MINING PLAN

(As per Rule 24A of MCR 1960)

&

PROGRESSIVE MINE CLOSURE PLAN

(As per Rule 23 B of MCDR 1988)

अनुमोदित
APPROVED

For

Bolani Mn & Iron Ores Mine

(6.90 Sq.Miles ML in Keonjhar District, Orissa)

of

Steel Authority of India Limited
Raw Materials Division

Prepared by

DILIP KUMAR (BASU) BOSE
Regd no.: RQP/CAL/098/88/A
11/A Akshay Dutta Lane,
Calcutta -700006

Date of lease execution	-	14.11.1962
Period of lease	-	20 years from 14.11.1962
Date of expiry	-	13.11.1982
Category of mine	-	'A' Other than fully mechanised
Forest land	-	506.14 H*
Proposed period	-	20 years from Nov.2002
ML area in hectares	-	1786.74H - 200.38H* = 1586.36H
Proposed Financial year	-	1st. April 2010-31st-March 2015

* Originally 706.52 H & surrendered 200.38H balance 506.14 H

July , 2010

पत्र संख्या द्वारा
VIDE LETTER No. MP/OTF-MECH/08-ORI/BHU/2010-11

06.08.2010

Phone Nos. (0674) 2744430/ 2742[illegible]
Fax No. (0674) 2744430

भारत सरकार 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 काम्प्लेक्स, दूसरी मंजिल
308, डिस्ट्रिक सेन्टर
चंद्रशेखरपुर
भुवनेश्वर–751016

Mahani Complex, 2nd Floor
308, District Centre
Chandrasekharpur
Bhubaneswar -751016

No. MP/ OTF.MECH/08-ORI/ BHU/ 2010-11 दिनांक / Date: 06.08.2010

To

M/s Steel Authority of India limited
Raw Materials Division
Industry House, 10 Camac Street
Kolkata – 700 017

Sub: Approval of Mining Plan of Bolani Manganese & Iron Mine along with Progressive Mine Closure Plan (PMCP), over an area of 1586.36 ha, in Keonjhar district of Orissa state, submitted by M/s Steel Authority of India Limited under Rule 24A of MCR 1960.

Ref: (1) Your RQP letter No. Nil dated 17.03.2010
(2) This office letter of even number dated 11.06.2010
(3) Your RQP letter No. Nil dated 05.07.2010
(4) This office letter of even number dated 20.07.2010
(5) Your RQP letter No. Nil dated 04.08.2010

Sir,

In exercise of the power conferred by Clause (b) of Sub-Section (2) of Section 5 of Mines & Minerals (Regulation & Development) Act, 1957 read with Government of India Order No. S.O. 445 (E) dated 28.04.1987, I hereby **APPROVE** the above said mining plan. This approval is subject to the following conditions:

i) This approval of Mining Plan is 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 this approval of Mining Plan 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 and the rules made there under.

iii) It is clarified that this approval of Mining Plan is subject to the provisions of Forest (Conservation) Act, 1980, Forest (Conservation) Rules, 2003 and other relevant statues, orders and guidelines as maybe applicable to the lease area from time to time.

iv) It is further clarified that this approval of Mining Plan 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 by the Mines Act, 1952.

v) The execution of Mining Plan shall be subjected to vacations 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 mining plan 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 misrepresent facts, the approval of the document shall be revoked with immediate effect.

ix) 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.

x) This approval is given for the received proposals as applicable from this date.

xi) The Mining Plan is approved without prejudice to any order or direction from any court of competent jurisdiction.

xii) Your attention is invited to the Supreme Court interim order in W.P.(C) No.202, dated 12.12.96 for compliance. The approval of the Mining Plan is, therefore, issued without prejudice to and is subject to the said directions of the Supreme Court as applicable in your case.

xiii) Yearly report as require under Rule 23 E (2) of MCDR, 1988 setting forth the extent of protection and rehabilitation works carried out as envisaged in the approved progressive mine closure plan and if there is any deviations, reasons thereof shall be submitted before 1st July of every year to the regional Office, IBM, Bhubaneswar.

xiv) The Financial Assurance submitted on 04.08.2010 for an amount of Rs. 1,38,26,750/- (Rupees One Crore Thirty Eight Lakh Twenty Six Thousand Seven Hundred and Fifty only) is valid up to 31.03.2015. A new bank guarantee is to be submitted on or before its expiry i.e. 31.03.2015.

xv) A copy of Environment Impact Assessment – Environment management Plan (EIA-EMP) as approved by MOEF (Ministry of Environment & Forest) shall be submitted to IBM immediately after approval by MOEF.

xvi) The Environmental Monitoring Cell shall be established by the company. This Environmental Monitoring Cell of the company 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 paged 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/ 3/ MP/ 90-CCOM Vol. VII dated 06.04.2010 shall be complied within a period of six (6) months of approval of this document

भवदीय / yours faithfully,

Encl: Two copies of approved Mining Plan.

(एस. टियु/ S.TIU)

क्षेत्रीय खान नियंत्रक / Regional controller of Mines

Copy for kind information to:

1. Shri Dilip Kumar Basu (Bose), RQP, Brojo-Dham, 11/ A, Akshay Dutta Lane, Kolkata – 700 006.
2. The Director of Mines Safety, Directorate General of Mines Safety, Chaibasa Region, At & Post Chaibasa, District – Singhbhum West along with one copy of approved mining plan 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.

6/8/2010

(एस. टियु/ S.TIU)

क्षेत्रीय खान नियंत्रक / Regional controller of Mines

स्टील अथॉरिटी ऑफ इण्डिया लिमिटेड
STEEL AUTHORITY OF INDIA LIMITED
रॉ मेटेरियल्स डिवीज़न
RAW MATERIALS DIVISION

Ref.No.RMD/BBSR-BOM(Lease)/ 107/583 Date: 04.08.2010

To

The Regional Controller of Mines
IBM, Regional Office,
Mohani Complex, Chandrasekherpur,
Bhubaneswar, Orissa

Sub: Submission of Bank Guarantee towards Financial Assurance for an amount of Rs.1,38,26,750/- (Rupees One Crore Thirty Eight Lakh Twenty Six Thousand Seven Hundred Fifty Only)

Dear Sir,

With reference to your letter no: MP/OTF. MECH/08-ORI/BHU/2010-11 Dt: 20.07.2010 for submission of Bank Guarantee (BG) towards financial Assurance, we are submitting herewith BG bearing no: 2010127 IBGP0452 Dt: 02.08.2010 of IDBI Bank for an amount of Rs.1,38,26,750/- (Rupees One Crore Thirty Eight Lakh Twenty Six Thousand Seven Hundred Fifty Only) which shall be valid upto 31.03.2015 for mining plan of 6.90 sq ml lease of Bolani Ore Mines, SAIL for your kind perusal and further needful approval please.

Thanking you,

Yours faithfully,
For SAIL: Raw Materials Division

4/8/2010.

Encl: a/a.

(P.C.Naik)
DGM (Liaison)

✓ Copy: To Shri D.K. Bose
RQP for preparation of Mine Plan
of 6.90 Sq.ml. of BOM, Bolani.

IDBI BANK

No. 265956

Branch:-INDIAN RED CROSS SOCI. BUI., 1 RED CROSS ROAD NEW DELHI - MAIN BRAN

To
THE REGIONAL CONTROLLER OF MINES
MAHANEE COMPLEX,308 DISTRICR CENTER,
CHANDRASEKHARPUR,BHUBANESWAR-751016

Dear Sir/Madam,

Bank Guarantee No: 2010127IBGP0452
Amount (Rs.) 13826750.00
Guarantee Cover From 02-08-2010 To 31-03-2015
Last date for Lodgement of Claim 31-03-2015
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 INDIAN RED CROSS SOCI. BUI., 1 RED CROSS ROAD NEW DELHI - MAIN BRANCH 1 (Hereinafter referred to as ''the Bank'') in favour of
THE REGIONAL CONTROLLER OF MINES,MAHANEE COMPLEX,308 DISTRICR CENTER,,CHANDRASEKHARPUR,BHUBANESWAR-751016,,
(hereinafter referred to as ''the Beneficiary/_____'')
for an amount not exceeding Rs.13826750.00
(Rs.One Crore Thirty Eight Lakh Twenty Six Thousand Seven Hundred Fifty onl
at the request of STEEL AUTHORITY OF INDIA LTD
(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.13826750.00
(Rs.One Crore Thirty Eight Lakh Twenty Six Thousand Seven Hundred Fifty onl
and the Guarantee shall remain in full force up to 31-03-2015(expiry date) and can not be invoked otherwise than by a written demand under this Guarantee served on the Bank on or before the 31-03-2015 (last claim date)
The beneficiary is advised to seek a confirmation of the issuance of this Guarantee from the controlling office/Head Office by enclosing a copy of the same.

This Guarantee consists of five pages including this page.

Authorised Signatory

RAVITA WADHWA
Assistant General Manager
EIN - 641561

contd 2..

Authorised Signatory

तरुण मेहरा
TARUN MEHRA
EIN-6378

दिल्ली DELHI

L 539298

BG NO. 2010127IBGP0452 **DATED 02-08-2010**

The Regional Controller of Mines,
Mahanee Complex,308,
District Center,Chandrasekharpur,
Bhubaneswar-751016

Dear Sir,

Guarantee No.2010127IBGP0452
Amount of Guarantee Rs.1,38,26,750/-
Guarantee Period from 2nd August 2010 to 31.03.2015
Last date for lodgment of claim 31.03.2015

This Deed of guarantee executed on 2nd August 2010 by the IDBI Bank Limited, a company constituted under the Companies Act 1956 and deemed to be a banking company under the Banking Regulation Act 1949 having registered office at IDBI Tower, WTC Complex, Cuffee Parade, Mumbai – 400 005 and amongst other places a branch office at 4th Floor, Red Cross Society , Red Cross Road, New Delhi 110001, (hereinafter referred to as the bank) (hereinafter referred to as the bank) 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.1,38,26,750/- (Rs. one crore thirty eight lakh twenty six thousand seven hundred fifty only) at the request of SAIL/RMD, Bolani Ore Mine (hereinafter referred to as the Contractor/s)

For IDBI Bank Ltd.
Authorised Signatory

For IDBI Bank Ltd.
Authorised Signatory

This guarantee is issued subject to the condition that the liability of the bank under this guarantee is limited to maximum of Rs.**1,38,26,750/- (Rs. one crore thirty eight lakh twenty six thousand seven hundred fifty only)** and the guarantee shall remain in full force up to 31.03.2015 (date of expiry) and cannot be revoked on or before 31.03.2015 (last date of claim) by the Bank or applicant.

SUBJECT TO AS AFORESAID

BANK GUARANTEE AND CO-ACCEPTANCE BOND

1. Agreement on production of a Bank guarantee for Rs. 1,38,26,750/- (Rs. one crore thirty eight lakh twenty six thousand seven hundred fifty only) under rule 23F of MCDR, 1988.

2. We IDBI Bank Ltd.,at the request of M/s SAIL/RMD (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. 1,38,26,750/- (Rs. one crore thirty eight lakh twenty six thousand seven hundred fifty 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 Rule 23A, B & 23E of MCDR, 1988 i.e. Mine closure plan/progressive mine closure plan approved in respect of the mining lease for Bolani Manganese & Iron Mine over an area of 1586.36 Hects. granted by State Government to M/s Steel Authority of India Limited, Bolani Ore Mines situated in Barbil Tehsil at Champua sub-division, Keonjhar district of Orissa state, by reason of any breach of the said lessee of any of the terms or conditions contained in the Mine closure plan/progressive mine closure plan.

3. We, IDBI Bank Ltd.,do hereby undertake to pay the amount due and payable under this guarantee without any demur, to the authority merely on a demand from 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. However our liability under this guarantee shall be restricted to an amount not exceeding Rs.1,38,26,750 (Rs. one crore thirty eight lakh twenty six thousand seven hundred fifty only).

4. We undertake to pay to the authority on a demand from the Regional Controller of Mines, Indian Bureau of Mines, Bhubaneswar or any other officer authorized by the Controller General, Indian Bureau of Mines or Govt.

For IDBI Bank Ltd.

Authorised Signatory

For IDBI Bank Ltd.

Authorised Signatory

of India any money so demanded 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.

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.

5. We, IDBI Bank Ltd.,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 of 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 31.03.2015, we shall be discharged from all liability under this guarantee thereafter.

6. We further agree that Regional Controller of 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 powers exercisable by Regional Controller of Mines, Bhubaneswar against the said lessee and to forbear or enforce any of the terms and conditions relating to the said agreement, we (bank) shall not be relieved from our liability by reason of any such variation or extension being granted to the said lessee or for any forbearance, act or omission on the 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.

7. This guarantee will not be discharged due to change in constitution of the bank or lessee.

8. We, IDBI Bank Ltd.,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.

For IDBI Bank Ltd.

