and Block-III will be merged in to a single quarry and ultimately the extent of ultimate pit limit will be 70400 m². The ultimate mined out area of Block-II will be 12728m². The total ultimate pit limit area of the conceptual period will be 83128 m². Both lateral & depth-wise UPLs have been demarcated based on findings of boreholes and existing quarries and are shown in conceptual plan and sections.

Ultimate pit limit has been fixed based on outcomes of boreholes, existing outcrop of the ore and findings of quarries. Based on the current exploration status, depth of UPL will go up to 565 m and 557 m in Block-I and Block-II respectively. The dimension of merged Block-I & Block-II is 435mx160mx25 m and dimension of Block-II is 150mx85mx20m.

Ultimate slope angle

During proposed scheme period, the individual benches will be kept nearly vertical. Ultimate pit slope will be kept at 45° with the horizontal by maintaining height and width of benches at about 6m.

Ultimate pit limit boundaries

Ultimate pit limit boundaries have been earmarked in conceptual plan and sections[Ref plate no – VIII & VIIIA].

Ultimate capacity of the dump

During the ensuing scheme period mining activities will be confined in the iron quarry i.e Q1 only. A quantity of 39327 m³ vol. of waste (swell waste- 55058m³) will be generated from the iron quarry in the ensuing scheme period. One dump exists over an area of 1350m² at the eastern side of the lease area accommodating 877 m³ waste. It has been proposed to dump the generated waste on dump-A at the earmarked site of the lease area. In the ensuing scheme period a total vol. of 39327 m³ waste will be generated. The waste generated from the quarry in the ensuing scheme period shall be accommodated in the dump-A. Dump A has been proposed at the site over plot 194 where the lessee possesses surface right. Safety zone areas in Q-3 & Q5 and safety zone along village road in Q1 are found to be disturbed due to mining. A total vol. of 4257m³ has been excavated from the safety zone of the above said quarries. So it has been proposed that the waste of existing dump of vol. 877m³ shall be rehandled

during 2013-14 to backfill these disturbed safety zones. The remaining required waste of vol. 3380 m³ shall be procured from the generated waste of mining operation for the same year.

The proposed dump A will be spreading over total area of 3910 m². Dump-A is proposed to be encircled by retaining wall and garland drain connected to settling tank. Dumping in Dump A will be advanced in western direction in retreating fashion. It is calculated that 55058 m³ of waste shall be generated in the scheme period from iron ore mining. Out of this 3380 m³ waste from 2013-14 will be utilized for backfilling purpose of disturbed safety zone area. Remaining 51678 m³ will be dumped on the dump-A. Dump-A will acquire 0.391 ha. Height of Dump - A is proposed at 20m with two terraces each of 10 m height.

It has been also proposed one more dump over 1.082 ha. comprising of 3 nos. of terraces to accommodate the generated waste conceptually. The ultimate capacity of dump is 435073m³ with top RL 615meter.

Stacking of sub-grade ore, Top-soil & Mineral rejects

No topsoil/mineral rejects will be generated during conceptual period. As per present calculated reserve, there will be no sub-grade ore. However, it is expected that some amount of sub-grade ore may be generated during conceptual period which is proposed to be fully utilized by blending with high grade ore. So no separate stack has been earmarked for the purpose of stacking sub-grade due to this reason.

Land degradation/reclamation/Afforestation

During conceptual period an area of 8.1323ha will be degraded for mining. There is no proposal for reclamation of any quarry during this scheme period as there will be no exhaustion of ore achieved by any

quarry during this period. Also, the exploration is yet to be completed and the depth of occurrence of ore is still unknown.

It is planned to reclaim the mine out land by backfilling. The stored wastes of the dumps will be used for the purpose. Simultaneous backfilling will commence from the next scheme period when there will be sufficient excavated area, which can be backfilled.

However in the ensuing scheme period the 10 meter safety zone area along the village road adjacent to Q1, 7.5 meter safety zone along the mine boundary of Quarry 3 and the safety zone of the existing powerline near Quarry 5 have been proposed for backfilling in the year 2013-14 and plantation has been proposed over backfilled area in the year 2014-15. The following table shows the backfilling and rehabilitation programme for the ensuing scheme period.

Year	Location	Area in m ²	Vol. of waste required in m ³	Waste to be utilized from
2013-14	10meter along village road of Q1 & 7.5 meter safety zone along mine boundary of Q3 & safety zone of the powerline Q5	1802	4257	Existing dump and waste from Q-1

Post mining land use pattern

Below table depicts the post mining land use pattern.

Categories	Area at present (Ha)	Area during scheme period (Ha)	Total Area (Ha)	Area at the conceptual period (Ha)
Area to be excavated for mining	1.47	0.32	1.79	8.312
Mineral Storage	0.163	0.382	0.545	Nil
O.B dump	0.135	0.391	0.526	Nil
Road	0.786	0.110	0.896	Nil
infrastructure	0.011	Nil	0.011	Nil
Magazine	Nil	0.037	0.037	Nil
Green belt	Nil	1.046	1.046	3.8735
Total	2.565	2.286	4.851	12.185

An area of 1.79 hect. of land will be degraded during the scheme period for mining and allied activities. At the end of the scheme period 1.046 Ha of area will come under plantation.

Similarly, a total of 8.312 Ha of land will be utilized for mining during conceptual period of the mine with present status of exploration.

The lessee has a plan to drill some boreholes in the area to prove the ore. After delineation of the ore body the limit of excavation will be certainly changed.

CHAPTER – XI

Economic Evaluation

COST BENEFIT ANALYSIS

The exploration results are very much promising and the future exploration programme is expected to add more life and resources to the mine. The average rated capacity of 32263 MT of iron ore per annum not only is viable but also gives appreciable return on the investment. There is ample scope for further development after this phase of expansion due to additional minable reserve expected after exploration.

CAPITAL INVESTMENT

The capital cost covers the expenditure incurred towards Exploration, Mine development already done and proposed, cost involved towards land, building, infrastructure, plant and machineries etc. Besides the interest during development stage insurance, margin money on working capital, contingencies etc have also been included in the figures. The details of the break ups are furnished below.

Sl.No.	Major Head	Amount in lakh
1	Exploration & Development	25.00
2	Land, Building & Infrastructure	15.00
3	Plant, Machinery & Equipment	15.00
4	Other facilities	5.00
5	Cost towards Net Present Value	-
6	Compensatory Afforestation cost	-
7	Wild Life Management cost	-
8	Capital cost towards environmental monitoring and recurring cost towards control measures.	30.00
Total		90.00

Escalations and tax structure will also have a major impact. Many item of works may be required to be outsourced depending on the situations prevailed during the time of execution. Apart from the above cost the following cost are also considered in the capital cost of the project considering the present level of resource assessment.

COSTS TOWARDS FINANCIAL ASSURANCE: Rs 2 lakh

COST OF ABANDONMENT

Sl No	Item	Activity	Infrastructure	Cost (Lakh Rs)
1	Decommissioning	Dismantling	Administrative and	1.00
		Demolition	service buildings	
		Disposal	Support facilities	1.00
2	Removal of infrastructure	Transportn. Infrastructure	Road (other than Requirement)	1.00
3	Removal of equipment	Mining Equipment	Shovel & tippers	1.00
4	Site services	Providing Stability	Barbed wire fencing / Safety walls / bands etc	-
5	Reclamation/ mitigation measures	Providing Construction	Check dam, Garland drain Settling tank. Tailing dam Waste dump. Waste dump stabilization	5.00
6	Reclamation Rehabilitation	Re-handing of Dump for Back filling	Concurrently	284.00
		Reclamation & rehabilitation	Vegetation/plantation Etc	18.00
7	Monitoring	Environmental Protection Measures	Equipment and instrument used for the purpose	-
			Collection of samples testing / analysis of pollutants. waste materials	-
			Data collection And	2.00

			evaluation of information gathered	
			Salary / wages for people engaged for the purpose	3.00
8	Retrenchment	Compensation	In case of retrenchment excluding executives	-
			Training for alternate job	-
			Extended facilities to the affected community	-
9	R & D	Related to Rehabilitation	Re-vegetation	-
10	Admn. Mgmt	Preparation of FMCP		2.00
		Procurement of data		-
Total				318.00

RECURRING INVESTMENT

The cost towards salary and wages, contractual services, overheads, maintenance of infrastructure, environment care and peripheral development, taxes and financial cost including interests have been included in the recurring cost of the project. The variable cost covers the consumption of diesel, explosives, lubricants, spares of HEMM, repair and maintenance of various areas, taxes, cess royalty etc have been considered in the recurring costs. The details are enumerated below:

STATUTORY DUES:

The mines shall contribute Rs 128 lakh per annum to the State exchequer by way of mining revenue and taxes.

COST TOWARDS ENVIRONMENTAL CONTROL

Activities	Recurring cost (Lakhs Rs./y)
a. Pollution control	0.5
b. Pollution monitoring	0.2
c. Occupational safety	0.3
d. Green belt	1
e. Socio-economic welfare measures in nearby villages	1
Total	3.00

COST TOWARDS PERIPHERAL DEVELOPMENT:

Rs 2.00 lakh per annum

COST TOWARDS SOCIO-ECONOMIC ASPECTS, LEGAL ASPECTS & CLEARANCES: Rs 2.00 lakh per annum

COST RELATING TO FACTORS LIKE TRIBAL ISSUES, NATIONAL PARKS, SANCTUARIES, WATER BODIES ETC:

There is no such issue for the particular mine.

COST OF PRODUCTION

The cost of production at the present rate comes to Rs 960/- per MT as described below.

Cost of Excavation- 294/-

Transportation of muck/debris including loading – 200/-

Transport of RoM- 180/-

Sorting, Dressing and picking of ore- 120/-

Collection of Saleable ore- 20/-

Cost of Supervision- 50/-

Safety Appliances- 6/-

Stacking of Ore- 40/-

Misc- 50/-

Total 960/- per MT i.e. Rs 310 lakh per annum

BENEFIT

The following quantities of the iron ore is planned to be produced annually with the size distribution and the average price at mines/plant head as indicated below.

Sized iron ore	5-18 mm size	22584MT	@ Rs 5000.00
Iron ore Fines	0 – 5 mm	9679 Mt	@1600.00

Hence, the annual sale value of the iron ore at the mines head would be Rs.1284.00 lakh.

FINANCIAL APPRAISAL

Figures are in Rupees lakh over 20 years (Till life of the mine)

Sl.No.	Particulars	Cost	Benefit
A. CAPITAL INVESTMENT			25680.00
1	Total cost of the project	90.00	
2	Financial Assurance	2.00	
3	Cost of Abandonment	318.00	
Sub-Total		410.00	
B. RECURRING INVESTMENT			
4	Statutory dues Tax & Royalty	2560.00	
5	Cost of Environmental control measures	60.00	
6	Cost towards peripheral development	40.00	
7	Cost towards socio-economic aspects, legal aspects & clearances.	40.00	
8	Cost of production	6200.00	
Sub-Total		8900.00	
G. Total		9310.00	

Net Benefit at the end of the project at the present rate is Rs 16370.00 lakh. The ratio of Cost to benefit comes to be 1:1.75 or 1:2. Therefore the project is feasible.

No. : 190100

**IDBI BANK LIMITED**

Branch: IDBI HOUSE, SECOND FLOOR, JANPATH, UNIT - IX, BHUBANESWAR,
DIST - KHURDA - ODISHA - 751022

To
THE REGIONAL CONTROLLER OF MINES
INDIAN BUREAU OF MINES
BHUBANESWAR
BHUBANESHWAR
ODISHA-751016

Dear Sir/Madam,

Bank Guarantee No. 13037980P00015
Amount (Rs.) 200000.00
Guaranteed Cover From: 05-07-2013 To: 05-04-2018
Last date for Lodgement of Claim: 05-04-2018

This deed of guarantee executed by IDBI Bank Ltd., a company constituted under the Companies Act 1956 and deemed to be a banking company under the Banking Regulation Act, 1949, having its Registered Office and Head Office at IDBI Tower, WTC Complex, Cuffe parade, Mumbai-400005, and among other places a branch at IDBI HOUSE, SECOND FLOOR, JANPATH, UNIT - IX, BHUBANESWAR, DIST - KHURDA - ODISHA - 751022.

Hereinafter referred to as "The Bank") in favour of
THE REGIONAL CONTROLLER OF MINES, INDIAN BUREAU OF
MINES, BHUBANESWAR, BHUBANESHWAR, ODISHA-751016.

Hereinafter referred to as "The Beneficiary" _____
for an amount not exceeding Rs 200000.00
(Rs Two Lakh only)

at the request of: M/S. SAYED ABUL, HALIM
Hereinafter referred to as "The Contractor(s)" _____

This Guarantee is issued subject to the condition that the liability of the bank under this Guarantee is limited to maximum of Rs 200000.00
(Rs Two Lakh only)

and the Guarantee shall remain in full force up to 05-04-2018 (expiry date) and can not be invoked otherwise than by a written demand under this Guarantee served on the Bank on or before the 05-04-2018 (last claim date).

The beneficiary in its own interest is advised to seek a confirmation of the issuance of this Guarantee from the controlling officer/Head Office TPO address.

IDBI BANK LTD.,
Trade Finance Dept.,
8th Floor,
IDBI Tower
WTC complex
Cuffe Parade, Mumbai-400005
enclosing a copy of the same.