Authorised Signatory

9. Notwithstanding anything contained herein :

   a) Our liability under this Bank guarantee shall not exceed Rs. 1,38,26,750/- only).

   b) The bank guarantee shall be valid up to 31.03.2015.

   c) 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 31.03.2015.

10. If the bank guarantee is to be en-cashed through the court, in that case the Bhubaneshwar (city where Regional office, IBM is located) court will have jurisdiction.

11. In witness whereof, the bank through its authorized officer has set its hand and stamp on this 2nd Day of 28th August, 2010 at Delhi

Rs.1,38,26,750/-
31/03/2015
31/03/2015

RAVITA WADHWA
Assistant General Manager
EIN - 641561

तरुण मेहरा
TARUN MEHRA
EIN-6378

Phone Nos. (0674) 2744430/ 2742463
Fax No. (0674) 2744430

भारत सरकार
खान मंत्रालय
भारतीय खान ब्यूरो
क्षेत्रीय खान नियंत्रक का कार्यालय

No. MP/ OTF.MECH/08-ORI/ BHU/ 2010-11

महानी काम्प्लेक्स, दूसरी मंजिल
308, डिस्ट्रिक सेन्टर चंद्रशेखरपुर
भुवनेश्वर–751016

दिनांक / Date: 20.07.2010

To

M/s Steel Authority of India limited
Raw Materials Division
Industry House, 10 Camac Street
Kolkata – 700 017

Sub: Approval of Mining Plan of Bolani Manganese & Iron Mine along with Progressive Mine Closure Plan (PMCP), over an area of 1586.36 ha, in Keonjhar district of Orissa state, submitted by M/s Steel Authority of India Limited under Rule 24A of MCR 1960.

Ref: (1) Your RQP letter No. Nil dated 17.03.2010.
(2) This office letter of even number dated 11.06.2010.
(3) Your RQP letter No. Nil dated 05.07.2010

Sir,

This has reference to the letters cited above on the subject. In this connection the Financial assurance calculation submitted in this office vide letter dated 05.07.2010 has been considered and examined by the inspecting officer. It is found by and large satisfactory and therefore, you are advised to submit Financial Assurance for an amount of Rs 1, 38, 26, 750/- (Rupees One Crore Thirty Eight Lakh Twenty Six Thousand Seven Hundred and Fifty only) under Rule 23 F of MCDR, 1988 immediately for further necessary action at this end.

भवदीय / yours faithfully,

20.7.2010

(एस. टियु/ S.TIU)
क्षेत्रीय खान नियंत्रक / Regional controller of Mines

FAX

TO: GM(MINES), BOM, BOLANI
RPT: DGM(ERL), RMD, KOLKATA
REQUEST FOR PAYMENT OF FINANCIAL ASSURANCE POSITIVELY BY 3RD AUGUST, 2010
FROM: DGM(L), RMD, BBSR
COPY:- EXECUTIVE DIRECTOR, RMD, KOLKATA :—
For information Sir

BROJO-DHAM
11/A, Akshay Dutta Lane,
Calcutta - 700 006
Phone : (033) 2530 8200
e-mail : dkbbolani@yahoo.com

05th July, 2010.

The Regional Controller of Mines,
Indian Bureau of Mines,
Mahani Complex - 2nd floor,
308, District Centre,
Chandrasekharpur,
Bhubaneswar 751 016.

Dear Sir,

Sub. Approval of Mining Plan of Bolani Manganese & Iron Mine alongwith PMCP, over an area of 1586.36 ha, in Keonjhar District of Orissa state, submitted by m/s Steel Authority of India Ltd. under Rule 24A of MCR 1960.

Reference your letter no.MP/OTF.MECH/08-ORI/BHU/2010-11, dated 11.06.2010, I beg to submit the abovementioned Mining Plan (MP) alongwith PMCP. The MP has been modified in accordance with your scrutiny remarks and directives.

2. The MP (with PMCP) is submitted in five (5) copies. The text, annexures, plans, photographs, one CD, all your scrutiny comments and our responses thereto, Certificates by the Nominated Owner and RQP are kept in one and same folder.

3. Response and action in respect of your latest scrutiny comments, stated in the Annexure to your aforesaid letter, are mentioned in the sheet kept next to the copy of your said letter in this MP.

4. The figures in the Financial Assurance table have been reworked as per your directive and cost estimates recalculated (pp.42). Upon your approval of the calculation necessary Bank Guarantee will be furnished.

5. I shall be grateful if you kindly approve the MP at an early date.

Thanking you,

Encl. 5-copies of MP

Yours faithfully,

Dilip Kumar Basu Bose.

Dilip Kumar Basu Bose
Registration No. RQP/CAL/098/88/A

BROJO-DHAM
41A, AKSHAY DUTTA LANE
CALCUTTA-700006

PHONE: (033) 2530 8200

17th March, 2010.

The Regional Controller of Mines,
Indian Bureaun of Mines,
Mahani Complex - 2nd floor,
308, District Centre,
Chandrasekharpur,
Bhubaneswar 751 056.

Dear Sir,

Mining Plan (u/R 24A of MCR, 1960) including PMCP (u/R 23F of MCDR, 1988) for 1586.36 ha (6.90 sq miles) ML of SAIL-RMD-Bolani Ores Mines in Keonjhar Dist., Orissa.

Further to our letter to you dt.16.02.2010 (copy attached) I beg to submit the aforesaid M.Plan, in duplicate, for your kind scrutiny and approval.

2. The M Plan has been modified/revised in the light of discussion the undersigned had with your Mining Geologist, Shri D Dash, in your office on 25.02.10, and as per kind advice he tendered.

3. The page no. in the text where mention occurs of our action/response to your scrutiny remarks is given in the sheets annexed to the copy of your scrutiny remarks, and are placed just after the Contents (List of Plans).

4. The text, annexures, photographs and the plans (drawings) - all are kept in one folder.

5. As the long pending renewal of the lease needs approval of this Mining Plan I request you to kindly accord it early.

Thanking you,

Encl.

Yours faithfully,

Dilip Kumar Basu Bose

Dilip Kumar 'Basu' Bose
Registration No. HQP/CAL/098/88/A

Copy To The GM,
SAIL - RMD - BOM.
Bolani

with - 2 (two) copies of M.Plan without plans (drgs.).

1. **GENERAL**

a) Name of the Applicant : Steel Authority of India Limited (SAIL)

b) Status of applicant : A Public Sector Undertaking

c) Minerals occurring : Manganese ore minerals (pyrolusite, psilomelyne etc.,)
Iron ore minerals (Hematite, Goethite etc)

Intends to mine : Both manganese ore and iron ore minerals

d) Period granted : For 20 years from 14.11.1962
Application for renewal : Made on 11.11.1981, for first renewal.

Grant awaiting clearance from Forest Deptt.
For second renewal, submitted on 26.03.2002.

e) Name of RQP etc : Shri Dilip Kumar (Basu) Bose,
11/A, Akshay Dutta Lane,
Kolkata-700 006
Phone No. : 03325308200
Email : dkbbolani@yahoo.com
Registsration No. RQP/CAL/098/88/A
[valid upto 28.09.2010]

f) Prospecting Agency : All exploration, geological mapping, digging trial pits and trenches, as well as diamond drilling have been done departmentally - planning, execution (logging, analysis of cores included) and supervision done by Company's qualified technical personnel.

g) Ref No. & Date of Consent letter from the State Government. : Not applicable

अनुमोदित
APPROVED
6/8/2010
क्षेत्रीय खान नियंत्रक
REGIONAL CONTROLLER OF MINES
भारतीय खान ब्यूरो
INDIN BUREAU OF MINES
भुबनेश्वर/BHUBANESWAR

Dilip Kumar Basu Bose
Registration No. RQP/CAL/098/88/A

2 **LOCATION AND ACCESSIBILITY**

a) Details of area : The mining township of Bolani (22°6'50"N & 85°23'E) is situated in Champua sub-division of Keonjhar District, Orissa, close to the State boundary with Jharkhand. The lease area is the valley stretching from the foothills of the Bonai Range in the west to Barbil town in the East, dissected more or less at the middle by the river Karo. The 5.10 sq. Miles lease (for iron ore) of the Company (SAIL-BOM) lies adjacent on the West.

District & State : Keonjhar District of Orissa State
Taluka : Barbil
Village : Balagoda, Bolani, Limtur, Matkambeda, Barapada, Sundra, Santbahal(a part of Barbil town) and Seramda.
Khasra No. : Spread over 8 Nos. villages (Bolani, Balagoda,Limtur, Kolha Barpada, Seramda, Santhbahal, Sundra etc) of Barbil Tehasil of Champua Sub Division of District Keonjhar.

Plot No. : Total about 3201 plots
Block Range : Barbil Forest Range
Falling series :
Lease area (Hect) : 1586.36 Ha

Whether the area is recorded to be in Forest

Of the lease area, 512.66 Ha is in Uliburu Reserve Forest, and
774.87 Ha is Khasra forest.
(421.34 Ha is Govt. Waste land, and 659.18 Ha is Tenants' land)

Note : As per letter No 221/ CZ , dt.05.02.09, from the Jt.Dir., Geology, Keonjhar, and memo No. 7720/Mines, dt.,07.02.09, from DDM, Joda, Keonjhar, from the area applied for , the following are to be surrendered:

25.94 Ha. Of Khesra / Village forest, and
174.44 Ha Reserved forest

Therefore , the lease area will stand reduced to 1586.36 Ha.
The areas to be surrendered are shown in Surface Plan (Drg. No. MP/MN/2)

Ownership/occupancy (Ref. Nos. of Govt's letters granting surface right)

1. Letter No. (M)2017, dt: 08.10.63 for 456.68 Hac
2. Letter No. (M)/2169 dt:31.10.63 for 14.53 Hac
3. Letter No. (M)/2053, dt: 31.08.65 for 8.29 Hac
4. Letter No. (M)1320, dt: 19.12.67 for 296.05 Hac
5. Letter No. (M)17, dt: 04.01.69 for 59.11 Hac
6. Letter No. (m) 814, dt: 14.09.71 for 74.09 Hac

Dilip Kumar Basu Bose
Registration No. MQ/CAL/098/88/A

Existence of public road, railway line if any nearby & approximate distance

District Board Road from Barbil to Kiriburu passes through this lease, as does the fully electrified Broad Gauge railway line - RKSN-Barbil branch of the SE Railway. The stretch from Barbil to Bolani is only for goods (ore) traffic.

Topo-sheet No. = 73 F/8

Latitude = From 22 °05' 08" N to 22 °07'58" N

Longitude = From 85° 19' 05" E to 85° 23' 12" E

Land use pattern :

Forest Karo RF	=	339.21 Ha
Tenanted Home stead	=	260.17 Ha
Agricultural	=	400.00 Ha
Grazing	=	nil
Village Forest	=	166.93 Ha
Waste land/Barren	=	420.05 Ha

b) General Location and vicinity map = (Vide Key Plan Drg No.MP/MN/1)
Showing area boundaries and
Proposed access routes
Scale 1:50000).

HISTORY of the Mine & Previous Mining Plan

Bolani Ores Ltd., initial owners of Bolani Ores Mines, had two mining leases. One on Bonai hill range, measuring 5.10 sq. miles, is for iron ore. The other in the valley from the foothills of Bonai Range in the West upto Barbil town in the East, covering an area of 6.90 sq. miles is for manganese ore.

The lease for manganese was granted on 14/11/1962. In view of occurrence of a few pockets of iron ore in the area it (iron ore) was included in the lease on 12/11/1981.

Mining of manganese ore began in April, 1966. Starting with a small 3300 mt in the first year, production rose to 32,592 mt in 1969, but fell to a mere 1895 mt in 1978, when mining was stopped, because of poor yield and high cost.

Total production during the period was 2,17,719 mt of which 57% was low grade (Mn content below 35%), 34% medium grade (Mn content between 35% & 45%), and 9% high grade ore (+45% Mn).

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With the objective of resuming operation a fresh round of exploration began in late 1990. There were both, geological mapping and diamond drilling. But no large occurrence of either ore, manganese or iron, was spotted.

The earlier and the first Mining Plan (MP) for the lease, prepared by Dilip Kumar (Basu), Bose, RQP, was submitted to the IBM on 19/03/1991. It was approved by the Controller of Mines (C), on 21/02/1992, vide his letter No. 314 (3)/91-MCCM(C)/MP-34, (Anex.-1A).

The said MP proposed, for exploration, starting in 1992-93, 20 Nos., bore holes every year for the next 5- years. And mining @ a little over 20,000 tonnes of each - iron and manganese ore - from the quarries nos. 4,5 and 7.

But there was no compliance on any front, exploration or mining. The reasons were, constraint of fund, depletion of known reserves/occurrences of acceptable grade ore estimated high cost of production, poor demand and unremunerative price.

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3 **GEOLOGY & EXPLORATION**

A) **Physiography**

The lease area covers about 4km (in N-S) and about 5 km (in E-W), stretching from the foothills of the Bonai range in the West upto Barbil town (22 °05' 08" N to 22 °07'58" N & 85°19'05" E to 85°23'12" E) in the East. It is dissected almost centrally by the northerly flowing Karo river. The ground is undulating (gently rolling) with a few small hillocks scattered in between. The highest contour is of 500m, and the lowest, 440m, vide key Plan (Drg No. MP/MN/1).

Drainage pattern

The part of the lease area on the Eastern side of the Karo slopes towards the river on the West, while the part on the West drains towards East.

General Geology

The area is a part of the valley on the Northern half of the Jone's Horse-Shoe shaped synclinorium, in between the iron ore / BHJ hills of Bonai range to the West and Thakurani in the East. Dominant rock exposed on surface is laterite forming low height ridges and mounds amidst large tracts of cultivated fields. A few isolated exposures of iron ore, BHQ/BHJ, Quartzite, and re-cemented iron ore also occur. The ground in the reserve forest area is strewn with float iron ore boulders concentration of which at places is quite high. Shale being soft does not occur right on the surface but is seen in the nala cuttings in the reserve forest area (The area marked on the geological map for shale is actually cultivated tract where number of diggings show weathered shale).

Rock types (Litho Units)

Laterite : At most of the places the rock is hard, brown to deep brown in colour, granular and heterogeneous with embedded pieces of iron ore, limonite, quartzite, manganese ore and phyllite. Only at two places, one in the north along Limtur Nala cutting quarry No. 7 and the other in South (quarry nos. 1 & 2), it is some-what massive and pisolitic, colour varying from light brown to pinkish. Formation of laterite is clearly due to water action on iron ore and shale. The concentration of iron or alumina is according to the proximity of iron ore or shale whichever is the case. As for manganese ore, laterite is essentially the host rock having often formed prior to the ore which at places has replaced it.

Shale : It is white to pink in colour, fine grained, compact (hardness varying), often kaolinitic and at places phyllitic. Structural features like bedding and foliation are seen occasionally. The dip is gentle to flat to the west and strike NE - SW conforming to that of the region. In quarry nos. 1 and 2 manganese ore is seen occurring within bedding planes of the shales.

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BHQ/BHJ : Banded Hematite Quartzite / Jasper is hard massive rock consisting of alternating bands of chalcedony (white) or jasper (pink) and hematite (deep grey or black). The bands vary in thickness from a few millimetres to several centimetres. The silica and iron contents vary according to the thickness of the bands. Upon weathering the bands loosen. This rock exhibits structural features very well. strike and dip conforming to the regional ones. Folding is seen occasionally but micro-faults are very frequent. At many places fractures and fault planes are filled with secondary silica which appears as veins.

Iron Ore : Whether insitu or float, iron ore is usually hard massive, steel grey to black brown in colour and varies in iron content from 55% to 63%. Banding is often obscure. The ore is weathered at many points and near quarry no. 5 there is a large exposure of limonite. Strike and dip wherever evident, conform to the regional ones. Minerals on hand specimens appear to be mostly hematite with some limonite and goethite. Formation of the ore is attributed to selective leaching and re-deposition.

Manganese Ore : Surface occurrences of this ore at present are few and far between. But as reported by earlier workers originally there were quite a large number of deposits scattered at different places. However, spatial alignment (disposition) followed broadly the regional strike direction (vide geological Plan No. MP/MN/3). Exposures were of boulders of various size and having varying manganese content (from 10 / 15% to as high as 54%). Majority of them were in laterite. But in quarry nos. 1 & 2, the ore is embedded in shale/phyllite, the latter having a lateritic capping. In quarry no. 10, the ore occurs in quartzite as fissure filling. The mode of occurrence in laterite is like lenses / pockets of irregular extent varying widely in length, breadth and depth highly heterogeneous. In several cases laterite has been found to have been replaced by manganese.

Except in quarry nos. 4 & 7, the ore is relatively hard, exhibiting some times colloform bands or spheroids. On hand examination the dominant mineral is thought to be PYROLUSITE. Radiating needle shaped crystals resembling and possibly replacing goethite and pisolitic structures are also found. Strike and dip are not manifested in the ore.

Manganese content of the ore has been found to be varying from 51 - 52% (in quarry no. 1, host - shale) to 14-15% (in quarry no. 4, 5 & 7 ; host-laterite). Iron, the other major constituent varies accordingly from around 4% (in quarry No.1) to 20-25% in quarry no. 4 and 5. Alumina content in ore varies from below 2% (in quartzite zones) to 8-10% when in laterite. Similarly silica is high (7-9%) when the host is quartzite to a low of 2-3% when it is shale. Analyses of a few samples are given below.

Quarry	Mn.%	Fe%	SiO_2%	Al_2O_3%
No. 5	34.66	21.60	4.08	1.02
No. 4	30.59	24.30	2.28	6.04
No. 7	35.71	19.30	5.20	1.78

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Formation of ore is attributed to solution and re-deposition. According to some scientists the shale is the source rock, but no evidence has been found in this area to support this theory. Concentration / enrichment of the ore bodies might have been due to local pH and other factors.

Sequence (Stratigraphy) - According to Jones (GSI. Mem.Vol.63, pt.II) who mapped this area first, the shale hosting manganese is thought to be older than BHQ/BHJ and belonging to Iron Ore Series (Archaean age). The contact between the two has not been established in the area covered in this report. Laterite is younger to both Shale and BHQ/BHJ. As stated above, manganese ore bodies were formed subsequent to or during the late stages of lateritisation. Quartzite is clearly secondary and is likely to be of same age as laterite. The broad sequence, therefore, works out to:

Manganese Ore
Laterite (and recemented Iron Ore) and quartzite
Float Iron Ore
BHQ / BHJ : Iron Ore
(Lower) Shale

b) **Geological Plan & details of exploration**

The Geological Plan (Drg No. MP/MN/ 3) is prepared in the scale of 1:5000, permission for which has been granted by the Chief Controller of Mines, IBM, - vide his letter no. N-11013/61/MP/07.Ccom, dated 17.09.2008, copy at **Anx. 1**. The Plan, besides regular features shows exploration sites, both past and proposed. Past holes are shown in Red, while those proposed are in 5 different colours, one for each of the five years.

Ultimate pit limits for the Quarry No. 5. RL of its final pit bottom, and those of sites for stacking dressed and sub-grade ores, as well as waste dump are shown in another plan drawn in the Scale of 1:2000. (Drg. No. MP/MN/3A).

Past Exploration

A note on past exploration together with logs of bore holes drilled in 1990-91, are given in Anx. 1B.

c) **Geological sections**

Cross sections along line A-A from lease boundary to lease boundary, drawn in the scale of 1:2000, is in the Northern sector of the lease in order to include Quarry No. 5, which is proposed to be mined in next 5 years (Drg. No. MP/MN/4). A few more sections, in the scale of 1:5000, have also been drawn to cover existing quarries of 4, 5 and 7 and their vicinity where extensive drilling have been done. (Drg No.s MP/MN/4A & MP/MN/4B).

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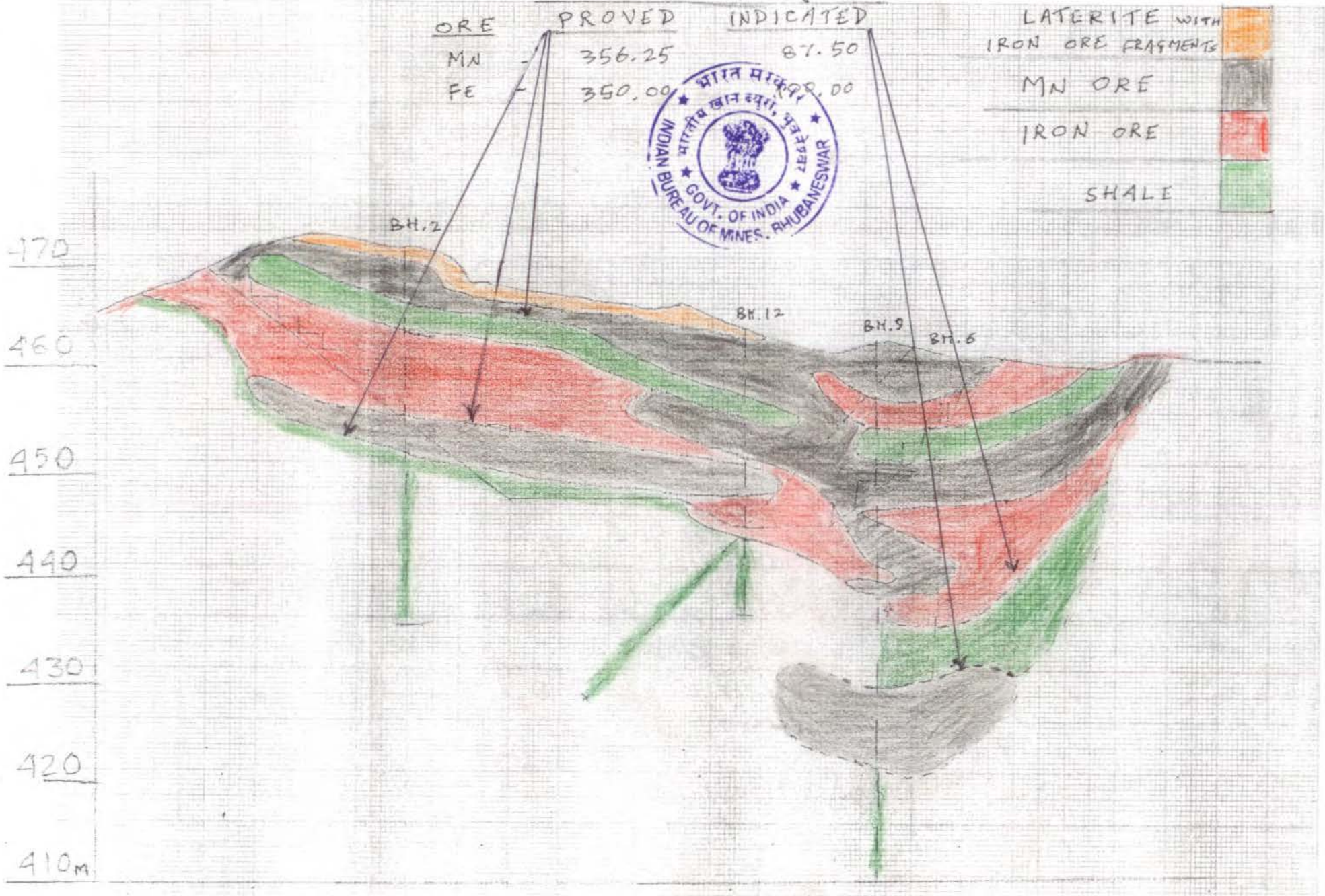
SECTIONAL AREA (M^2)

ORE	PROVED	INDICATED
MN	356.25	87.50
FE	350.00	0.00



SECTION 5/3

SCALE 1:500

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d) **Year-wise programme of future exploration including that of iron ore**

Exploration in future in this lease will be done mainly by core drilling, and not in form of pits or trenches. Because of non existence of any continuous patch/band exceeding 70-80m in length of either manganese or iron ore, siting of the holes will have to be deposit specific (potential areas). A regular interval between the holes may not be possible to maintain - but in no case they will be more than 100m apart in iron ore bearing areas or 50m in case of manganese ore. Of the 45 holes, to be drilled in next 5 years, ten will be on exclusive outcrops, albeit small, of iron ore. However, as evident from past bore hole results (vide Anx. 1B) several holes encountered iron ore bands of substantial thickness occurring interbanded with manganese ore as well as shale. There will be drilling on the floors of Quarry nos. 6, 8 and 10, with a view to ascertain exhaustion of ore. If no ore is found they will be filled up and afforested.

Seemingly barren laterite, limonite and phyllite tracts will also be drilled (at longer interval of 500m) to see if any ore occurs beneath.

Year-wise programme will be as follows:-

Year	No. Of holes	
2010-11	5	The first hole will be on the ground earmarked for reject dump to make sure it is barren
2011-12	10	
2012-13	10	
2013-14	10	
2014-15	10	
Total	45	

From this campaign areas around Slime Pond, Ore Processing Plants, Railway line Siding, public roads, Village (, Balagoda, Bolani and Limtur) staff residential colonies (of BOM and the Rlys.), and the Water Intake plant on the Karo river will be excluded.

e) **Ore reserves**

Method of estimation

All surface outcrops, exposures in the quarries and bore hole occurrences are plotted on the relevant transverse sections (scale 1:500, vide Drgs, No.s MP/MN/4A & 4B).

Proved ore is bound by a firm line joining the surface occurrences with the points encountered in the bore holes. In case of bands, only ore widths were taken.