This Guarantee consists of 4 pages including this page.

Anup Ghose

अनुप कुमार शर्मा/Anup Kumar Sharma
सहकारी: एजी/Employee Code: 620464
मैनेजर/Manager
सहकारी/अधीनस्थ
IDBI Bank Ltd./TPO/Sec-379
सहकारी/अधीनस्थ/भुवनेश्वर-751022/Sec-404



मुख्य प्रतिनिधित्व कर लेखिका
FOR IDBI BANK LIMITED

Chandrabhanu Das
मुख्य प्रतिनिधित्व कर लेखिका
मुख्य/Manager
मुख्य/अधीनस्थ

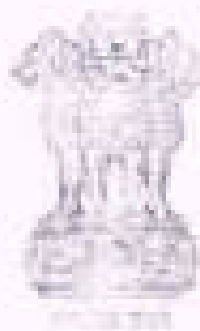
CHANDRABHANU DAS
ROP/BS/052/2004/A

भारतीय गैर न्यायिक

एक सौ रुपये

Rs. 100

रु. 100



ONE
HUNDRED RUPEES

भारत INDIA
INDIA NON JUDICIAL

ओडिशा ORISSA

F 408165

The Regional Controller of Mines,
Indian Bureau of Mines,
Mahani Complex, 2nd Floor,
308, District Centre,
Chandrasekharpur, Bhubaneswar.

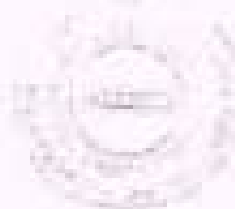
Dear Sir,

Guarantee No.130379BGF00018
Amount of Guarantee Rs. 2,00,000/-
Guarantee Period from 05.07.2013 to 05.04.2018
Last date for lodgement of claim 05.04.2018

This Deed of guarantee executed on 5th Day of July, 2013 by IDBI Bank Limited (bank name) constituted under the Companies Act, 1956, having its Central Office at IDBI Tower, WTC Complex, Cuffe Parade, Mumbai - 400 005 and amongst other places, a Branch at IDBI House, Second Floor, Janpath, Unit - IX, Bhubaneswar - 751022 in favour of the Regional Controller of Mines, Indian Bureau of Mines Bhubaneswar (hereinafter referred to as the Beneficiary) for an amount not exceeding Rs. 2,00,000/- (Rupees Two Lakh only) at the request of M/s Sayed Abdul Hakim (hereinafter referred to as the Contractor/s).

This guarantee is issued subject to the condition that the liability of the bank under this guarantee is limited to maximum of Rs. 2,00,000/- (Rs. Two Lakh only) and the guarantee shall remain in full force up to 05.04.2018 (date of expiry) and cannot be revoked on or before 05.04.2018 (last date of claim) by the Regional Controller of Mines, Indian Bureau of Mines Bhubaneswar in writing.

अरुण कुमार घोष/ Arun Kumar Ghose
कर्मचारी IDB/Employee Code:029494
निर्देशक/Manager
चन्द्रशेखरपुर में नि
IDBI Bank Ltd. (सीएम/सी-379)
चन्द्रशेखरपुर, 751022 (Bhubaneswar-751022) (Orissa)



चुने भारतीय बीडी बैंक लिमिटेड
एन आईडीबी बैंक लिमिटेड

चुने भारतीय बीडी बैंक लिमिटेड
एन आईडीबी बैंक लिमिटेड
चुने भारतीय बीडी बैंक लिमिटेड

CHANDRABHANU DAS
RQIBBS/052/2006/A

BANK GUARANTEE No.	130379803P00015
BG ISSUE DATED	6 Jul 2013
BG AMOUNT	Rs.2,00,000/-
BG VALID UPTO	05 Apr 2018
BG CLAIM VALIDITY DATE	05 Apr 2018

SUBJECT TO AS AFORESAID

BANK GUARANTEE AND CO-ACCEPTANCE BOND

1. Agreement on production of a Bank guarantee for Rs. 2,00,000/- (Rs. Two Lakh only) under rule 23F of MCDR, 1988.
2. We IDBI Bank Limited, at the request of Shri Sayed Abdul Halim, (lessee) do hereby undertake to pay to the Regional Controller of Mines, Indian Bureau of Mines Bhubaneswar or any other officer authority nominated by the Controller General, Indian Bureau of Mines an amount not exceeding Rs. 2,00,000/- (Rs. Two Lakh only) against any loss or damage caused to or suffered or would be caused to or suffered by the Government or towards non compliance of provisions of Rules 23A, B & 23E of MCDR, 1988 i.e. Mine closure plan, progressive mine closure plan approved in respect of the mining lease No. 1069 as per State Govt. Letter No. IID(SM-396/9562 dated 01.10.1996 for iron (ore/ores) over an area of 25.547 Hects. granted by State Government to Shri/Ms Syed Abdul Halim (lessee) situated in Oraghat Village, Bonal Taluka, Sundergarh District, Odisha State by reason of any breach of the said lessee or any of the terms or conditions contained in the Mine closure plan / progressive mine closure plan.
3. We IDBI Bank Limited (bank) do hereby, undertake to pay the amount due and payable under this guarantee without any demurr, to the authority merely on a demand other authorized by the Regional Controller of Mines, Indian Bureau of Mines Bhubaneswar or any other authorized by the Controller General, Indian Bureau of Mines stating that the amount claimed is due by way of loss or loss of damage caused to or would be caused to or suffered by the government by reason of breach by the said lessee or any of the terms or conditions contained in the mining plan/mining scheme or by reason of lessee's failure to perform the said mine closure plan/ progressive mine closure plan. Any such demand made on the bank under this guarantee. However our liability under this guarantee shall be restricted to an amount not exceeding Rs. 2,00,000/- (Rs. Two Lakh only).
4. We undertake to pay to the authority on a demand from the Regional Controller Mines, Indian Bureau of Mines, Bhubaneswar or any other officer authorized by the notwithstanding any dispute or disputes raised by the lessee in any suit or proceedings pending before any court or tribunal relating thereto our liability under this present being absolute and unequivocal.
5. The payment so made by us under this bond shall be valid discharge of our liability for payment there under and lessee shall have no claim against us for making such payment.

Anup Kumar Ghose
 Anup Kumar Ghose
 Branch Manager
 IDBI Bank Ltd. (CRR/564-375)
 Regional Office/Bhubaneswar-751022(Odisha)



For IDBI BANK LIMITED

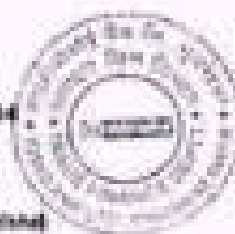
Chandrabhanu Das
 Chandrabhanu Das
 Branch Manager
 IDBI Bank Ltd. (CRR/564-375)

CHANDRABHANU DAS
 RQP/BBS/052/2004/A

BANK GUARANTEE No.	130379HOP00015
BG ISSUE DATED	8 Jul 2013
BG AMOUNT	Rs. 2,00,000/-
BG VALID UPTO	05 Apr 2018
BG CLAIM VALIDITY DATE	05 Apr 2018

6. We, IDBI Bank Limited (bank name), further agree that the guarantee herein contained shall remain in full force and effect during the period up to the end of the Mining plan/ Scheme of Mining period of five years that would be taken for performance of the said Agreement and that shall continue to be enforceable till all the dues of the Govt. under or by virtue of the said agreement have been fully paid and its claims satisfied or discharged till Regional Controller Mines, Indian Bureau of Mines, Bhubaneswar or any other officer authorized by the Controller General, Indian Bureau of Mines certifies that the terms and conditions of the said progressive mine closure plan/ final mine closure plan have been fully and properly carried out by the said lessee and accordingly discharge this guarantee. Unless a demand or claim under this guarantee is made on us in writing on or before 05.04.2018, we shall be discharged from all liability under this guarantee thereafter.
7. We further agree that Regional Controller Mines, Indian Bureau of Mines, Bhubaneswar or any other officer authorized by the Controller General, Indian Bureau of Mines shall have fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said agreement or to extend time of performance by the said lessee from time to time or to postpone for any time or from time to time any power exercisable by Regional Controller of Mines, Indian Bureau of Mines Bhubaneswar against the agreement, we (bank) shall not be relieved from our liability by reason of any such variation part of Regional Controller of Mines, Indian Bureau of Mines, Bhubaneswar or any indulgence by Regional Controller of Mines, Indian Bureau of Mines, Bhubaneswar to the said lessee or any manner or thing whatsoever which under the law relating to sureties would but this provision have effect of so relieving us.
8. This guarantee will not be discharged due to change in constitution of the bank or lessee.
9. We, IDBI Bank Limited (bank name), lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Regional Controller of Mines, Indian Bureau of Mines Bhubaneswar in writing.
10. Notwithstanding anything contained herein:
- Our liability under this Bank guarantee shall not exceed Rs. 2,00,000/- (Rs. Two Lakh only).
 - The bank guarantee shall be valid up to 05.04.2018.
 - The period of bank guarantee submitted is valid for the period of the proposals given in the mining plan/ Scheme of mining/ PMCP etc. We are liable to pay the guarantee amount or any part thereof under this Bank guarantee and only if served upon us a written claim or demand on or before.
11. If the bank guarantee is to be en-cashed through the court, in that case the (city where Regional office, IBM is located) court will have jurisdiction.

अधीनस्थ अधिकारी/अधीनस्थ अधिकारी
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अधीनस्थ अधिकारी/अधीनस्थ अधिकारी

CHANDRA MOH DAS
RQP/BBB/552/2004/A

ସାଧନ ବିଭାଗ
ସାଧନ ମନ୍ତ୍ରାଳୟ
ସାପ୍ତାହିକ ସାଧନ ଖଣି
କୌଣସି ସାଧନ ନିର୍ଦ୍ଦେଶ କିମ୍ବା ସାପ୍ତାହିକ

No. MS/OTFM/15-ORE/BHIL/2013-14

ସାପ୍ତାହିକ ସାଧନ, ପୂର୍ବୀ ଶିଳ୍ପ
308, ଲିଫ୍ଟିଂ ଶିଳ୍ପ, ପାଟଣାପୁର
ପୁରୀ-751004
दिना/Date: 24.01.2014

To

✓ Sri Sayad Abdul Halim, Mine Owner
2271, Room No.21/22, 3rd Floor
Biswal Commercial Complex
Cuttack Road, Bhubaneswar-6

Sub: Approval of Scheme of Mining of Oraghat Iron & Manganese Mine along with Progressive Mine Closure Plan (PMCP), over an area of 25.847 ha, in Sundargarh district of Odisha state, submitted by Sri Sayad Abdul Halim under Rule 12 of MCDR, 1988.

Ref: (i) Your letter No. Nil dated 04.09.2013,
(ii) This office letter of even no dated 05.09.2013 & 04.10.2013 .
(iii) Your letter No. Nil dated 02.12.2013
(iv) This office letter of even no dated 16.01.2014.
(v) Your letter No. Nil dated 20.01.2014

Sir,

In exercise of the power conferred by Sub-rule (4) of Rule 12 of the Mineral Conservation and Development Rules, 1988, I hereby APPROVE the above Scheme of Mining along with Progressive Mine Closure Plan (PMCP) under Rule 12 of MCDR, 1988 for the period 2013-14 to 05.04.2018.

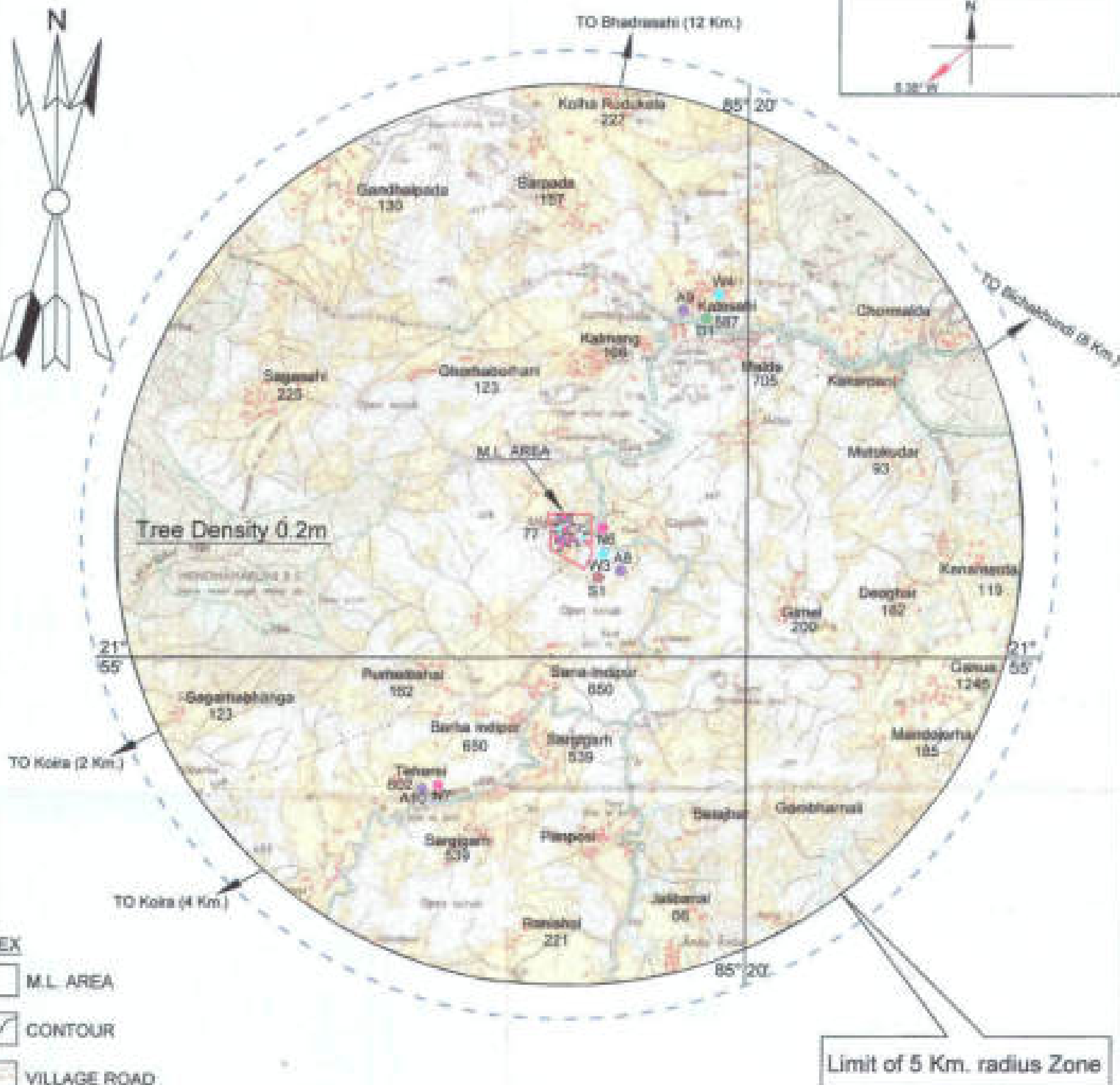
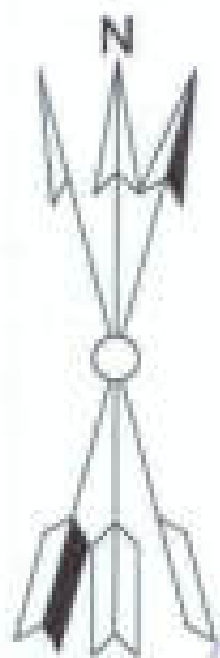
- I. This Scheme of Mining is approved without prejudice to any other law applicable to the mine area from time to time whether made by the Central Government, State Government or any other authority.
- II. It is clarified that the approval of aforesaid Scheme of Mining does not in any way imply the approval of the Government in terms of any other provision of Mines & Minerals (Development & Regulation) Act, 1957, or the Mineral Concession Rules, 1960 and any other laws including Forest (Conservation) Act, 1980, Environment (Protection) Act, 1986, or the rules made there under.
- III. It is clarified that this approval is subject to the provisions of Forest (Conservation) Act, 1980, Forest (Conservation) Rules, 2003 and other relevant statutes, orders and guidelines as may be applicable to the lease area from time to time.
- IV. It is further clarified that this approval is subject to the Provisions of the Mines Act, 1952 and Rule & Regulations made there under including submission of notice of opening, appointment of manager and other statutory officials as required under the Mines Act, 1952.
- V. The execution of the Scheme of Mining shall be subjected to vacation of prohibitory orders/ notices, if any.
- VI. This approval for mining operations and associated activities is restricted to the mining lease area only and also within the diverted area by the competent authorities of forest department till the requisite permission is granted by such authorities in additional areas as proposed in the document. The mining lease area is as shown on the statutory plans under Rule 28 of Mineral Conservation and Development Rules 1988, by the Lessee/ RQP/ Applicant, and Indian Bureau of mines has not undertaken verification of the mining lease boundary on the ground.

Copy for kind information to:

1. Shri Chandrabhanu Das, RQP, Geo Consultants (P) Ltd, 853, Govind Prasad (Medical lane), Mahavir Nagar, Laxmisagar Bhubaneswar 751 006,
2. The Director of Mines Safety, Directorate General of Mines Safety, Chaibasa Region, At & Post Chaibasa, District – Singhbhum West along with one copy of the approved Scheme of Mining by REGISTERED PARCEL.
3. The Director of Mines, Directorate of Mines, Government of Odisha, Heads of the Department Building, New Capital, Bhubaneswar- 751 001 Odisha along with one copy of approved scheme of mining by REGISTERED PARCEL.

(M BESWAS)

ଶ୍ରୀ ରମେଶ୍ୱର / Regional controller of Mines



(DATE OF SURVEY - 21.12.2012)

PLATE-I

ORAGHAT IRON & MANGANESE MINE OVER 25.847 HECT. IN SUNDARGARH DISTRICT, ODISHA.

KEY PLAN

(Showing all features within 5 km radius zone)

Ref. TOPOSHEET No. 73 G/5

Scale 1: 50,000

IT IS HEREBY CERTIFIED THAT THE PLANS & SECTIONS ARE
PREPARED BASED ON THE LEASE MAP AUTHENTICATED BY
STATE GOVERNMENT.

LESSEE

CHANDRABHANU DAS
RQP/886/052/2004/A

S.A. HALIM

PLAN SHOWING THE M L AREA GRANTED IN FAVOUR OF S A HALIM FOR
IRON & MANGANESE ORE IN VILLAGE ORAGHAT IN BONAI SUBDIVISION OF
SUNDAR GARH DISTRICT OVER 25.847 HECTARES OR 63.87
ACRES.

SCALE - 16-1 MILE



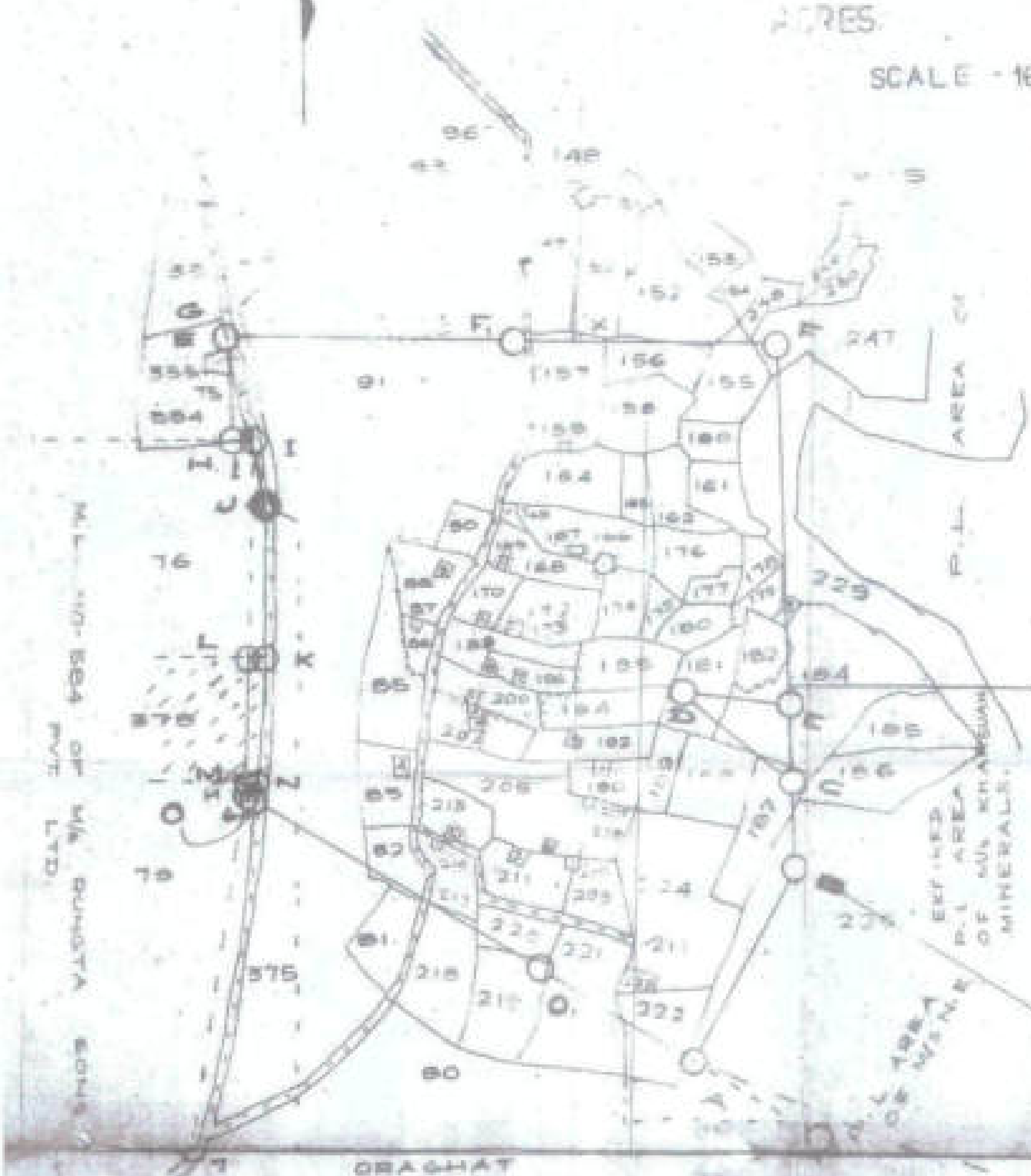
CHANDRABHANU DAS
ROR/BS/052/004A

FIELD NOTE

STATION	BEARING	INTERIOR ANGLES	DISTANCE		REMARKS
			FEET	METRES	
A	29° 00'	88° 00'	645	196.596	COMMON WITH M.L.E
B		150° 00'	250	76.200	COMMON WITH M.L.E
C		131° 00'	450	137.064	COMMON WITH M.L.E
D		327° 15'	325	99.060	
E		81° 00'	1055	321.564	EX COMMON WITH P.L. AREA OF S.A. HALIM
F		53° 00'	785	239.268	
G		180° 00'	865	263.682	
H		26° 00'	515	156.012	
I		93° 00'	65	19.812	HI. COMMON WITH M.L. AREA OF S.A. HALIM
J		258° 00'	150	45.712	
K		192° 00'	450	137.160	
L		271° 00'	50	15.240	
M		30° 00'	350	106.624	L.M. COMMON WITH M.L. AREA OF S.A. HALIM
N		91° 45'	50	15.244	
O		273° 30'	40	12.192	
P		114° 30'	1000	304.800	COMMON WITH M.L. AREA OF S.A. HALIM
Q		180° 00'	550	167.640	COMMON WITH M.L. AREA OF S.A. HALIM

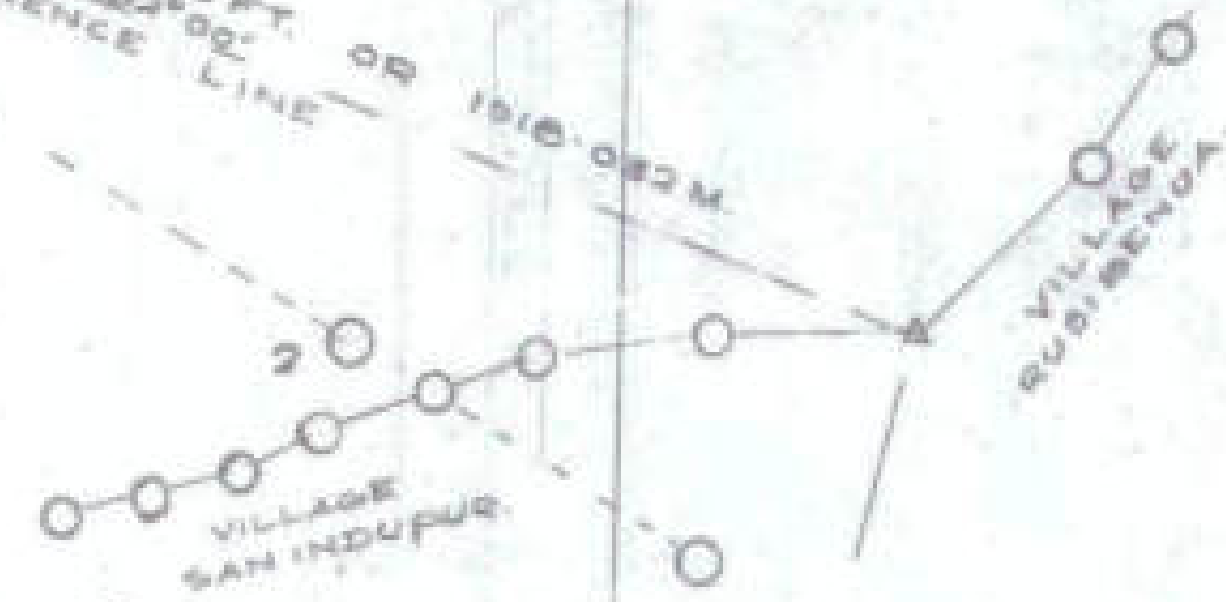


KEY PLAN
T.S. NO 73 G/5 SCALE-1:50000



TAMJILAN
BONAI

DIST. 3540 FT. OR 1082 M
F.S. 282° 00'
REFERENCE LINE
M.L. NO. 583
M.L. RONGTA SONS
PVT. LTD.