Indicated ore is from the lowest points of 'proved ore' upto the point geologically extrapolated (vide diagrams on the left) marked by broken line.

Gross sectional areas (m^2) - vide page 9A - is multiplied by average interval between the sections to get the ore (R.O.M) volume (m^3), separately for proved and indicated ores.

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Parameters

	For manganese ore	For iron ore
Cut-off grade	15% Mn	43% Fe
Strike influence	3 m	6 m
Tonnage factor	2.38 tonnes/m^3	3.50 tonnes/m^3
% yield of crude ore/m^3 excavation	25	50

Reserves on the basis of latest round of exploration and computed as described above are as follows : (tonnes)

	MANGANESE ORE				
Grade Mn%	**Low Below 35**	**Medium 35-45**	**High above 45**	**Total**	**UNFC code**
Proved	128100	46415	33830	208346	**221**
Indicated	49430	17010	11310	77750	**222**
Average Grade =	28.82% Mn 24.17% Fe 2.53% SiO_2 4.55% Al_2O_3				

	IRON ORE					
Grade Fe%	**45-50**	**50-55**	**55-58**	**Above 58**	**Total**	**UNFC Code**
Proved	90352	82420	38565	232447	443784	**221**
Indicated	24924	22736	10638	64120	122418	**222**
Average grade =	57.24% Fe 2.31% SiO_2 4.92% Al_2O_3					

UNFC codification (Detail justification)

For the purpose of this, these irregular shaped pockets and lenses/bands of both manganese and iron ore deposits in this lease are to be considered to be belonging to Group IV type, as given on pp. 137 of the MCDR, 1988.

In view of fairly detail exploration through geological mapping, close grid drilling, pitting, trenching, close spaced sampling, besides decade long actual mining, well known yet simple method of ore grading, established specific end use, availability of an approved Mining Plan with EIA-EMP data, existence of good infrastructure and market, but non-availability yet of Forest clearance permission suggest assignment of the codes of **221**, to all the abovementioned proved, and **222**, to indicated ore reserves.

f) Slice plans of quarry Nos. 4, 5 and 7 are given (Drg No. MP/MN/5)

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TABLE - I

~~ANNEXURE~~ -

C.S. Ref.	PROVED ORE Sectional area (m^2)		C.S. Ref.	INDICATED ORE Sectional area (m^2)	
	Mn.Ore.	I. Ore.		Mn.Ore.	I. Ore.
5/1	250.00	100.75	5/1	62.50	50.00
5/2	483.75	266.25	5/2	100.00	112.50
5/3	356.25	350.00	5/3	87.50	100.00
5/4	200.00	0.00	5/4	150.00	0.00
5/5	0.00	28.75	5/5	0.00	0.00
5/6	103.75	80.50	5/6	37.50	0.00
4/1	0.00	558.75	4/1	0.00	175.00
4/2	0.00	0.00	4/2	0.00	0.00
4/3	0.00	345.00	4/3	0.00	100.00
4/4	0.00	490.00	4/4	37.50	62.50
4/5	0.00	45.00	4/5	0.00	0.00
4/6	0.00	127.50	4/6	0.00	25.00
4/7	118.75	43.75	4/7	23.75	0.00
4/8	91.25	0.00	4/8	0.00	16.25
4/9	176.25	0.00	4/9	86.25	0.00
4/10	165.00	0.00	4/10	48.75	0.00
4/11	98.75	0.00	4/11	86.25	0.00
4/12	378.75	0.00	4/12	141.25	0.00
4/13	318.75	225.00	4/13	103.75	0.00
7/1	156.25	0.00	7/1	0.00	0.00
7/2	175.00	0.00	7/02	28.75	0.00
7/3	112.50	0.00	7/03	61.25	0.00
7/4	150.00	0.00	7/04	102.50	0.00
7/5	133.75	0.00	7/05	0.00	0.00
7/6	0.00	0.00	7/06	0.00	0.00
7/7	0.00	0.00	7/07	0.00	0.00
7/8	0.00	0.00	7/08	0.00	0.00
7/9	262.50	0.00	7/9	127.50	0.00
7/10	102.50	0.00	7/10	75.00	23.75
7/11	150.00	0.00	7/11	100.00	0.00
7/12	0.00	0.00	7/12	0.00	0.00
7/13	0.00	0.00	7/13	0.00	0.00
7/14	0.00	0.00	7/14	0.00	0.00
7/15	0.00	0.00	7/15	0.00	0.00
7/16	140.00	0.00	7/16	0.00	0.00
7/17	0.00	0.00	7/17	0.00	0.00

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Pre – feasibility study

Abstract : A pre-feasibility study provides a preliminary assessment with a lower level of accuracy than that of a feasibility study by which economic viability is assessed in detail. It justifies further investigations. It usually follows a successful exploration campaign and summarises all geological, engineering, environmental, legal and economic information accumulated to date on the project.

In projects that have reached a relatively advanced stage, the pre-feasibility study should have error-limits of ± 25%. In less advanced projects, higher errors are expected. Various terms are in used internationally for pre-feasibility studies reflecting the actual accuracy level. The data required to achieve the level of accuracy are reserves/ resources figures bases on detailed and general exploration, technological tests at laboratory scale and cost estimates i.e. from catalogues or bases on comparable mining operations.

The pre-feasibility study addresses the items listed under the feasibility study although not in as much details. It has got economic importance with respects to various cost elements like capital cost, energy cost, supply cost etc.

Introduction: The industrial organizations are complex in nature from technical, geological and economic point of views. Hence decision making becomes a problem unless data from all fronts are available in an accurate manner. Environment is changing day to day. However, advent of computer has supplemented solving the complex problem besides facilitating gathering of information in a huge and rapid manner. The pre-feasibility study basically deals with the parameters like geological, mining, environmental, processing, infrastructural, costing, marketing, economic viability and many other factors.

The instant case involves extraction of manganese ore from pocket deposits and also excavation of iron ore if encounters in the course of extraction of manganese ore in a very small scale within the lease adjacent to main iron bearing lease. It is in the valley. The scale of mining may be categorized under "small sized irregular shaped pockets".

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Economic Investigation:

The prima facie objective of any industry/ manufacturing unit is the economy. Because it has to pay for its employees, infrastructure, stakeholders, generate working capital and deposit for growth. But to consider first for return to the investment is the market price and marketability of the ore produced. The economy are of two types i.e. normal economic or exceptional economic. Normal economic reserves are that justify extraction under competitive market conditions. Thus average value of the commodity i.e. manganese ore mined per year must be such as to satisfy the required return on investment. Exceptional economic extractions are reserves that are extracted through govt. subsidies i.e. they are protected. Hence for this, technical and economic feasibility are to be considered during mine development stage since scale of operation is small.

Conceptual Study :

Conceptual study involves all categories of study like geographical, geological, technical, economic etc. in a very broader frame work in which accuracy level is about 50%. It involves scoping of the project. In the instant case project is old and manganese mining was done from 1966 to 1977 (12 years) in a number of deposits. Hence it does not involve such conceptual frame of studying the deposit, but to have economic consideration.

Pre-feasibility Study:

This is an intermediate step. In the engineering step, the accuracy level is $\pm$ 20%. Resources/ reserves, extraction, recovery, marketability of ore are considered. It precedes the feasibility study. In the instant case, the grade and economy of the operation in the small scale scattered/ pocket deposits are the important indices for consideration.

Feasibility Study & final Economic Analysis :

It has two parts

i) Feasibility study.
ii) Final economic analysis.

Feasibility study assesses in detail technical soundness and economic viability of manganese of mining project. It serves as basis for investment decision and as a bankable document for project functioning. Study constitutes the audit of all geological, engineering, environmental, legal and economic information accumulated in the project. Cost data are reasonably accurate (i.e. deviations within $\pm$ 10%) because no further investigation should be required for investigation decision. Normally reserve figures are taken from detailed exploration, technological, pilot tests, capital & operating cost calculation such as quotations of equipment suppliers.

In the instant case most of the lease area was explored through geological mapping (scale 1:2000), test pitting, trenching & lastly core drilling at close space (15 – 30 m).

Secondly the final economical analysis involves annual cash flow for the entire mine life. Since scale of mining is small, the investment is not in a major scale. Less no. of equip fleet is required i.e. one wagon drill, one excavator/ loader and two nos. of tippers. No processing plant is required neither installation of huge structures except site office and rest shelter. Cost of production is comparable with other mines in the region.

Further royalty, taxes, rent, rates etc. are to be considered during final economic analysis besides construction & maintenance of approach road, dust suppression etc.

The more important items to be addressed in a feasibility study are:

a) Geological condition:
   - Infrastructure.
   - Geology.
   - Legal matters.
b) Operating condition.
c) Environment.
d) Market Analysis.
e) Financial Analysis.
f) Risk Assessment

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Infrastructure:

It includes public utility services like roads, railways, etc. In this lease there is railway line and public road used by cluster of villages in the neighborhood. The road is used for transport of ore. Ore is dispatched through Bolani – Barbil rail link to different steel plants. For this project about 103 manual labourers will be required.

Geology :

The area is a part of the valley on the Northern half of Jone's Horse-scope shaped synclinorium, Dominant rock exposed is laterite forming low height ridges and mounds amidst large tract of cultivated fields shale being soft occurs in the nala. Surface occurrence of manganese ore is present at places. Spatial alignment follows broadly the regional strike direction. The ore occurs in quartzite as fissure filling at places. Manganese content in ore varies from 30 – 35%. Alumina content is < 2% & silica content is 7 – 9%.

Broad sequence of ore is
Manganese
Laterite
Float iron ore
BHQ/ BHJ : Iron ore
Scale.

Legal Matters :

The mining lease was granted on 14.11.1962 for 20 years and renewed for another period of 20 years. 2nd renewal applied on 26.3.2002. Stage – I clearance has been granted under F.C. Act'1980 with certain conditions to be complied with. Mining plan for this lease was approved vide letter no: 314(3)/91-MCCM(C)/MP-34 Dt:21.02.1992. Availability of tribal labour with aptitude for quality sorting was never a problem.

Mining Operation:

At present there is no production. There is proposal to produce @ 50,000 M3/ year of ROM excavation from quarry no: 5 which is under suspension since 1977. This will yield about 9000 tpy of saleable manganese ore. As iron ore occurs interbanded with manganese ore it will be around 1000 tpy.

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Mode of mining is to remove top three 5 meters over burden, drill 50mm blast hole and excavate blasted muck with back hole/ shovels. Transportation will be through 15te dumpers. Ore benches will be drilled through jack hammer & blasted ore will be stacked on pit top & sized to –100mm. Manual dressers will further break to –50mm size. The ore will be transported to railway siding after approval of Govt. authorities. All statutory requirements will be fulfilled during mining operation.

Environmental Management Plan :

All aspects like water regime, flora & fauna, quality of air, water & noise, climate condition, human settlement, public building, movements etc. shall be addressed to.

Market Analysis :

There is huge demand of the Manganese ore and rate is also substantial. Since it is used as raw materials in our captive steel plants, the quantity produced will be consumed. SAIL can have cost advantage because of captive source. Moreover, the demand of iron ore is also there & thus the ore produced will be of high economic value. At times, if it is to be sold in the market, there exists ample scope.

Final Analysis :

Final Analysis is done for the following indices :

- Capital cost.
- Cash flow forecast.
- Investment cost
- Inflation forecast.
- Sensitivity Studies.
- Closure Cost.
- Rehabilitation Cost.

Since scale of operation is low, this will be less capital intensive project & cash flow will be nominal for infrastructure, equipment & on other overhead. Rail head exists nearby & thus hauling distance of ore from pit is less. Although inflationary rate is high, this will have little impact since own capital will be deployed & no borrowing from financial institutions at a higher rate of interest. Moreover, the mine has cost centers already is use. Operating cost will be adjusted in the existing accounting system. Sensitivity study, closure cost and rehabilitation costs will be judiciously taken care of. Since mining operation in the adjoining lease will continued for long, all these aspects will be considered favorable.

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Risk Assessment is an index which shall be established through assimilating all governing factors in micro as well as macro - environment.

Conclusion :

The last decade has seen a surge in industrial growth which is about 8% in the global scenario. India has exhibited growth even during recession in Oct'2008. It is a fast growing nation and Indian National steel policy has envisaged a huge growth plan. To commensurate with this, SAIL has poised for a quantum jump in production & has already initiated investment in process upgradation, renovation and re-engineering in the product-mix and value added product. Thus ore is a potential resource for the process although quantity is low. Economy exists, so also the technology, but more stress is to be given on geological resource/ reserve. However, study forecasts a positive trend for future.

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4 **MINING**

(a) **Proposed work & method of mining**

At present there is no mining nor production. There is proposal in this Mining Plan to resume mining and produce @ 50,000 m^3/year of run-of-mine excavation from Quarry no. 5, which at the time of work suspension in 1977, was a regular working quarry. The said excavation will yield about 9000 tpy of saleable manganese ore. As iron ore occurs interbanded (mixed) with manganese ore it is expected that about 1000 tpy of iron ore will also be produced.

Mode of work will be removal first of the top three 5m (three 1.5m high benches) of overburden. Wagon drills will dig 50mm dia balst holes. Blasted material will be lifted by small capacity backhoe shovels and put on 15-tonner dumpers for dumping at specified site.

The ore in the benches beneath will be drilled by small dia jack hammers. Blasted ore will be similarly lifted on pit top and stacked on marked ground for subsequent sizing (down to -100mm) by the hand miners who will also sort out intercalated waste and throw that onto the dump.

The manual dressers will break the ore boulders further to -50mm size, grade according to Mn. content as well as sort out iron ore pieces, and stack the finished ores grade and mineral wise. The ores will be transported to the company's Railway siding after approval by the Government authorities.

(b) **Quantum of development & production (first 5 years)**

Stated in the table in next page (ii) .

(c) **Year-wise plans & sections**

Year-wise plans and sections of Pit no. 5 for 5 years commencing in 2010-11 **(Drg No. MP/MN/6 to MP/MN/10)** are enclosed

(d) **Supporting composite plan & section of Pit No. 5**

(Drg. No. MP/MN/11) is enclosed

(e) **Proposed rate of production when fully developed**

In case of manganese ore there is no proposal to raise the rate of production in next 5 years. The aim will be to stabilize at 15000 tpy of crude ore. In case of iron ore, production, considered as incidental to that of manganese ore, will be whatever quantity available of acceptable grade.

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Quantum of development & production (first 5 years)

Year	Quarry	Bench R.L. (m)	Development sectional area (m^2)	Total excavation (m^3)	Overburden (m^3)	Intercalated waste (m^3)	Stripping Ratio Ore :Waste	Crude Manganese & iron mixed (tonnes)	Dressed (saleable) Mn. Ore (tonnes)	Sub grade ore Mn (Tonnes)	Mineral rejects (tonnes)	Dimension of the quarry (L*B*D) m
2010-11	5	From 474 to 462.5 in 7 benches each 1.5 m high	1,155	50,000	24,700	19,000	1:8	15,000	9,000	2,000	3,000	110*50*10.5
2011-12	5	From 474 to 462.5 in 7 benches each 1.5 m high	1,155	50,000	24,700	19,000	1:8	15,000	9,000	2,000	3,000	110*50*10.5
2012-13	5	From 474 to 462.5 in 7 benches each 1.5 m high	1,155	50,000	24,700	19,000	1:8	15,000	9,000	2,000	3,000	110*50*10.5
2013-14	5	From 474 to 462.5 in 7 benches each 1.5 m high	1,155	50,000	24,700	19,000	1:8	15,000	9,000	2,000	3,000	110*50*10.5
2014-15	5	From 474 to 462.5 in 7 benches each 1.5 m high	1,155	50,000	24,700	19,000	1:8	15,000	9,000	2,000	3,000	110*50*10.5

Note :- 1. Exploration found no ore below 7th. Bench
2. Excavation will be NWW wards in which direction ore body extends
3. From past experience crude ore vol. Is expected to be 25% of r.o.m.
4. Tonnage factor : Mn ore 2.38 tonnes / m^3 ; Iron ore 3.50 tonnes / m^3
5. Dressing loss is about 20% of crude ore.
6. Manganese ore having less than 30% Mn. Is sub grade ore
7. Mineral reject is -10mm fraction generated in course of dressing / sizing
8. Production of Iron ore is entirely incidental and quantity can vary widely.

क्षेत्रीय खान नियंत्रक
REGIONAL CONTROLLER OF MINES
भारतीय खान ब्यूरो
INDIN BUREAU OF MINES
भुवनेश्वर/BHUBANESWAR

अनुमोदित
APPROVED

Dilip Kumar Basu Bose
Registration No RQ-/CAL/098/88

INDIAN BUREAU OF MINES, BHUBANESWAR

Life of the mine

Taking proved and indicated reserves together, 2.86 lakh tonnes will last @ proposed rate of mining of 15000 tpy, 19 years which will be the life of the mine, upto 2029-30.

Past working

During the 12-year period of mining operation in the lease (from 1966-67 to 1977-78) ten quarries were opened and worked. Brief description of those is given below. Work used to start around a previously dug trial pit showing occurrence of ore or a surface exposure. Expansion followed ore trail both laterally and vertically.

All mining was for manganese ore. There was never any mining of iron ore as this ore was included in the lease only in November 1981, long before which mining was suspended.

Quarry No. 1 &2	A pair of small pits located close to and to the West of Bolani village, had high grade bedded ore in phyllite at a depth of about 3m to 5m from laterite top. Work had to be stopped because of objection by the villagers suffering strong vibration in their houses at the time of blasting.
Quarry No. 3	Located about 150m NW of Q.2, this medium size pit yielded low grade ore occurring in laterite. It was closed down as output declined and subsequently Rly siding extended.
Quarry No. 4	The quarry consists of 3 pits, A, B & C, all about 400m to 500m West of Limtur village. Low grade ore occurs in ferruginous laterite at a depth of about 4m to 6m from surface. In one of the pits (4C) good quality iron ore was struck in course of drilling below 3-4m laterite top. At the time of suspension it was a running quarry and will be reopened in near future.
Quarry No. 5	Located about 250m West of the Limtur village this medium size quarry (100m x 70m) was also in operation in 1977-78. In it is present a 6-7m thick low grade ore band stretching for about 55m NNW ward under a 4-5m thick laterite cap. In this Mining Plan under report this quarry is proposed to be reopened first.
Quarry No. 6	Located about a km South of Q.5, it was a small pocket of low grade ore in laterite. Ore did not persist in depth. Mining stopped as availability of acceptable grade of ore fell.
Quarry No. 7	This quarry is a chain of small shallow pits along Limtur nala, about 600m to the West of Q. 4. The host rock is laterite. The ore is soft, about 5m thick running SE wards for 25m. At times of heavy rain the pits get inundated.

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Quarry No. 8 — An isolated occurrence in ferruginous laterite situated about 650m NE of the Shiva temple in Balagoda village. Its paltry reserve of low grade ore petered out quickly and work stopped.

Quarry No. 9 — A clustre of shallow small pits located about 400m SWS of the Karo bungalows and 50m from Rly track did yield low to medium grade ore. Mining had to stop as the Rlys. objected to blasting.

Quarry No. 10 — Situated on the bank of the Karo river, about 400m South of the Karo bungalows, it again was a clustre of small shallow pits where manganese ore occurred as veins and fissure fillings in fractured quartzite. Both high grade and sliliceous low grade ore was won. But quantity was small and reserve got exhausted in no time.

All quarries were opencast with a system of benches and were worked manually. Benches were 1.5m high and minimum 1.5m wide. Blast holes of 25mm dia were drilled by tractaire operated jack hammers. Hand miners sorted out ore from intercalated waste, sized those to -100mm boulders and put in boxes of size, (1x1x0.3)m. Waste and overburden were removed to specified sites for dumping. Occasionally, Pay loaders and Graders were used to shift dumps or to clear sites, while wagon drills were deployed for drilling large dia holes where o/b rock was hard. Benches of hard rock were permitted to be 3-5m high.

Dressers, again manual labour, would break the ore lumps further to (-50+10)mm pieces, sort according to Mn content and make stacks of different grades. Fractions below 10mm size were thrown onto dumps. Finished ore stacks were sampled and analysed. After checking and approval by Government officials there was transportation to despatch point

(f) CONCEPTUAL MINING PLAN

Although demand for manganese ore has revived lately together with upward price revision, and that for iron ore is going up continuously, exploration in the lease under report has not been successful so far in locating any sufficiently large deposit of either ore - vide note "Exploration in the past" at **Anx. 1B**.

A major constraint for exploration and mining in this lease hold is existence of villages (human habitation), public roads, Railway line and siding as well as installations required for the neighbouring iron ore mine of SAIL-BOM, like In-take Pump house, Wagon Loading Plant,Raw Water pipe line etc., which restrict blasting and digging. Mining (extraction of ore), therefore, is being resumed at the known sites of occurrences away from the aforesaid with aim to continue so long it is economically viable. Exploratory work will also go on side by side. The area to be further explored is the tract having Limtur Nala on the North and West, the river Karo in the East, and the Grid line E-2000, on the South. Exploration will also be carried out on the E-bank of the Karo river. There will be a few holes on the strip along Southern lease boundary all shown in the Geological Plan **(Drg No. MP/MN/3).**

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All this exploration will be done in the next 5-years as stated in para 3d. The scale of operation will not be increased in immediate future lest supporting facilities need to be enlarged though for a brief run. A short spurt of large scale work requiring elaborate supporting facilities like drilling, blasting, transportation and in particular, employment of hand miners and manual dressers in large number, followed by total closure (owing to exhaustion of economically mineable reserve) in 3-4 years time can give rise to multiple problems.

On the other hand, proposed pace of work spread over longer time will enable win all ore (manganese as well as iron) occurring in and around the pits.

Many a time pockets of ore escape detection in bore holes and trial pits dug in grids but are struck and exposed following trails in course of mining.

Considering all these factors, it is thought prudent to limit the rate of production to 15000 tpy of crude ore which will last the hitherto known reserves (together with resources) till 2031 AD, shifting work from pit No. 5 to pit No. 4 and No. 7, in that sequence, working one pit at a time.

Ultimate extent and size of the quarries nos. 4, 5 and 7, are shown in the Composite Plan (Drg No. MP/MN/12). Final slope angle at the time of close of mining will not exceed 45°, but as upon exhaustion of ore the pits will be back filled, the slope angle will not be evident.

Ultimate capacity of the mine, in terms of excavation, is 50,000m^3/year.

Besides laterite overburden, intercalated waste and ores, there will be generation also of sub-grade ore (material generally having less than 30% Mn and/or below 57% Fe, below current steel plants' specifications), and mineral rejects (arisings from dressing of ores, mostly below 10mm size fraction and likely containing high alumina).

The last two items can have prospect of use in future. Therefore, those will be put on separate specified sites and marked on plans so that in the event of demand those can be clearly reclaimed.

Of the total excavation in the Q. No. 5, 87% will be overburden and waste taken together. Hence, refilling of the quarry, i.e., rehabilitation after exhaustion of ore will be undertaken followed by afforestation.

Quarries Nos. 1,2 and 3, have already been filled up. Reclamation/rehabilitation of others will wait proposed round of exploration. Quarries found devoid of ore will be filled up (reclaimed) and afforested.

As learnt from all three rounds of exploration, occurrence of iron ore in this lease is more irregular and sketchy than that of manganese ore. Therefore, no regular production of iron ore can be planned. Whatever quantity is come across in course of mining manganese ore will be extracted, sized and stacked for eventual transport to the stockpile at the Wagon loading Plant where it will be mixed with the produce of the BOM's neighbouring iron ore mine. Production of iron ore, therefore, will be incidental to that of manganese ore.

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POST MINING LAND USE

Sl.No.	Mode of utilisation	Area in hactares
1	Quarrying/pitting	111.34
2	Dumping of minerals /waste/ top soil etc	61.36
3	Roads & conveyors	33.79
4	Processing Plant Work-shop etc	63.76
5	Slime pond	125.00
6	Township	215.00
7	Safety Zone	33.63
8	Railway	57.00
9	Unutilised area	885.48
	TOTAL	**1586.36**

Conceptual mining plan , Drg. No. MP/MN/ 12 is enclosed.

g) **Opencast mine**

(i) Salient features of mode of working

Mining in this lease has been and will continue to be opencast bench system. Benches in general, will be 1.5 m high and as much wide at least. In the direction of ore occurrence width and height of the benches may increase to 3m when it is hard rock. In pit no. 5, waste rock, crude as well as dressed ore, sub-grade ore when any, and the mineral rejects will be stacked on the pit head.

As the hand miners and dressers will deliver on these stacks, these can not be far from the pit side. The work will be in one 8 hour shift /day in day light hours, semi-mechanised - drilling of blast holes, pushing of waste rock heaps and transportation of finished ore will be done mechanically.

(ii) Lay-out of mine workings

Where laterite is host rock, occurrence of manganese ore seldom manifests any clear cut trend. And, mining excavation has to follow the direction of occurrence both horizontally and vertically. Indeed, all the pits, nos 4, 5, and 7 developed that way. In case of no. 5 latest round of exploration revealed continuation of ore NNW-ward for about 55m. The pit, therefore, is likely to expand in that direction.

h) Extent of Mechanisation

Small quantity of excavation, about 170m^3/day and non-availability of long working face do not give scope for engaging/stationing a permanent fleet of machines.

Thus drilling, blasting, excavation, removal of excavated material as well as transportation of finished ore to Rly siding - jobs to be done by machines - will be periodical and not continuous. Again, not all machines will work a time. For instance at a times of drilling shovel and dumpers will not have any work and vice versa.