SURVEYED & DRAWN BY
[Signature]
SR SURVEYOR
MINING CIRCLE OFFICE
KODA

CHECKED BY
[Signature]
MINING OFFICER
KODA

DY DIRECTOR
KODA
MINES

LESSEE
[Signature]
26/12/97

COLLECTOR



INDEX

TOPOGRAPHICAL FEATURES

- BOUNDARY OF M.L. AREA
- CONTOUR
- EXISTING QUARRY
- EXISTING DUMP
- EXISTING MINERAL STACK YARD
- VILLAGE ROAD
- MINES ROAD
- ULTIMATE PIT LIMIT
- SAFETY ZONE
- NALA
- DRILLED BOREHOLE
- SCREENING / OFFICE / SCHOOL/S
- INHABITED SITE
- MAIN POWER LINE
- SPOT LEVEL
- BENCH MARK
- SETTLING POND

EXISTING LAND TYPE

- DLC FOREST
- NF NON- FOREST
- GOVERNMENT LAND
- PRIVATE LAND
- SURFACE RIGHT AREA

COO-RDINATES OF BOUNDARY PILLARS

SL.NO	PL-NO	LONGITUDE			LATITUDE		
		DEGREE	MINUTE	SECOND	DEGREE	MINUTE	SECOND
1	A	85°	18'	44.47728"	21°	55'	38.20512"
2	B	85°	18'	46.35520"	21°	55'	43.65624"
3	C	85°	18'	48.32316"	21°	55'	48.09308"
4	D	85°	18'	44.51472"	21°	55'	48.20808"
5	E	85°	18'	48.28772"	21°	55'	48.39924"
6	F	85°	18'	47.81160"	21°	55'	57.70020"
7	F1	85°	18'	38.88360"	21°	55'	58.57932"
8	G	85°	18'	29.81198"	21°	55'	58.43460"
9	H	85°	18'	30.04688"	21°	55'	55.27560"
10	I	85°	18'	30.86398"	21°	55'	55.27812"
11	J	85°	18'	31.05468"	21°	55'	53.16188"
12	K	85°	18'	30.62124"	21°	55'	49.59948"
13	L	85°	18'	30.12768"	21°	55'	48.50732"
14	M	85°	18'	29.74680"	21°	55'	45.55056"
15	N	85°	18'	30.02904"	21°	55'	45.42132"
16	O	85°	18'	29.90916"	21°	55'	45.07068"
17	O1	85°	18'	38.76588"	21°	55'	40.61172"



(DATE OF SURVEY - 21.12.2012) PLATE-III

ORAGHAT IRON & MANGANESE MINE
OVER 25.847 HECT.
IN SUNDARGARH DISTRICT, ODISHA.

SURFACE PLAN

R.F. 1:1,000

IT IS HEREBY CERTIFIED THAT THE PLANS & SECTIONS ARE
PREPARED BASED ON THE LEASE MAP AUTHENTICATED BY
STATE GOVERNMENT.

LESSEE

CHANDRABHANU DAS
RQP/883/052/2004/A

S.A. HALIM

INDEX

TOPOGRAPHICAL FEATURES

- BOUNDARY OF M.L. AREA
- CONTOUR
- EXISTING QUARRY
- EXISTING DUMP
- EXISTING MINERAL STACK YARD
- VILLAGE ROAD
- MINES ROAD
- ULTIMATE PIT LIMIT
- SAFETY ZONE
- NALA
- DRILLED BOREHOLE
- SCREENING / OFFICE / SCHOOL'S
- MAIN POWER LINE
- SPOT LEVEL
- MINING BLOCK
- DLC FOREST

GEOLOGICAL FEATURES

- LATERITE / LATERITIC SOIL
- Fe Fe IRON ORE
- Mn Mn MANGANESE ORE
- INTERPRETED ORE BOUNDARY
- DIP & STRIKE

PROPOSED EXPLORATION SCHEME

FINANCIAL YEAR	BORE HOLES (CORING)	REMARKS	SHOWN IN COLOR
2014 - 2015	PBH - n	PBH-1 to 9	
2015 - 2016	PBH - n	PBH-10 to 19	

REFERENCE

- PROVED MINEABLE RESERVE ZONE
- PROBABLE - MINEABLE RESERVE ZONE

UNFC CODE

- Q1
- Q1



(DATE OF SURVEY - 21.12.2012)

PLATE-IV

ORAGHAT IRON & MANGANESE MINE
OVER 25.847 HECT.
IN SUNDARGARH DISTRICT, ODISHA.

GEOLOGICAL PLAN

R.F. 1:1,000

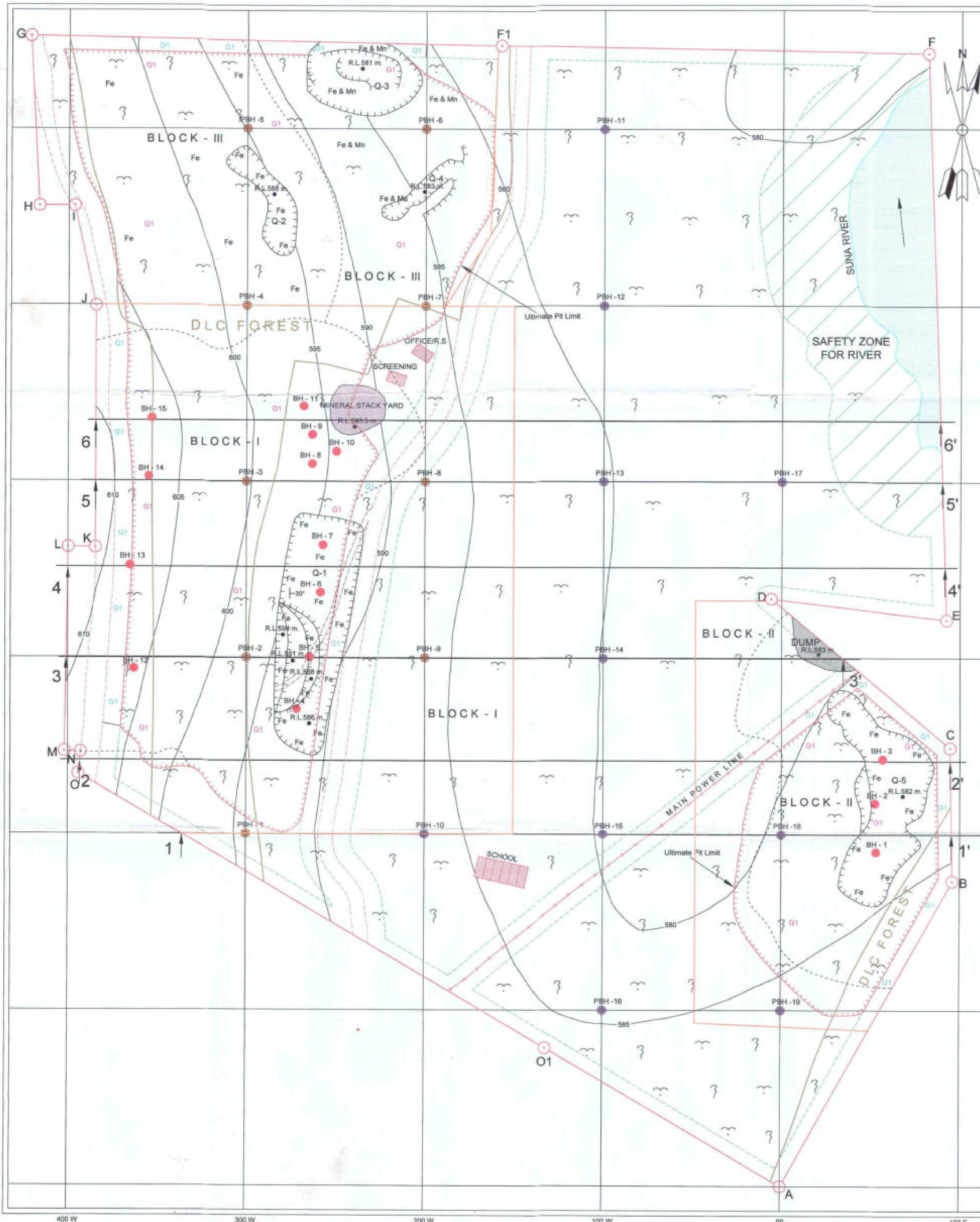


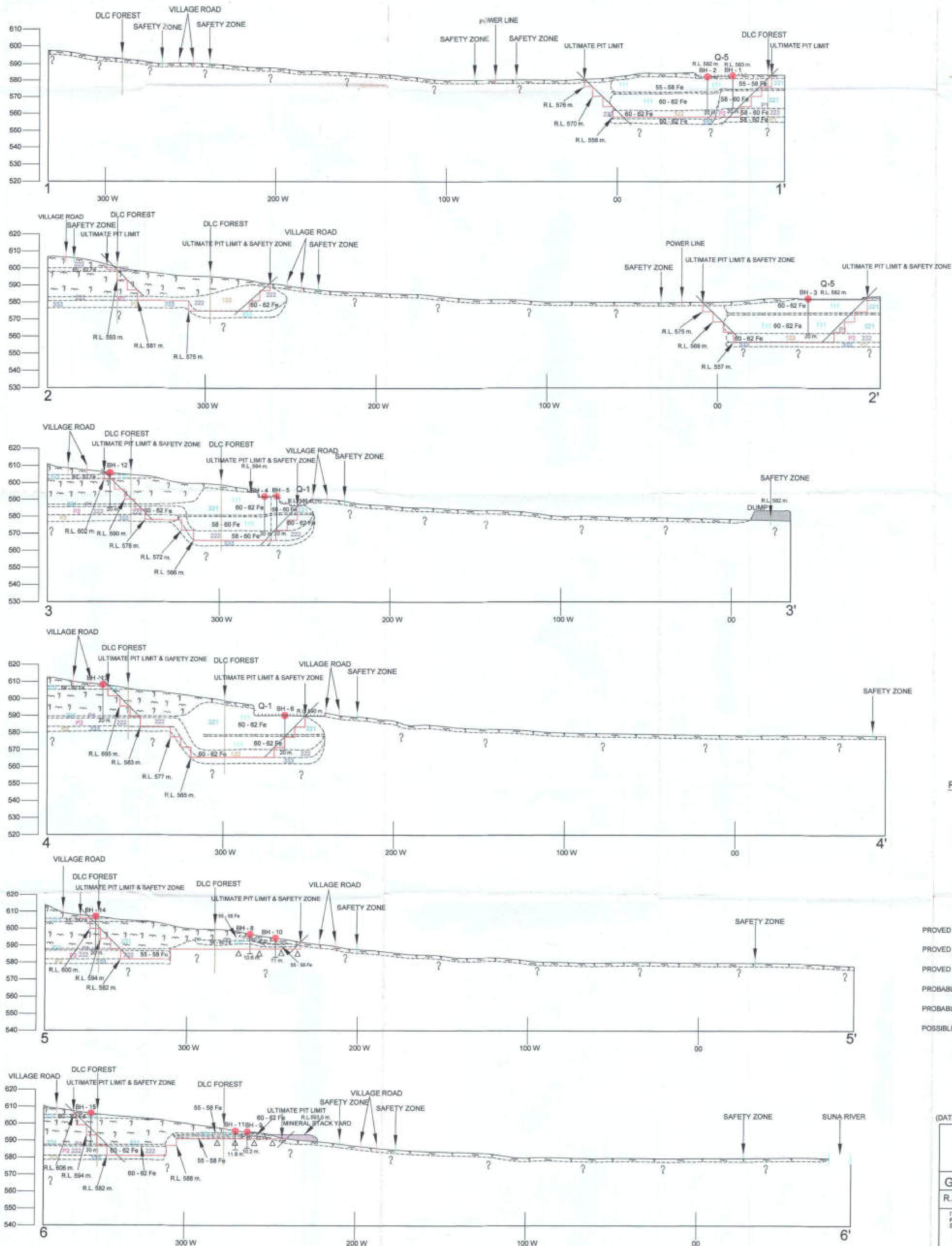
IT IS HEREBY CERTIFIED THAT THE PLANS & SECTIONS ARE PREPARED BASED ON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT.

LESSEE

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BQP/BB5052/2004/A

S.A. HALIM





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	LATERITE / LATERITIC SOIL
	FERRUGINOUS SHALE
	IRON ORE
	MANGANESE ORE
	B.H.Q.
	INTERPRETED ORE BOUNDARY
	EXISTING QUARRY
	DRILLED BOREHOLE
	NALA
	VILLAGE ROAD
	SAFETY ZONE
	DLC FOREST
	ULTIMATE PIT LIMIT AT THE END OF ENTIRE LIFE OF THE MINE DUE TO PIT SLOPE (45°)
	EXISTING MINERAL STACK YARD
	SPOT LEVEL

RESERVE CATEGORY

	PROVED RESERVE ZONE
	PROBABLE RESERVE ZONE
	POSSIBLE RESERVE ZONE

REFERENCE

PROVED NON-FOREST MINEABLE RESERVE ZONE	111
PROVED NON - MINEABLE RESERVE ZONE	221
PROVED NON-FOREST MINEABLE RESERVE ZONE	122
PROBABLE MINEABLE RESERVE ZONE	102
PROBABLE NON - MINEABLE RESERVE ZONE	222
POSSIBLE RESERVE ZONE	333

UNFC CODE

111
221
122
102
222
333



(DATE OF SURVEY - 21.12.2012)

PLATE-IV(A)

ORAGHAT IRON & MANGANESE MINE
OVER 25.847 HECT.
IN SUNDARGARH DISTRICT, ODISHA.