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Calculation of requirement

The need will be of one wagon drill/tractaire-Jack hammer, one shovel, ~~couple~~ 2 Nos of 15 tonner dumpers for Waste removal and ~~2 Nos~~ of 10-12 tonner dumpers for transportation of finished ore.

Requirement of manual labour

Annual production of r.o.m	=	25,000m^3
Daily prodn. of r.o.m	=	25,000m^3/300 days
	=	83m^3
As 75% of 83 m^3 will be intercalated Waste, daily production of crude ore Ore will be	=	21 m^3
1 m^3 = 3 x (1x1x0.3)m size box		
Daily prodn. of crude ore	=	21 x 3 = 63 boxes
In the past OMS was	=	1.5 box
No. of hand miners required	=	83/1.5 = 55
Adding 20% for absenteeism etc.		11
Total need will be for	=	66 heads
Again, as per past experience one Dresser can size 2 boxes/day		
No. of dressers needed	=	63/2 = 31
Adding 25% for absenteeism	=	6
Total need of dressers	=	37 heads
Thus total manual labour need	=	66 + 37 = 103 heads

MISCELLANEOUS

To supply drinking water to the pit head, Company's water tanker will be used.

Sl. no.	Type	No.	Size/ Capacity (litres)	Make	Motive power	H.P
1	Water Tanker	1	9KL	Ashok Layland	Diesel	73
2	- do-	1	-do-	TATA	- do-	73

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Requirement of Machinery:

A) Total excavation per annum = 50,000 CuM
Daily excavation for 300 days working = $\frac{50,000}{300}$ CuM = 170 CuM/day

B) Shovel/ Backhoe capacity = 0.9 CuM
Bucket fill factor = 90%
Volume of excavated ore/ bucket = 0.81 CuM
No. of passes/ hr. = 60
Volume excavated/ hr. = 1.08 x 60 = 64.8 CuM
Hours utilized for 170 CuM = $\frac{170}{64.8}$ = 3 hrs.

One Shovel/ Backhoe to be engaged. One will be standby.

C) Dumper capacity = 15 Te (6.0 CuM)
No. of trips for total volume of 170 CuM = 170/6 = 29 trips
For a lead of 3 km round, the trips/hr = 3.0 trips
For 29 trips, 10 hrs will be utilised

Hence 2 dumpers can be utilized for total 5 hrs. for transport of ore and 2 dumpers for waste removal.

D) For volume of 170 CuM/ day,
Drill meterage required = 170/6 = 29 Mtrs.

At the output of 6 CuM/ meter

One wagon drill can drill 29mtrs. per shift

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16(a)

5 BLASTING

a) **Broad parameters**

	Ore	Overburden/Waste rock
Hole depth	1.5 m	(1.5 to 3) m
Hole dia.	100 mm	100 m m
Spacing	(1.5-1.8)m	(1.5 to 3.5)m
Sub-grade drilling	0.15m	(0.15 to 0.3)m
Hole depth	1.65m	(1.65 to 3.3)m
Charge/hole	0.71kg	(0.71 to 10)kg

Instead of blasting daily, attempt will be made to do every alternate day or twice a week. This will need exposure of sufficient work space.

b) **Type of explosives** - (i) Slurry
(ii) OCG/GN,

c) **Powder factor** - In Ore = 0.16 kg/mt

In OB/Waste rock/ = 0.12 kg/mt
Development = 0.12 kg/mt

d) **Whether secondary blasting is needed** - Seldom

e) **Storage of explosives** - There are three magazines details of which are given in the next sheet. Locations can be seen in the Surface Plan (Drg No. MN/MP/2).

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STORAGE OF EXPLOSIVES

MAGAZINE NO. 1	
LICENCE NO. (E-25 (14) - 145/i/OR-174/EX)	
Class-2	2661.00 kg
Class-3	1875.00 kg
Class06-Divn.-1	60,00.00 Metres (Safety Fuse)
Class-6-Divn.-2	15,240.00 Metres (Deto-Fuse)
Class-6-Divn.-3	40,000 Nos. (Detonators)
MAGAZINE NO. 2	
LICENCE NO. (E-25 (14) - 145/ii /OR-213/EX)	
Class-2	2661.00 kg
Class-3	1875.00kg
Class-6-Divn.-1	40,000.00 Metres (Safety Fuse)
Class-6-Divn.-2	15,240.00 Metres (Deto-Fuse)
Class-6-Divn.-3	40,000 Nos. (Detonators) - Elect & Ordinary
MAGAZINE NO. 3	
LICENCE NO. (E-25 (14)-145/iii/OR-214/EX)	
Class-2	4136 kg
Class-6-Divn.-1	40,000.00 Meters (Safety Fuse)
Class-6-Divn.-2	15,240.00 Meters (Deto-Fuse)
Class-6-Divn.-3	40,000 Nos. (Detonators) [ED-15000+OD-25000]

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6. **MINE DRAINAGE**

a) **Depth of water table**

The depth varies from 1.4m to 14.2m below local surface as observed in open wells in Balagoda and Bolani villages, and tube wells dug by the Government in Bolani township. The levels vary seasonally, dipping in summer and rising after monsoon. In lateritic terrain which is most of 6.90 sq. Miles lease area, there is no regular ground water table.

b) **Workings expected to be below Water Table**

Work level in none of the three pits of 5, 4 and 7 will go below local ground water table. This is apparent from bore hole findings.

c) **Quantity & Quality of water likely to be encountered**

No submergence/flooding of the pits will happen. Hence, need for quality study, pumping and selection of discharge site does not arise.

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7 **STACKING OF MINERAL REJECTS & DISPOSAL OF WASTE**

a) In next 5 years **Nature and quantity of**

i) **top soil** - There is no top soil in and around pits nos. 5, 4 and 7.

ii) **Overburden & Waste rock** - In the said pits it is mainly laterite, with occasional limonite, moorum, float BHQ and quartzite. Rarely shale/phyllite is found.

iii) **Mineral rejects** - These are below 10mm pieces where ore is intimately intercalated in laterite, quartzite etc.

b) Estimated generation

Year	Top soil	O.B + Waste (m^3)	Mineral rejects (mt.)
2010-11	Nil	43700	3000
2011-12	Nil	43700	3000
2012-13	Nil	43700	3000
2013-14	Nil	43700	3000
2014-15	Nil	43700	3000

c) **Land chosen for disposal of waste**

For each of the three pits the sites are shown in the Surface Plan (Drg No. MP/MN/ 2). The reason for choice is, as per bore hole findings, non-occurrence of ore beneath. Other reasons are : not very far from working points, so that miners/dressers will not be required to carry loads too far, and generally flattish terrain so that dumped material do not wash down in rain.

d) **Manner of disposal of Waste : Configuration & Sequence**

Blasted rocks (mostly laterite) from barren benches atop ore will be lifted by small backhoe shovels and put on 15 tonner dumpers for dumping at specified sites. Dumping will be retreat dump method. The individual terrace heights will be restricted to 10m. Each terrace will have inward slope with catch drains at the inward side of the terrace. Such drains of individual terraces will be connected to

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the garland drain outside the periphery of the dump. These catch drains will have half concrete open pipes followed by settling tanks to avoid wash-offs. Each terrace will have berms at the outer ends to reduce gully formation due to rain-water wash-offs. Dumps will be rectangular in shape.

e) **Sub-grade ore**

This is ore below standard grade, not acceptable to the consumers. Neither the occurrence nor the quantity and/or exact grade are definite. When encountered in course of mining, this ore is extracted, sized and stacked separately at the pit head. At the first available opportunity this ore is blended with higher grade material and despatched. On the basis of past history, about 13-14% of crude ore is sub-grade in these 3-pits.

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8. **USE OF MINERAL**

a). **End use of manganese ore** It will be by Company's steel plants as feed in small quantity, as raw ore, in their blast furnaces mixed with the main feed, iron ore. Also , by a subsidiary of the Co., Maharasthra Electrosmelt Ltd., located at Chandrapur, Maharasthra, for making alloys like , ferromanganese.

End use of Iron ore : All ores from BOM, both lumps and fines, are used by the Co.'s (SAIL) steel plants, dominantly Durgapur Steel Plant (DSP) and some times Bokaro Steel Plant, to make iron and steel.

b) **Physical and chemical specifications** of manganese ore for steel plants:

Size = (10 -40) mm Lumps

Grade	Mn%	Fe%	SiO_2%	Al_2O_3%	P%
Low	30-35	22 max	7 max	7 max	0.15 max
Medium	35-45	12 max	7 max	5 max	0.15 max
High	46-48	8 max	5 max	5 max	0.08 max

For Iron ore

Product	Physical (size)	Chemical (Assay)		
		Fe%	SiO_2%	Al_2O_3%
Lumps	(-30 + 6) mm	65.0	2.0 max.	2.0 max.
Fines	(-6 mm +100 mesh)	64.5	2.0 max.	2.0 max.

Total gangue in either product not to exceed 4.0%
Bokaro accepts the specification

c) **Details of blending, if any**

No exclusive blending operation will be there for either ore .

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9 **OTHER**

a) **SITE SERVICES**

i) **Mine Office**

Permission will be sought from the Director of Mine Safety to locate the statutory mine office (where statutory records and plans will be kept) near the Vocational Training Centre. There will be a small field office where registers of attendance and a few records will be maintained.

ii) **Rest shelter and First aid Centre**

There will be Rest shelter near the pit. It will have First aid Box, stretcher and rugs under the charge of a qualified First aider.

iii) **Mobile Canteen**

Service of mobile canteen will be provided at the pit head.

iv) **Supply of drinking water**

Supply at the pit head will be made by Water tanker which will get filled from the reservoir of filtered water located near the VTC.

The following services/facilities will be shared with the Company's iron ore mine in the adjacent 5.10 sq. Miles ML.

Vocational Training Centre (VTC)
Workshop (Mech. & Elect)
Planning & Survey
Laboratory & Sampling
Stores.

v) **Vocational Training Centre (VTC)**

The lessee runs a group type Training Centre fully equipped and staffed. There are two class rooms, one work shed, one model room, a library and an office. Besides usual implements, audio-visual aids are also there.

All types of training required under MVT Rules are imparted.
Workers of the manganese mine will be given training here.

vi) **Workshops** - There are two well equipped mechanical work-shops, one at the Hill-top campus and the other in the valley.

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The facilities available are:-

Engine & sub-assembly room,
Machine shop with lathes, drilling & milling machines, power saw, hydraulic press etc.
Auto-electric section,
Welding & Smithy,
Tyre repair,
Tractaire & Compressor room,
Washing bay,
Tool room,
Lubricant room.

vii) **Planning & Survey** - The service of the fully equipped survey office for preparation and storing of statutory plans will be extended to the Manganese mine. It is headed by an Asstt. General Manager (Survey) and is located at the Hill top campus.

viii) **Laboratory & Sampling** - The services of the sample preparation gang headed by a qualified geologist, sample preparation shed located near the Wagon loading plant, and the laboratory, for chemical analysis, located at the Hill top campus will be made available to the Manganese mine.

ix) **Stores** - The facilities of the Stores located at the Hill-top campus as well as in the valley will also be available to the Manganese mine.

b) Employment Potential -

Highly skilled	:2
Skilled	:5
Semi-skilled	:2
Un-skilled	:103 (Hand miners and dressers)

When work starts, the mine will have an Agent, following statutorily qualified officials :

Statutorily qualified
Mine Manager,
Mine Surveyor,
Welfare Officer,
Safety Officer,
Mine Foreman,
Mining Mate,
Blasting Foreman/Mate

as well as qualified geologists (for exploration and quality control) and a Mining Engineer (to supervise drilling).

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Managerial Staff.

When work starts the mine will have an Agent (as per R 8A of MMR, 1985) and the following statutorily qualified officials:-

One Mine Manager	-	a whole time mining engineer holding degree in mining engg., and possessing, at least, a First Class Manager's Certificate. [R.42(i) (b) of MCDR 1988 & R.34 of MMR, 1961]
One Mine Surveyor	-	person holding Surveyor's certificate (R.38, of MMR 1961)
One Welfare Officer	-	Person holding a University degree and passed degree/diploma in Labour Welfare [R.72 of the Mines Rules, 1955]
One Safety Officer	-	a whole time mining engineer holding degree in mining engg., and possessing, at least, a First Class Manager's Certificate. [R.42(i) (b) of MCDR 1988 & R.34 of MMR, 1961]
One Mine Foreman	-	person holding Foreman's certificate (R.38 of MMR, 1961)
One Mining Mate	-	person possessing Mate's certificate (R.38 of MMR 1961)

There will also be a Geologist (holding post graduate degree in the subject) to supervise exploration and quality control, and a Mining Engineer for bore hole drilling.