GEOLOGICAL SECTIONS(Ref.Plate No . IV)

R.F.1:1,000

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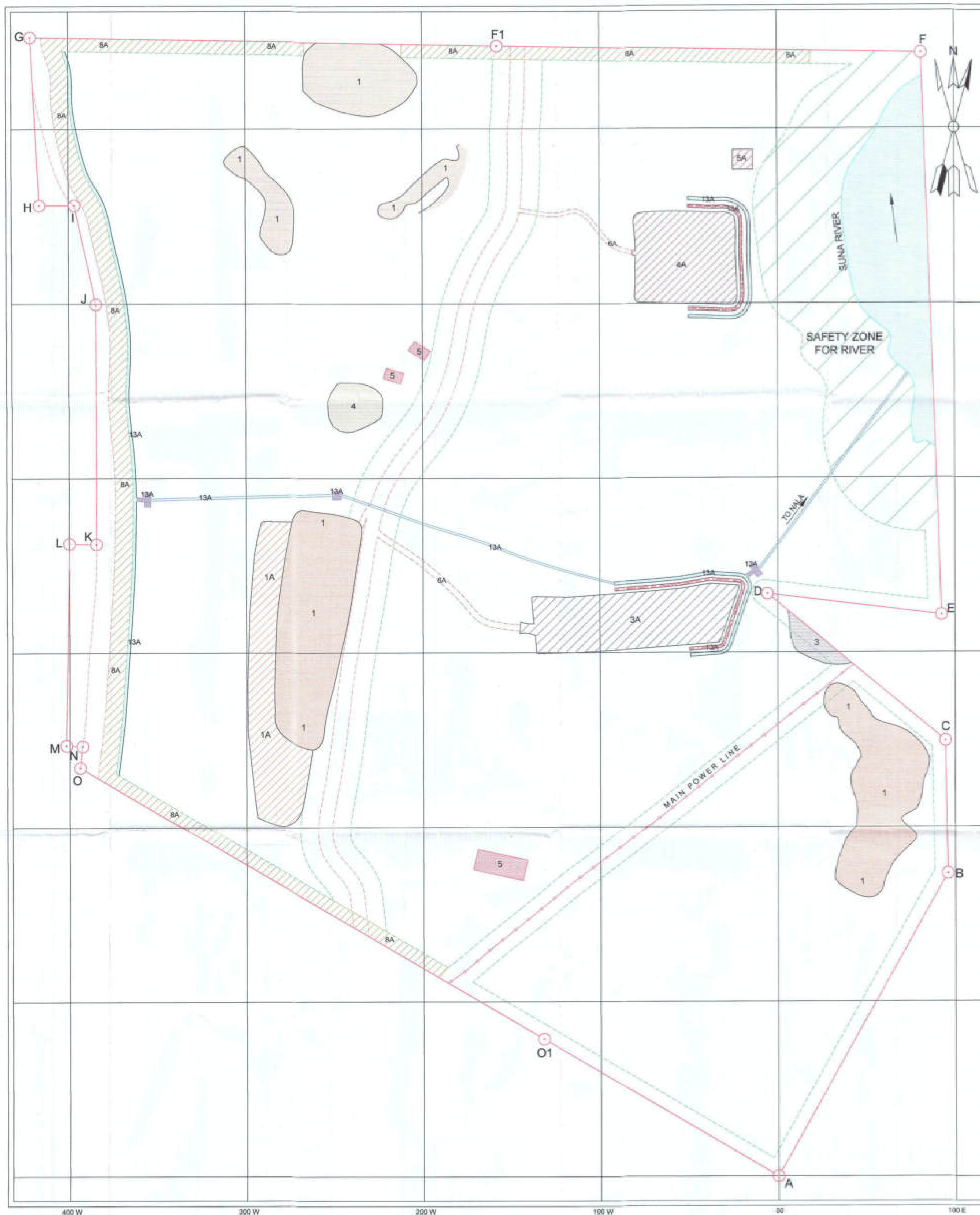


TABLE FOR CALCULATION OF FINANCIAL ASSURANCE
(As per CCOM's Circular No. 04 / 2008)

Sl. No	Type of land use	As at present (Ha.)	During the Scheme Period (Ha.)	Total (Ha.)	The area considered as fully reclaimed and rehabilitated	Not considered for calculation of financial assurance
		A	B	C=A+B	D	E=C-D
1	Area of excavation	1.47	0.32	1.79	0.0	1.79
2	Storage for top-soil	0.0	0.0	0.0	0.0	0.0
3	Waste dump	0.135	0.391	0.526	0.0	0.526
4	Mineral storage	0.103	0.382	0.545	0.0	0.545
5	Infrastructure (shed, Sheds, Pumping station, Magazine, Office etc.)	0.011	0.037	0.048	0.0	0.048
6	Roads	0.785	0.110	0.895	0.0	0.895
7	Railways	0.0	0.0	0.0	0.0	0.0
8	Green Belt	0.0	1.046	1.046	0.0	1.046
9	Filling Pond	0.0	0.0	0.0	0.0	0.0
10	Effluent Treatment Plant	0.0	0.0	0.0	0.0	0.0
11	Mineral Separation plant	0.0	0.0	0.0	0.0	0.0
12	Township Area	0.0	0.0	0.0	0.0	0.0
13	Others specify (Sub-grade stack)	0.0	0.00	1.2	0.0	1.2
	Total	2.505	2.486	5.051	0.0	5.051

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- BOUNDARY OF M.L. AREA
- EXISTING QUARRY
- POSITION OF WORKING BENCHES AT THE END OF 2013-2018
- EXISTING DUMP
- PROPOSED DUMP 2013-18
- EXISTING MINERAL STACK
- PROPOSED MINERAL STACK
- EXISTING INFRASTRUCTURE
- PROPOSED INFRASTRUCTURE
- PROPOSED ROAD
- TREE PLANTATION
- RETAINING WALL
- GARLAND DRAIN
- SETTLING TANK
- NALA
- POWER LINE
- VILLAGE ROAD
- WATER PIPE LINE



(DATE OF SURVEY - 21.12.2012)

PLATE-IX

ORAGHAT IRON & MANGANESE MINE
OVER 25.847 HECT.
IN SUNDARGARH DISTRICT, ODISHA.

FINANCIAL ASSURANCE PLAN

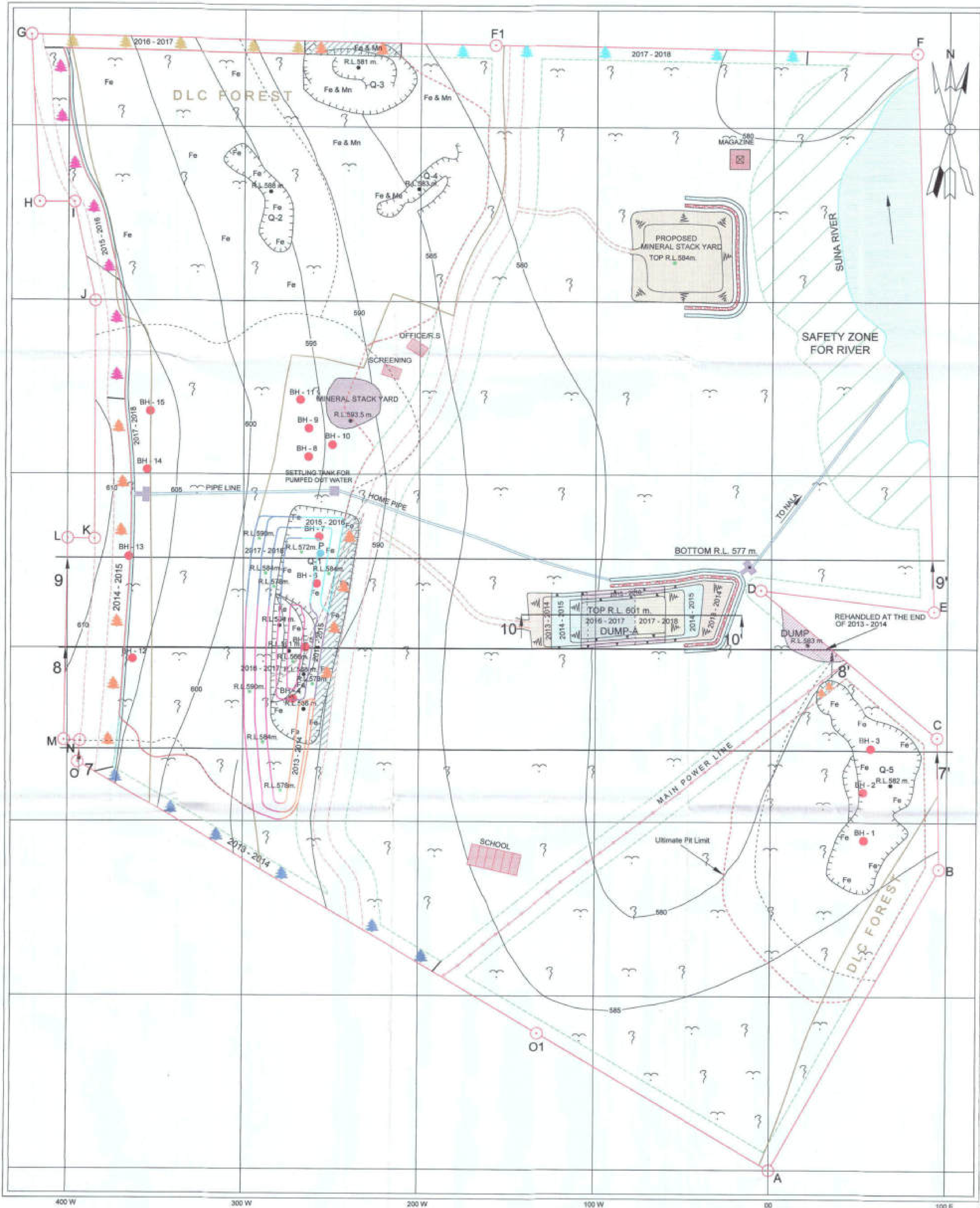
R.F. 1:1,000

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PREPARED BASED ON THE LEASE MAP AUTHENTICATED BY
STATE GOVERNMENT.

LESSEE

CHANDRABHANU DAS
RGP/BS/052/2004/A

S.A. HALIM



- ### INDEX
- #### TOPOGRAPHICAL FEATURES
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 - MINES ROAD
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 - SAFETY ZONE
 - NALA
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 - SCREENING / OFFICE / SCHOOL R.S.
 - MAIN POWER LINE
 - SPOT LEVEL
 - DLC FOREST

- #### GEOLOGICAL FEATURES
- LATERITE / LATERITIC SOIL
 - IRON ORE
 - MANGANESE ORE
 - INTERPRETED ORE BOUNDARY

- #### PROPOSED FEATURES
- POSITION OF WORKING BENCHES AT THE END OF
- 2013 - 2014
 - 2014 - 2015
 - 2015 - 2016
 - 2016 - 2017
 - 2017 - 2018
 - PROPOSED MINES ROAD
 - PROPOSED MINERAL STACK YARD
 - RETAINING WALL
 - GARLAND DRAIN
 - SETTLING TANK
 - MAGAZINE
 - PUMPING STATION
 - WATER PIPE LINE
 - PROPOSED REDUCED LEVEL

- #### YEARWISE PLANTATION
- 2013 - 2014
 - 2014 - 2015 (SAFETY ZONE & BACKFILLED AREA)
 - 2015 - 2016
 - 2016 - 2017
 - 2017 - 2018

- #### YEARWISE DUMP
- 2013 - 2014
 - 2014 - 2015
 - 2015 - 2016
 - 2016 - 2017
 - 2017 - 2018
- #### BACKFILLED & REHABILITATED AREA
- 2013 - 2014
 - 2014 - 2015
- REHANDLED AT THE END OF (2013 - 2014)
- DUMP (2013 - 2014)

(DATE OF SURVEY - 21.12.2012) PLATE-V

**ORAGHAT IRON & MANGANESE MINE
OVER 25.847 HECT.
IN SUNDARGARH DISTRICT, ODISHA.**

**COMPOSITE DEVELOPMENT PLAN WITH
PROPOSED DUMP PLAN**

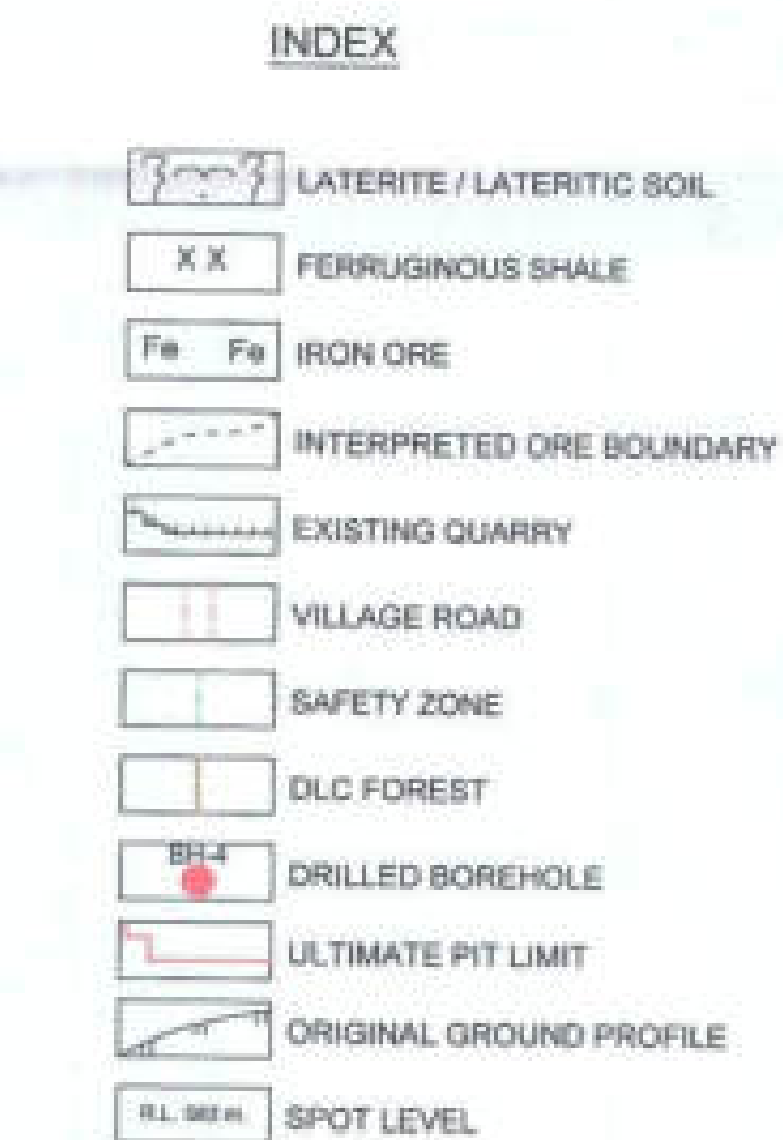
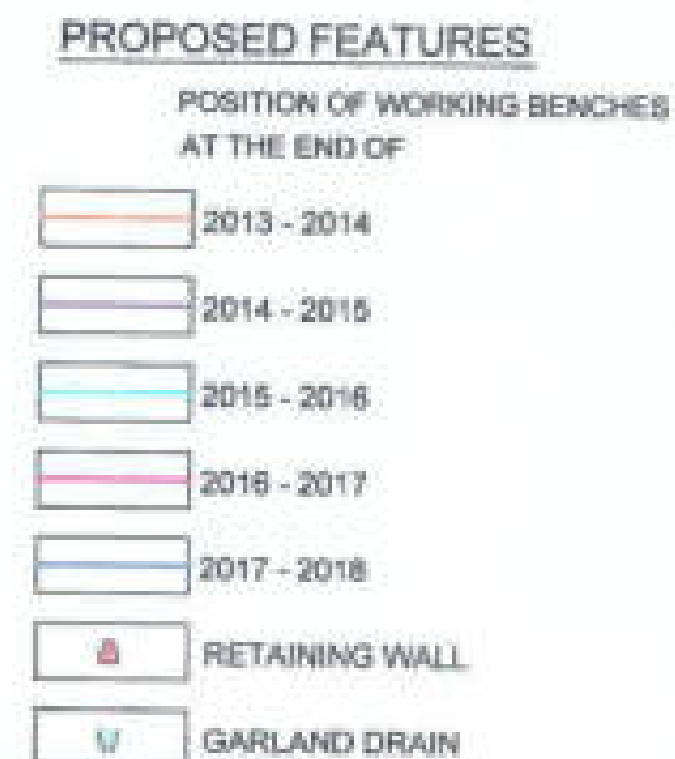
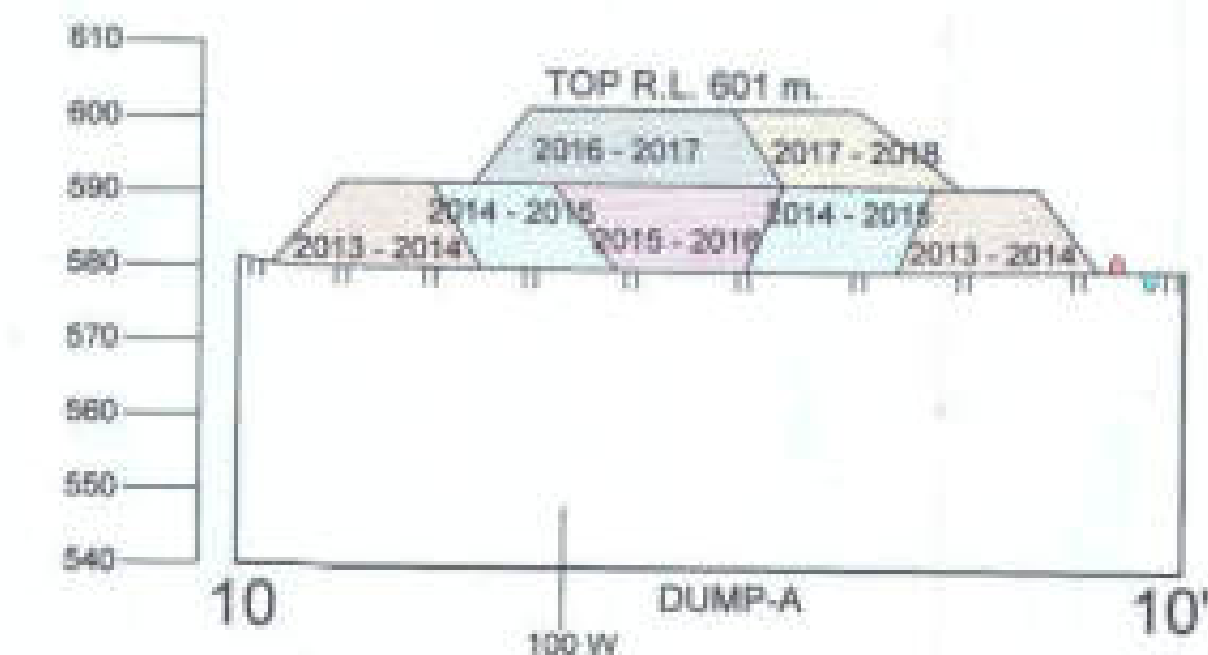
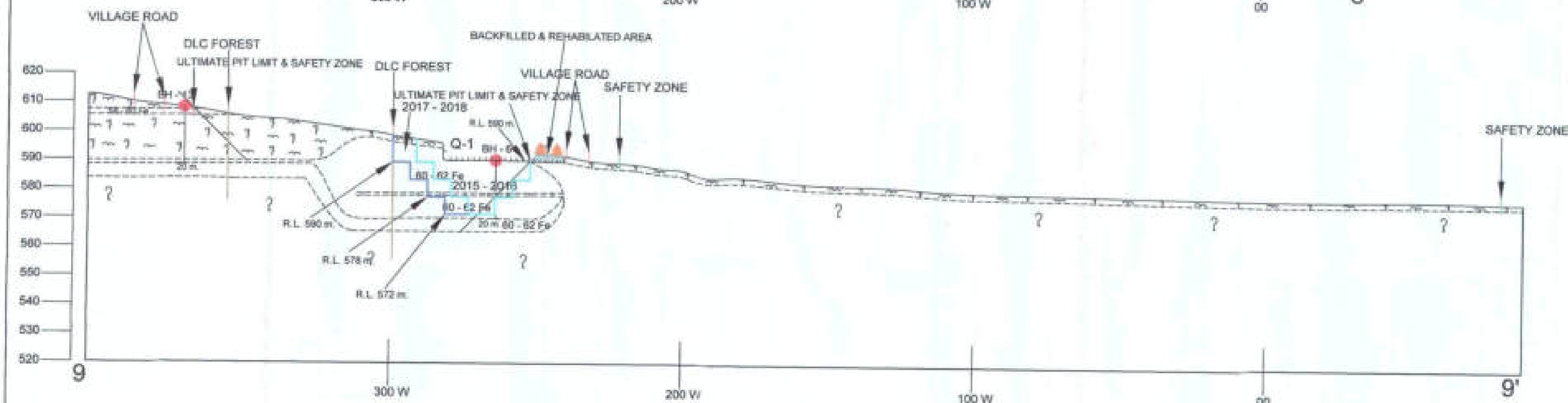
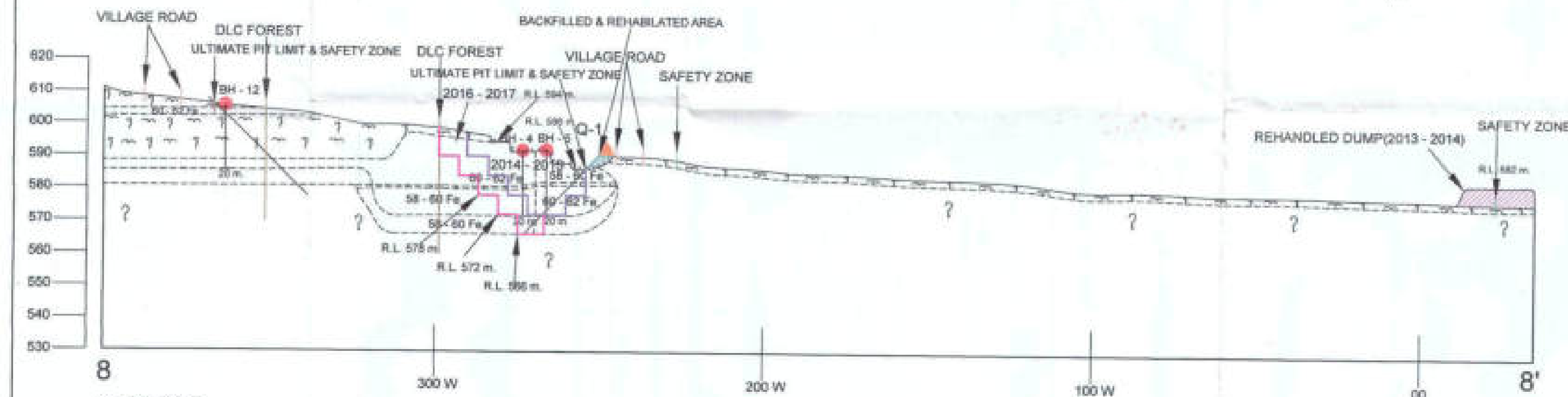
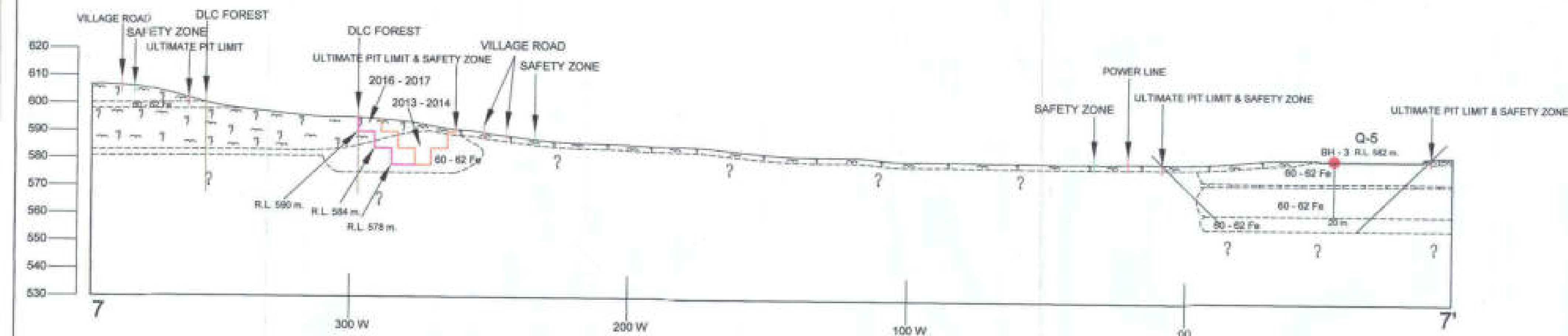
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CHANDRABHANU DAS
RQ/MS/052/2004/A

S.A. HALIM



REHANDLED AT THE END OF (2013 - 2014)

DUMP (2013 - 2014)



(DATE OF SURVEY - 21.12.2012)

PLATE-V(A)

ORAGHAT IRON & MANGANESE MINE
OVER 25.847 HECT.
IN SUNDARGARH DISTRICT, ODISHA.