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10 **MINERAL PROCESSING**

a) **Nature of processing/beneficiation**

There will be no beneficiation or processing of any of the ores. Manual sizing and sorting into different grades will be final.

b) **Disposal method of tailings**

There will be no tailings to dispose of.

c) **Flow-sheet of processing**

There is no flow-sheet as there would not be any processing.

d) **Quantity and type of chemicals to be used in processing**

As there will be no processing, use of chemicals in it will not be there.

e) **Quantity and type of chemicals to be stored**

Need of storing would not be there owing to no use of chemicals.

f) **Quantity of Water required for mining and processing and its source**

No water will be used in mining except for drinking (which will be obtained from the lessee's reservoir of filtered water), and there will be no processing. Hence, no need of identification of source for such water.

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11.0 ENVIRONMENT MANAGEMENT PLAN

A) **Baseline information with regard to**:-

Existing land use pattern

Sl. No.	Area already degraded due to	Area (hactare)
1	Quarrying/pitting	94.07
2	Dumping & Mineral storage	52.76
3	Roads	33.79
4	Processing Plant	33.76
5	Work-shop	nil
6	Township	200.00
7	Slime pond	52.00
8	Railway	57.00
8	Safety Zone	33.63
9	Area to be surrendered	200.38
10	Unutilised	1029.35
	Total	1786.74

Processing plant and Slime Pond, mentioned at serial nos. 4 and 7, in the above table, are for the Co.'s iron ore mine in the adjoining lease. Those are sited in this lease area as adequate and suitable land was not available in the other (5.10 sq miles) lease.

Water Regime

Most of the lease-hold is lateritic terrain (occasionally conglomeratic or shale-phyllitic) and has no definite ground water horizon. Neither any aquifer condition exists. The nalas of Limtur, Panposh and Jhikaria, all on West bank of the Karo flow East wards to meet the river, while the Champua nala on the East bank flows West ward to meet the river. Flow directions of the said nalas manifest the drainage pattern.

Flora and Fauna

Flora : Forest in this area is tropophilous. 'SAL' is the preponderant species with adequate natural regeneration. Other species are, Sidha, Asan, Dhamra, Bija, Gamhar etc. The prominent species outside RF are, Kusum, Mahua, Neem, Simul, Chatian. Forest density varies between 0.2 to 0.4.

Fauna : Besides elephants, there used to be Sambhars, barking deers, wild boars, bears, monkeys and various scavenging animals like jackals. A variety of birds like parrots, wag tails, pigeons, pea fowls and jungle fowls were seen.

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Quality of air, water & noise

Both air and water on the West bank reportedly were unpolluted as there was neither any industrial or mining activity. Mining in the lessee's iron ore lease just began in 1970 and in the initial years did not affect the air quality or the water regime. Again till the aforesaid mining began only noise was chirping of birds in the trees. Ambient noise level was almost well below minimum permitted. Effluent discharge by the Kalinga Iron Works (KIW), on the East bank, was small in quantity and was let out after treatment. Its emission of smoke in the air was also negligible.

Climate condition

Climate of the region was dry and semi-continental. Mornings of January and December used to be bitterly cold with occasional frosting, while the months of May and June till rains broke in, quite hot. Rains brought down temperature appreciably. Most of rains fell between mid-June and mid-October.

Human Settlements

Population of the E-bank [little over 30000 (#)] was higher because of situation of Barbil town and the residential colony of Kalinga Iron Works. Besides, there were villages of Kol-Barapada, Champua-sahi and Matkambeda (part occupied by KIW). Original population of the W-bank [less than 3000 (#)] consisted of residents of the three villages of Bolani, Balagoda and Limtur. The staff colony of the Bolani Ores Mines started getting residents from early sixtees. Majority of the villagers was tribal who usually engaged themselves in farming, as agricultural labour, in hunting and collecting forest material. Small groups took to mining and allied jobs like loading trucks and wagons.

(#) = According to 1961 Census

Public Buildings, Places & Monuments

There were no monument in this lease-hold. Only the Railway buildings like Station Master's offices etc., at Barbil and Bolani Khadan stations, built in late Fiftees, could be called as public buildings. Balagoda village had a Siva Temple built in the early Sixtees.

Does the area falls under notified area under Water Act, 1974

Yes, it does.

The Environment Management Plan, Drg No. MP/MN/ 14, attached shows the locations of the sampling stations.

b) **Environmental Impact Assessment Statement**

i) **Land area likely to be degraded due to**:

Quarrying/Pitting	Negligible, as the scale of work will be small and much of the work will be at the site already excavated	3.5 Hec
Dumping	Land degraded earlier will be used for extension of Tailing Pond	45.30 Hec
Roads	Almost nil, because no new road will be made as existing ones will suffice	
Workshop	Nil, for there will be no workshop	
Processing Plant	Nil, for there will be no such plant	
Township	There will be extension of township	10.00 Hec

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ii) **Air quality**

The proposed small scale mining with attendant occasional drilling, blasting and trucking will not affect the air quality any noticeable bit..

iii) **Water Quality**

Proposed mining will not affect at any place in any manner ground water, any nala or river water.

iv) **Noise Level**

Drilling for a few hours/week followed by blasting of those holes will not raise noise level in the work zone to any noticeable extent..

v) **Vibration levels (due to blasting)**

It will be hardly noticeable.

vi) **Water regime**

There will be no impact on drainage pattern or the level of ground water table.

vii) **Socio-economic**

The impact will be beneficial, because of generation of employment in mining, ore grading, trucking of ore etc.

viii) **Historical monuments etc**

Question of impact will not arise as there is no such monument in this lease area.

c) **Environment Management Plan : Time bound actions**

Storage & Utilisation of top soil

As there is no top soil, there will neither be storage nor utilisation.

Year-wise reclamation of land

Year	Action site	Area (ha)	Quantity re-handled for back filling in Cu.M	Bottom level after back filling
2010-11	Qry. No.10	1.50	6000.00	470 M AMSL
2011-12	Qry. No.09	2.00	49000.00	447 M AMSL
2012-13	Qry. No.08	1.25	9,000	460 M AMSL
2013-14	Qry. No. 06	1.10	144000.00	475 M AMSL
2014-15	Qry.No. 05	1.00	114000.00	441 M AMSL
2015-30	Qry.No.1,2,&3	3.50	260000.00	486 M AMSL

Back filling of the worked out quarries mentioned above will be undertaken after confirmation thro' core drilling exhaustion of ore beneath. No such drilling however will be done in Qarry nos 1,2,3 and 9, which were closed down owing to proximity to village and the railway line.

Taking into consideration scattered locations of the pits, availability of the material for the back filling at the respective pit heads, and insufficient space for manouvering, machines required are 1 medium size wheel loader (bucket capacity around 3 M^3) and the dozer working only in daylight, one quarry at a time. For occasional levelling, a Grader will be fetched. The quantities mentioned in the table above point to intermittent (non-continuous) operation. Afforestation will follow back filling.

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Proposal for use of abandoned pits as water reservoir

There is no such proposal as there is no need of storing water thus.

Programme of Afforestation

Year	Action Site	No. of trees to be planted	Area (ha)
2010-11	Pit No.10+Old slime pond	8,750	3.50
2011-12	Pit No.09+Old slime pond	10,000	4.00
2012-13	Pit No.08+Old slime pond	8,125	3.25
2013-14	Old slime pond	5,000	2.00
2014-15	Old slime pond	5,000	2.00

Stabilisation and vegetation of dumps

Year	Action Site	No. of Trees to be planted*	Area (Hac)
2010-11	Old slime pond	5,000	2.00
2011-12	Old slime pond	5,000	2.00
2012-13	Old slime pond	5,000	2.00
2013-14	Old slime pond	5,000	2.00
2014-15	Old slime pond	5,000	2.00

* Included in the figures given in the preceding table

Material from old slime pond, pretty blue dusty and high in Fe-content, can be used for blending with high alumina-low iron fines lying in nearby old dumps for sale. To keep open this possibility only bushy plants will be used for afforestation of the slime pond.

Meanwhile it is contemplated to have a quick (in 6-7 months time) study done by the National Metallurgical Laboratory, Jamshedpur, on prospect of metallurgical or any other economical use of this slime.

Measures to control erosion/sedimentation

Proposed mining work in next 5 years or there after is not going to cause any erosion or sedimentation of any nala or river channels. However, steps like garland drains, will be taken to arrest wash off at times of heavy rain that may obstruct flow in drainage channels in the vicinity.

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Treatment & disposal of water from mine

Water built up in the pits at times of heavy will get dissipated in no time and there will be no accumulation. Hence, no proposal for treatment and disposal is made.

Measures for minimising adverse effects on water regime

Mining in the pits of quarry No. 5 will remain much above local ground water table and, therefore, is not likely to affect it. Nor there is any toxic substance in the excavated material which getting dissolved can percolate down and pollute ground water. However, steps like garland drains, will be taken so that wash off from the dumps does not obstruct flows in natural drainage channels in the vicinity.

Protective measures for ground vibrations from blasting

Proper stemming of the holes, use of millisecond delay detonators and avoidance of collar priming will be practised to minimise ground vibration during blasting.

Protective measures for historical monuments & human settlements

No protective measure is thought of as there is no historical monument in the area, and villages are quite away to be affected by occasional small hole blasting.

Stabilisation and vegetation of dumps

As there is good scope of utilising the dumps around the pits fully for back filling, and that work can commence in near future (just after making sure - by core drilling - that there is no ore left in the pit) vegetation of the dumps may not be advisable. Instead it should be of the back filled areas (biological reclamation) to ensure no wash down during heavy rains.

Measures for controlling air pollution

Dust suppression measures like spraying water on roads when dumper movement takes place in the quarries and use of dust collectors in blast hole drills will be practiced.

Socio-economic benefits

The resumption of mining will be considerable socio-economic benefit, as there will be scope of employment directly in mining and ore dressing, indirectly in ore transportation and in operating drills and other mining machinery. Welfare measures, specially training of workmen will make them acquire skills, make aware of dangers in vocation. Workmen will enjoy health care facilities.

Monitoring

The Environment Cell of BOM monitors regularly qualities of air, water and noise and takes prompt remedial steps whenever there is breach of prescribed limits.

Dilip Kumar Basu Bose

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PROGRESSIVE MINE CLOSURE PLAN

(As per Rule 23 B of MCDR 1988)

For

Bolani Mn & Iron Ores Mine

(6.90 Sq.Miles ML in Keonjhar District, Orissa)

Of

Steel Authority of India Limited
Raw Materials Division

Prepared by

DILIP KUMAR (BASU) BOSE
Regd no : RQP/CAL/098/88/A
11/A Akshay Dutta Lane,
Calcutta -700006

July , 2010

स्टील अथॉरिटी ऑफ इण्डिया लिमिटेड
STEEL AUTHORITY OF INDIA LIMITED
रॉ मेटेरियल्स डिवीज़न
RAW MATERIALS DIVISION

भारतीय खान ब्यूरो, भुवनेश्वर
INDIAN BUREAU OF MINES, BHUBANESWAR
GOVT. OF INDIA

CERTIFICATE

The Progressive Mine Closure Plan of Bolani Manganese & Iron Mine over an area of 1586.36 hectares, which has been prepared by RQP Sri Dilip Kumar Bose (RQP Regn. No. RQP/CAL/098/88A), complies all statutory rules, regulations, orders made by the central or state government, statutory organizations, court etc., which have been taken into consideration and wherever any specific permission is required, the lessee will approach the concerned authorities.

I, also give an undertaking to the effect that all measures proposed in this closure plan will be implemented in a time bound manner as proposed.

Signature of the applicant (In full)

Name in block letters: S.N.SINGH

Date: 30.06.10
Place: Rourkela

Address: MANAGING DIRECTOR (RSP) & I/c RMD

AND

NOMINATED OWNER OF THE MINES
STEEL AUTHORITY OF INDIA LIMITED
ROURKELA STEEL PLANT
ROURKELA-769011 (ORISSA)

एस. एन. सिंह / S. N. SINGH
MD (RSP & I/C RMD)
RSP

PROGRESSIVE MINE CLOSURE PLAN (PMCP)

*As this PMCP is prepared simultaneously with the **Mining Plan (MP)** for the period 2010-15 few information are common. In the PMCP instead of repeating those, reference is made to the preceding MP.*

P.1 INTRODUCTION

Name of the lessee	-	Vide para 1 (a) of MP
Location of lease area	-	Vide para 2 (a) of MP
Extent of lease area	-	Vide para 2 (a) of MP
Type of lease area	-	Forest land - 506.14 ha Non-forest land - 1080.22 ha
Present land use pattern	-	Vide Para 11 (a) of MP
Method of Mining	-	Vide para 4 (a) of MP.
Mode of Ore Processing	-	Vide para 4(a) & 10 (a) of MP.

P.1.1 Reasons for closure

Exhaustion of reserve of economically viable ore, when that happens.