COMPOSITE DEVELOPMENT SECTIONS
WITH PROPOSED DUMP SECTION

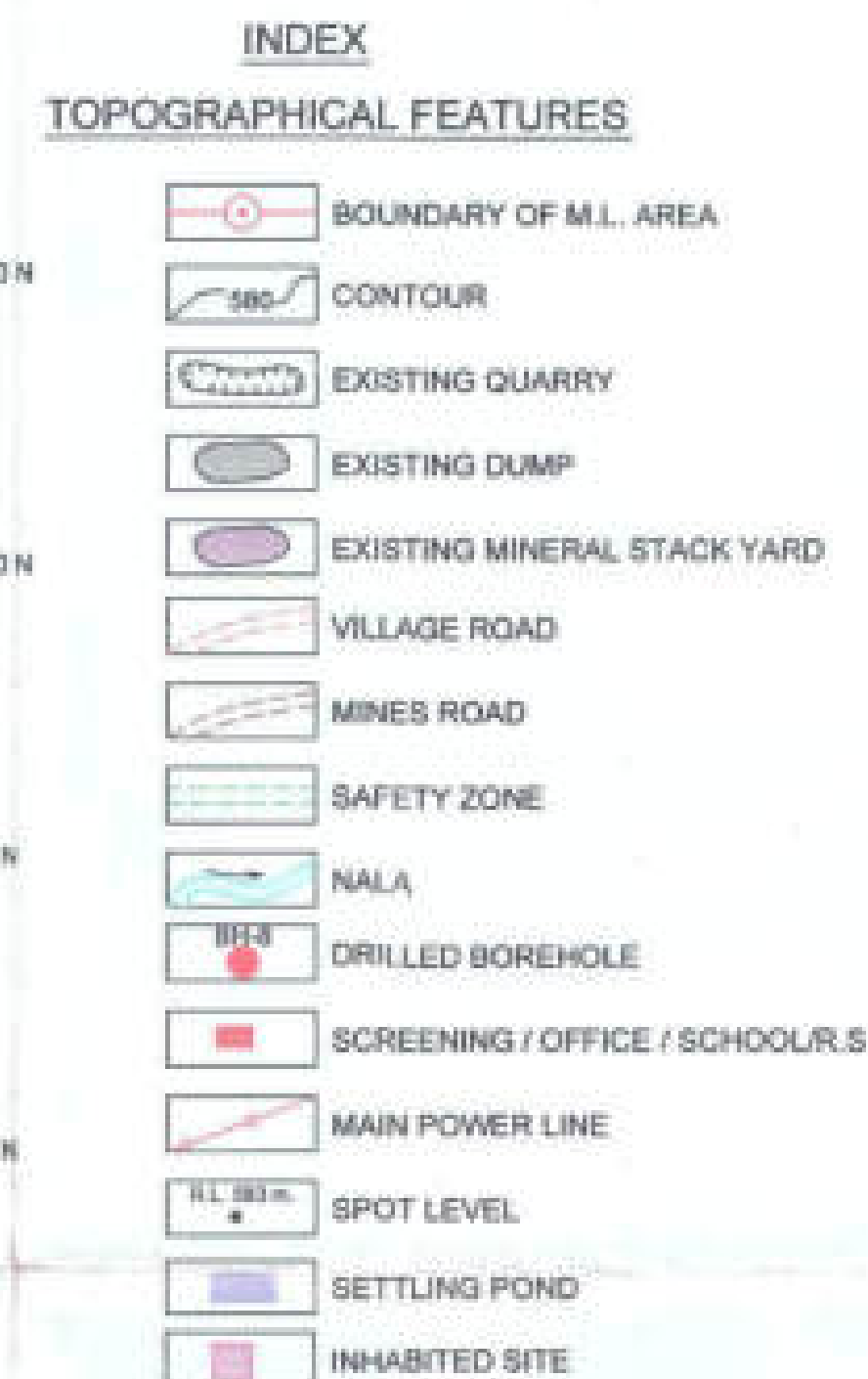
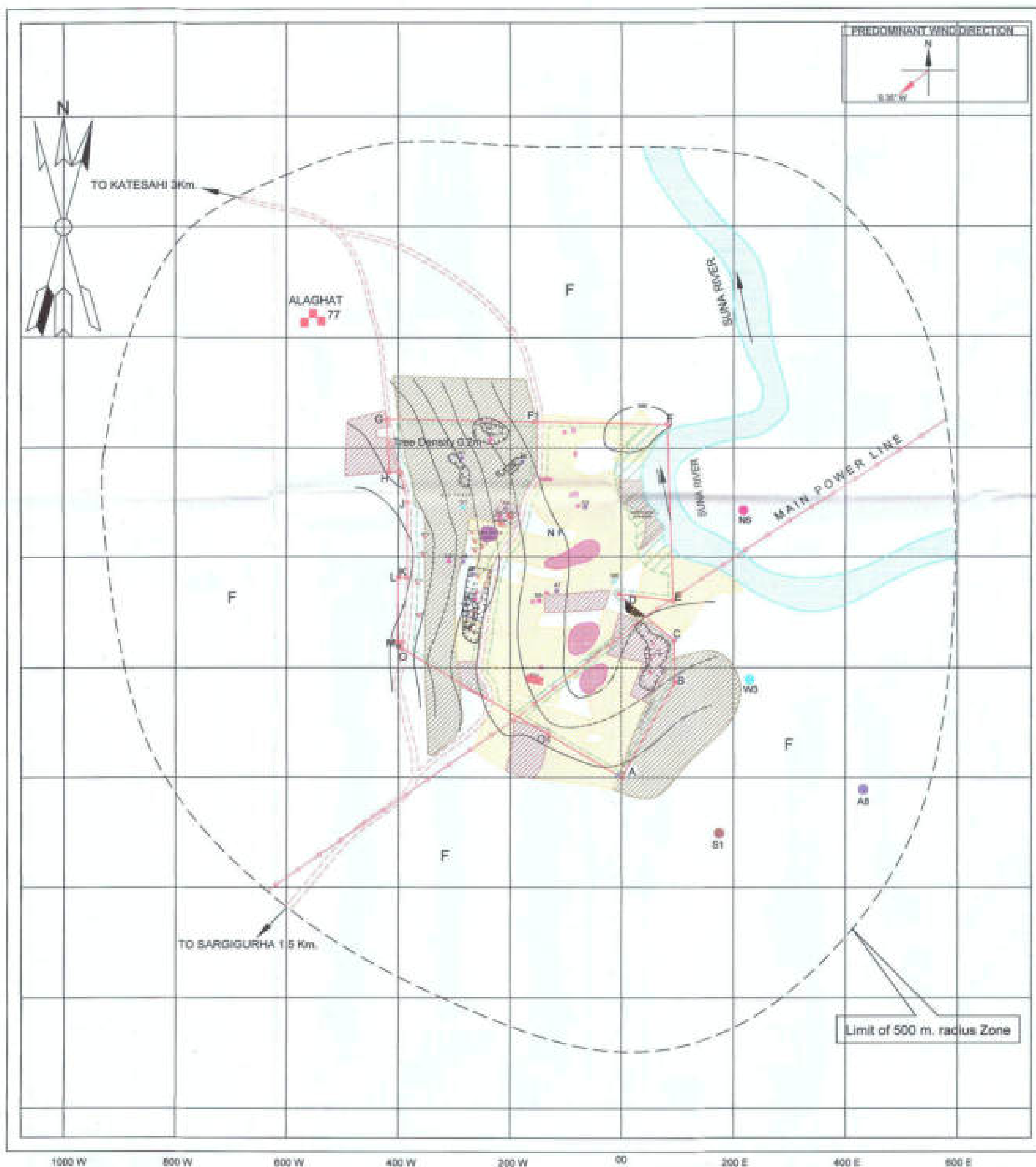
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RGP/BBSD/052/2004/A

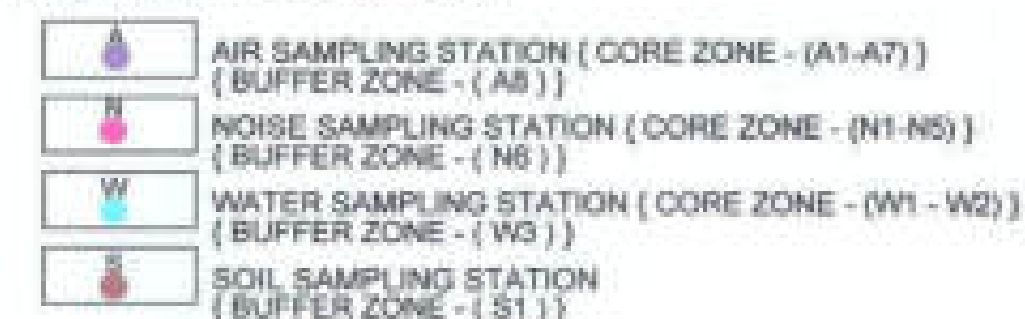
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EXISTING LAND TYPE



MONITORING STATION



(DATE OF SURVEY - 21 . 12 . 2012)

PLATE-VI

**ORAGHAT IRON & MANGANESE MINE
OVER 25.847 HECT.
IN SUNDARGARH DISTRICT, ODISHA.**

ENVIRONMENT PLAN

R.F. 1:5,000



IT IS HEREBY CERTIFIED THAT THE PLANS & SECTIONS ARE
PREPARED BASED ON THE LEASE MAP AUTHENTICATED BY
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CHANDRABHANU DAS
RQP/BSR/052/2004/A

S.A. HALIM

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- MINES ROAD
- ULTIMATE PIT LIMIT
- SAFETY ZONE
- NALA
- DRILLED BOREHOLE
- SCREENING / OFFICE / SCHOOL/R.S.
- MAIN POWER LINE
- SPOT LEVEL
- INHABITED SITE
- SETTLING POND

PROPOSED FEATURES

POSITION OF WORKING BENCHES AT THE END OF

- POSITION OF WORKING BENCHES AT THE END OF 2013 - 14 TO 2017 - 2018
- PROPOSED MINES ROAD
- PROPOSED MINERAL STACK YARD
- RETAINING WALL
- GARLAND DRAIN
- SETTling TANK
- MAGAZINE
- PUMPING STATION
- AIR SAMPLING STATION (CORE ZONE - (A1 - A7))
- NOISE SAMPLING STATION (CORE ZONE - (N1 - N5))
- WATER SAMPLING STATION (CORE ZONE - (W1 - W2))
- WATER PIPE LINE (2017 - 2018)
- FENCING
- PROPOSED REDUCED LEVEL

EXISTING LAND TYPE

- DLC FOREST
- NON- FOREST
- GOVERNMENT LAND
- PRIVATE LAND

YEARWISE PLANTATION

- 2013 - 2014
- 2014 - 2015
- 2015 - 2016
- 2016 - 2017
- 2017 - 2018

YEARWISE DUMP

- 2013 - 2014
- 2014 - 2015
- 2015 - 2016
- 2016 - 2017
- 2017 - 2018

REHANDLED AT THE END OF (2013 - 2014)

- DUMP (2013 - 2014)

BACKFILLED & REHABILITATED AREA

- 2013 - 2014
- 2014 - 2015

(DATE OF SURVEY - 21.12.2012)

PLATE-VII

ORAGHAT IRON & MANGANESE MINE
OVER 25.847 HECT.
IN SUNDARGARH DISTRICT, ODISHA.

ENVIRONMENT MANAGEMENT PLAN

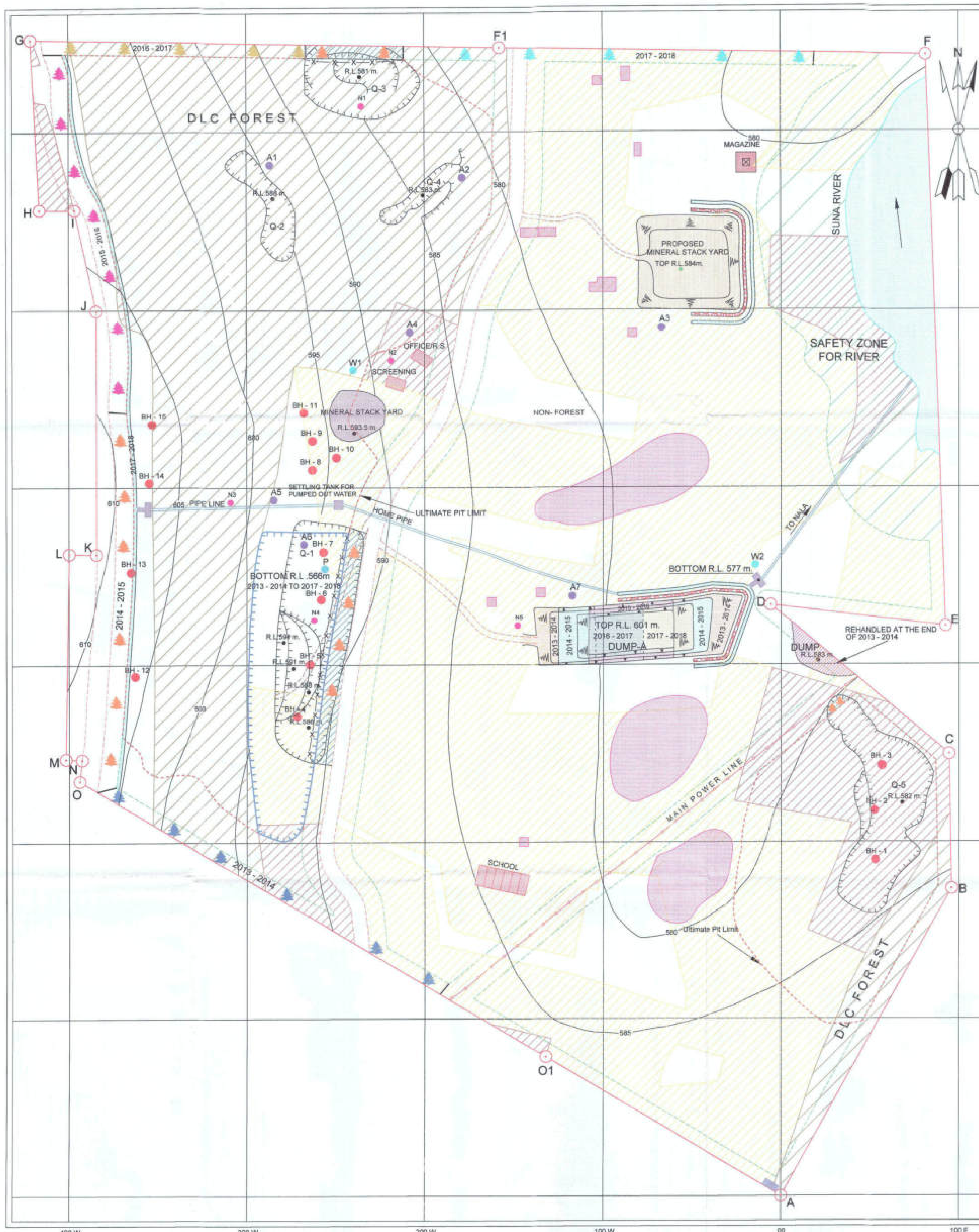
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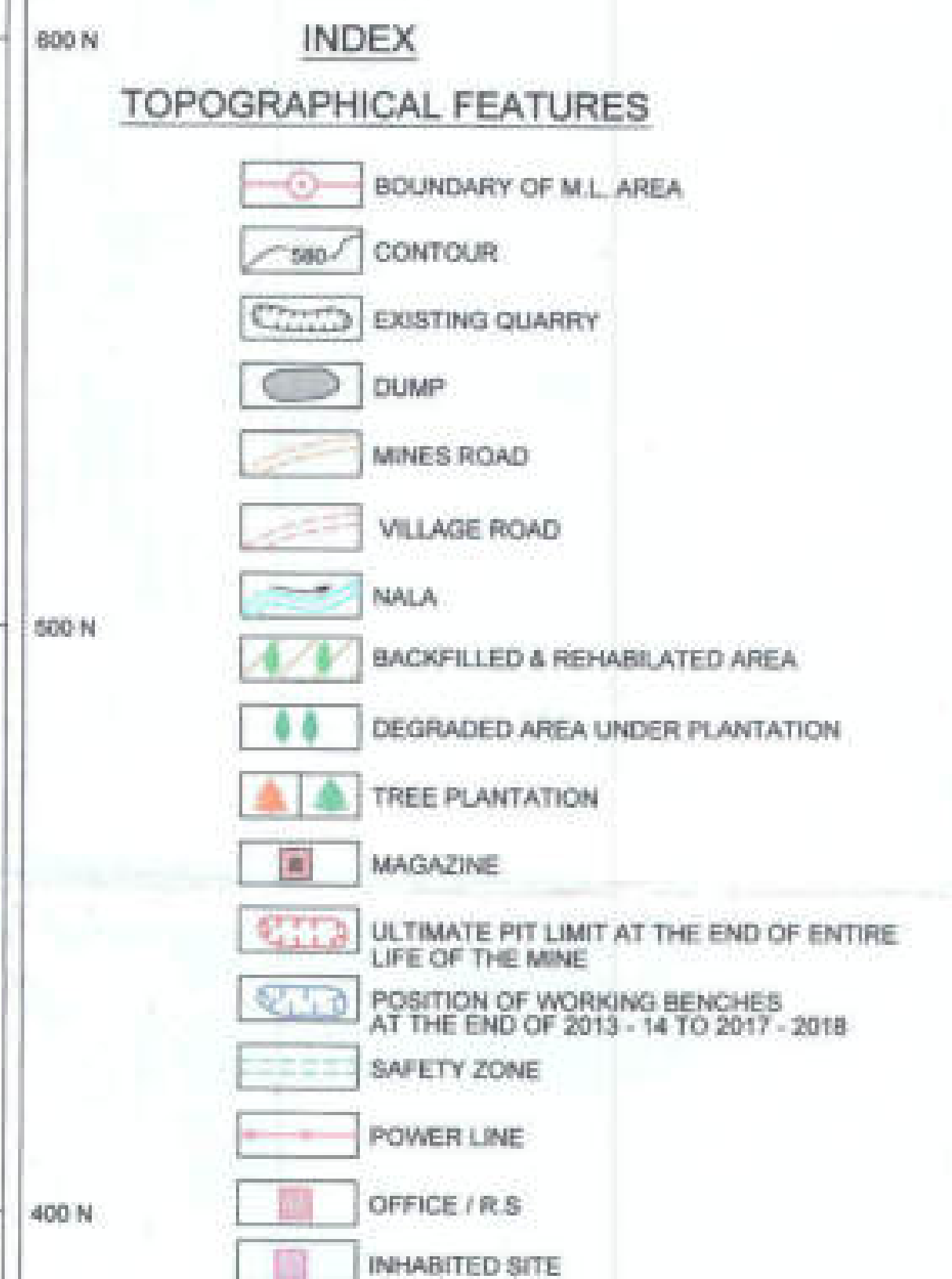
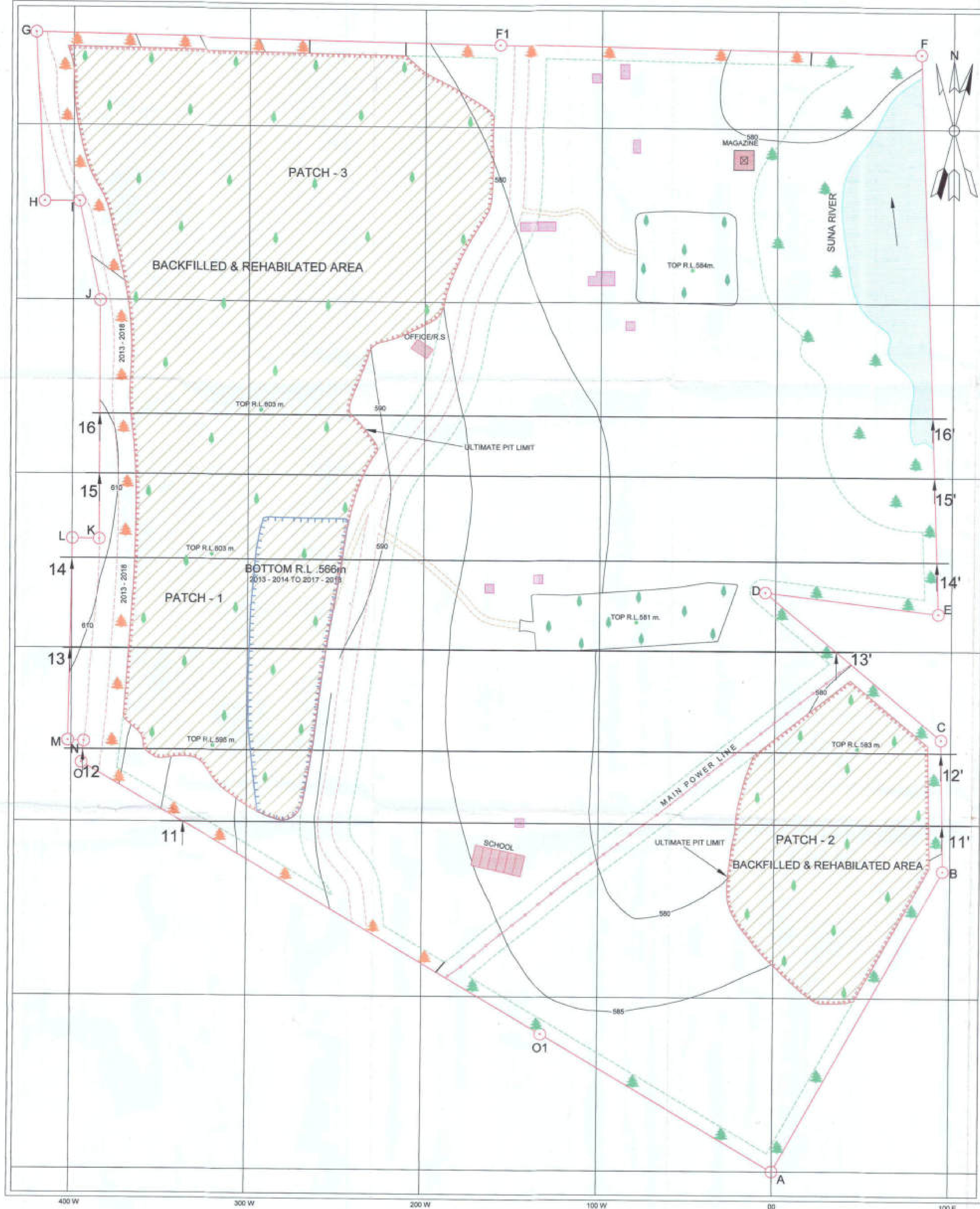
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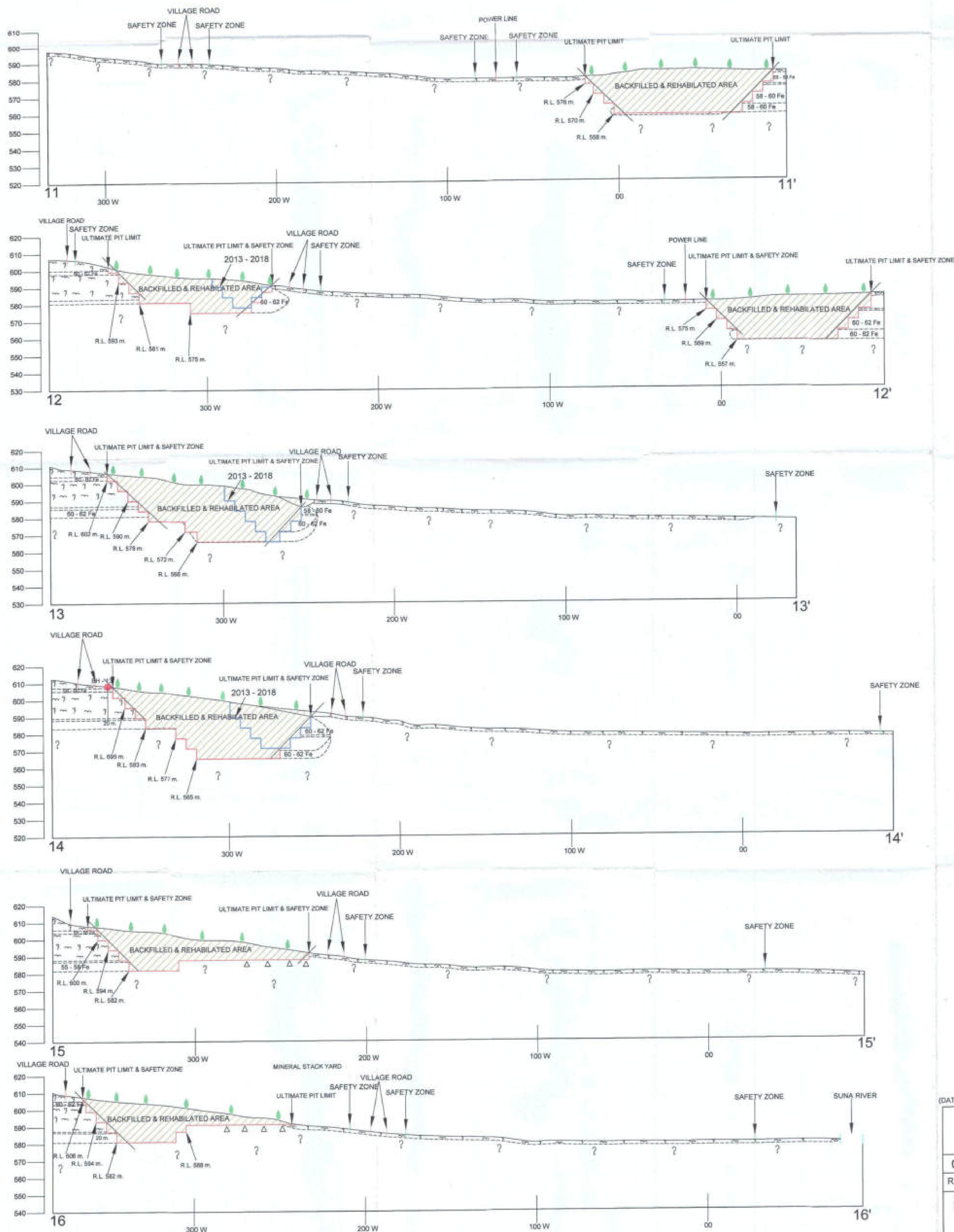
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RQP/BBG/032/2004/A

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	POSITION OF WORKING BENCHES AT THE END OF 2013-14 TO 2017-2018
	ULTIMATE PIT LIMIT AT THE END OF ENTIRE LIFE OF THE MINE DUE TO PIT SLOPE (45°)
	SPOT LEVEL



(DATE OF SURVEY - 21.12.2012)	PLATE-VIII(A)
ORAGHAT IRON & MANGANESE MINE OVER 25.847 HECT. IN SUNDARGARH DISTRICT, ODISHA.	
CONCEPTUAL SECTIONS (Ref. Plate No-VIII)	
R.F. 1:1,000	LESSEE
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