P.1.2 Statutory obligations

None till now

P.1.3 Closure Plan preparation

The present progressive closure plan is prepared by the same RQP (details at para 1(e) of MP) who has prepared the Mining Plan for 2010-15. Executing agency will be decided when necessary.

P.2 MINE DESCRIPTION

P.2.1	Geology	-	Vide para 3 (a) of MP
P.2.2	Reserves	-	Vide Para 3 (e) of MP
P.2.3	Mining Method	-	Vide Para 4 (a) of MP
	Mineral Beneficiation	-	Vide para 10 (a) of MP

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P.3 **REVIEW OF IMPLEMENTATION OF SCHEME OF MINING INCLUDING PMCP UP TO FINAL CLOSURE OF THE MINE**

No Mining Plan or Scheme of Mining was prepared for this lease since the Mining Plan approved on 21.02.1992.

Nor was there any mining too in this lease since 1977 to disturb the environment like degradation of land, removal of forest growth, pollution of surface or ground water, ambient air quality, noise level, ground through vibration or impact socio-economic condition.

Mention is to be made of the discharge of tailings of iron ore washing in the lessee's mine in the adjacent lease, into the Tailing Pond situated in this lease. Analysis of these tailings has not found any contaminating content in it. Hence, there has been no contamination of surface or ground water. Quantum of un-dissolved solids in the overflow from the Pond is found to be within permissible limits (vide Analysis Report, Anx. 3)

As no Progressive Closure Plan of this mine has been prepared ever, no progress report about its implementation can be made.

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P.4 CLOSURE PLAN

P.4.1 Mined out land

The yield of manganese ore being less than 10% of total excavated rocks, overburden and host taken together, and pits often being small and shallow, filling up and restoration of topography can be feasible. Pit nos. 1, 2 and 3 (near old Fines Washing Plant and Fines Loading Plant) have already been filled up. Pit Nos 6, 8, 9 and 10 are also scheduled to be filled up. Trees will be planted on the filled up ground. Filling up of the pits in quarries Nos., 5,4 & 7 will go on more or less simultaneously with mining as stated in the table below, followed by plantation.

Year	Pit No.	Mined out area at the beginning of the year (In Hect)	Additional area proposed during the year (In Hect)	Total area (In Hect)	Area Reclaimed & Rehabilitated during the year (In Hect)	Mined out area at the end of the year In Hect
		A	B	C=A+B	D	C-D
2010-11	5	0.98	0.33	1.31	nil	1.31
2011-12	5	1.31	0.22	1.53	nil	1.53
2012-13	5	1.53	0.14	1.66	0.5	1.16
2013-14	5	1.16	0.23	1.38	0.5	0.88
2014-15	5	0.88	0.26	1.14	0.5	0.64
2014-15	5,4, &7	3.64	3.25	6.89	6.89	nil

P.4.2 Water quality Management

Of the three perennial nalas of Jhikaria, Panposh and Limtur on West bank, only the last named has on its southern bank the waste dump of the pit No. 7. The water level in the nala rising at times of heavy rain touches the toe of the said waste dump. Because of no mining in the pit for nearly 30-years, the existing dump got stabilized through abundant growth of weeds all over it and chance of the dump getting washed down into the nala flow is remote. Pit no. 10, is on the bank of the river Karo. It is a small shallow pit with no mining activity in last 30 years. Moreover, its waste dump is away from the river bank. Hence, there is very little possibility of this waste getting into the river water. No other pit or waste dump is located close to any of the nalas or the river as to pollute respective water flows. As mentioned in para P.3 above, tailings in the Tailing Pond have no toxic content to contaminate surface or ground water.

None of the mining and allied activities proposed will cause any erosion - sedimentation or diversion of the nala courses or chemical contamination of any type in water. Latest study of water quality by the State PCD, Orissa, found all contents within permissible limits (**Anx.-3**)

All the dumps in this lease are small and barely 2-3m high. Future dumps are unlikely to be any larger. None of the dumps in last 30 years had any breach calling for digging garland drains or construction of check dams. Mining in future will also

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All the dumps in this lease are small and barely 2-3m high. Future dumps are unlikely to be any larger. None of the dumps in last 30 years had any breach calling for digging garland drains or construction of check dams. Mining in future will also not have any dump taller than 2-2.5m, and none will be on sloping ground to fear collapse in rain, requiring construction check dam.

However, garland drains are dug and check dams built for the two large dumps of iron ore fines located across western lease boundary between the wagon loading plant and the old Slime Pond. There has been no additions in the last 15 years, but reclamation taken place from the toes. Details of the drain and check dams are given in Table 'A'.

Rain water discharge

Mining excavations past or proposed are small and never interfered with prevailing natural ground slopes as to affect rain water discharge in any manner. Rain fall all over the mining areas flowed in existing channel to the nalas named above going ultimately to the river Karo.

As mentioned earlier quality of water is monitored regularly. Corrective actions for breaches whenever noticed are taken without delay.

Report of Hydrological Study

M/s Water & Power Consultancy Services (I) Pvt Ltd, New Delhi, made a study of water resources of the region which includes the lease under report. A copy of it is placed at Anx. 2 .
In the proposed mining of manganese as well as iron ore there will be no use of water (except a small quantity for drinking). There is no possibility of acid mine drainage from mining of any of the two ores, and therefore, no proposal for treatment of such polluted water.

Water Balance

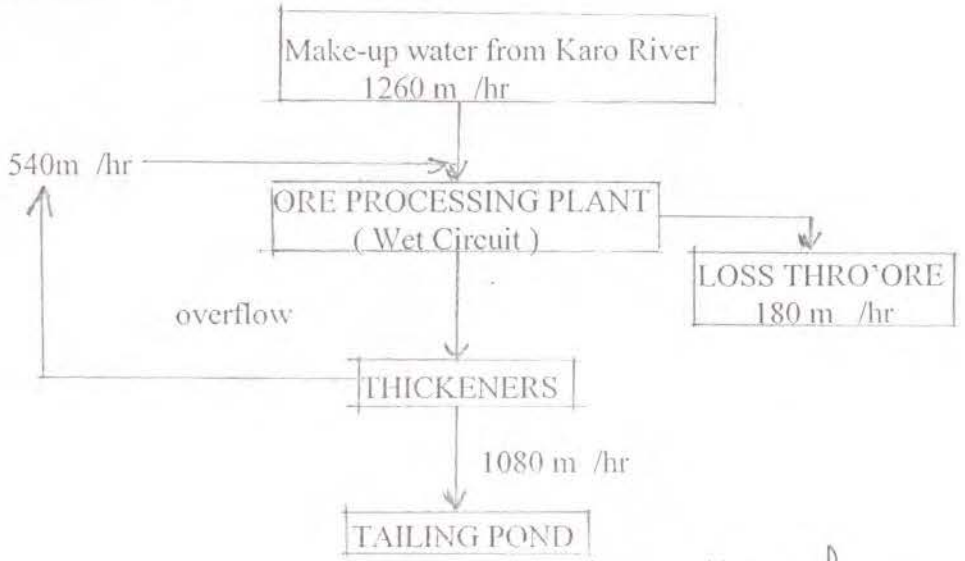

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Table A

DETAILS OF PROPOSED CHECK DAMS INSIDE 6.90 SQ MILES ML

Year	Location	Name of Check dam	Particulars of construction	Size (Total L X B X H) (m)	Water quality monitoring
2010-11	Nallah originating in Panposh dump area on the hospital side of the before entering Township (i.e Balagoda Nallah)	CD-B-2	Earthen / dry stone masonary with spill-way system	L= 60 m H= 1.5 m Top width= 1.5m Bottom width=3m	do
	Nallah near main gate, leading to back side of fuel pump area	CD-MG -1	Earthen / dry stone masonary with spill-way system	L= 250 m H= 1.5 m Top width= 1.5m Bottom width=3m	-do-
2011-12	Nallah originating from Panposh Mining Area behind the Office complex	CD-P-2	Earthen / dry stone masonary with spill-way system	L= 80 m H= 1.5 m Top width= 1.5m Bottom width=3m	-do-
	Balagoda Nallah beyond township in downstream side	CD-B-2	Earthen / dry stone masonary with spill-way system	L= 50m H= 1.5 m Top width= 1.5m Bottom width=3m	-do-
2012-13	Panposh Nallah beyond road culvert and railway lines	CD-P-2 i	Earthen / dry stone masonary with spill-way system	L= 30 m H= 1.5 m Top width= 1.5m Bottom width=3m	-do-
	Nallah emerging from old fines dump area near Balagoda Village	CD-FD -1	Earthen / dry stone masonary with spill-way system	L= 50 m H= 1.5 m Top width= 1.5m Bottom width=3m	
2013-14	Jhikaria Nallah near old Mn-quarry & CISF Complex	CD-J-1	Earthen / dry stone masonary with spill-way system	L= 30 m H= 1.5 m Top width= 1.5m Bottom width=3m	-do-
	Nallah emerging from old fines dump & Loading plant area	CD-LD -1	Earthen / dry stone masonary with spill-way system	L= 50 m H= 1.5 m Top width= 1.5m Bottom width=3m	
2014-15	Nallah near oxidation pond area	CD-OP-1	Earthen / dry stone masonary with spill-way system	L= 15 m H= 1.5 m Top width= 1.5m Bottom width=3m	-do-
	Nallah emerging from Bolani Village & CISF complex area	CD-B -1	Earthen / dry stone masonary with spill-way system	L= 50 m H= 1.5 m, Top width= 1.5m,Bottom width=3m	

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P.4.3 **Air Quality Management**

None of the contents of air at present is beyond permissible limits. This status is not going to be affected in any way because of the proposed resumption of mining. Therefore, no preventive measure is contemplated.

P.4.4 **Waste Management**

The nature, quality and quantity of waste as well as mode of dumping has been described in para 7 of the preceding MP. Waste will be used in filling up of the pits upon exhaustion of ore. To arrest wash off from dumps during heavy rains there are and will be boulder walls all round the dumps. No hazardous or toxic material – leaching of which can pollute water – exists in this waste and hence no plan for prevention.

Year	DumpNo.	Nature of Dump	Area at the beginning of the year (inHac)	Additional Area during the year (inHac)	Area rehabilated during the year (inHac)	Balance area at the end of the year (inHac)
2010-11	Near No.5 Quarry	O/b & intercalation waste	0.2	0.44	nil	0.64
2011-12	Near No.5 Quarry	O/b & intercalation waste	0.64	0.44	nil	1.07
2012-13	Near No.5 Quarry	O/b & intercalation waste	1.07	0.44	0.54	0.97
2013-14	Near No.5 Quarry	O/b & intercalation waste	0.97	0.44	0.5	0.91
2014-15	Near No.5 Quarry	O/b & intercalation waste	0.91	nil	0.5	0.41

During the year 14-15 back filling will be made by excavated waste material.

Construction of retaining wall around toe of the dump will be made of about 260 M in length , width of the retaining wall will be 1.00 M and hight of 1.00 M from local ground level all along in the beginning year i.e 2010-11.

As the dump will be reclaimed from the 2nd year of resumption of mining , i.e 2011-12 the retaining wall made of boulder and temporary. It will go at the time of reclamation.

P.4.5 **Top Soil Management**

Because there is no top soil in the area proposed to be mined, no proposal for its management is needed.

Dilip Kumar Basu; Bose

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Table 'B'

CONSTRUCTION OF RETAINING WALL

Year	Location	Name / Ref no of Retaining Wall	Particulars of construction	Size (LXBXH) (m)
2010-11	Around Loading plant stock pile eastern side	RW-LSP1-i	Stone masonary with batter with French holes	L= 100m H= 1.5 m Top width= 1.5m Bottom width=2.5m
2011-12	OB Dump/Panposh quarry in township side	RW-D1-i	Stone masonary with batter with French holes	L= 150m H= 1.5 m Top width= 1.5m Bottom width=2.5m
2012-13	Loading Plant Stockpile southern side	RW-LSP2	Stone masonary with batter with French holes	L= 100m H= 1.5 m Top width= 1.5m Bottom width=2.5m
2013-14	(i) OB Dump of Quarry-5	RW-P1-i	Stone masonary with batter with French holes	L= 150m H= 1.5 m Top width= 1.5m Bottom width=2.5m
2014-15	OB dump near D-area (Extension of existing wall)	RW-D2	Stone masonary with batter with French holes	L= 200 m H= 1.5 m Top width= 1.5m Bottom width=3m

Dilip Kumar Basu Ross

P.4.6 **Tailing dam management**

Protection of tailing ponds require on one hand sturdy construction of the embankments, and on the other, prevention of on rush of water during heavy rain. From the design of the Dam [Drg No. MP/MN/15] safety in construction seems adequate. Drains on the N-end will divert on rush of water in rains. Analysis of water from effluent streams and seepage from the pond did not find any content failing standards prescribed in the Environment (Protection) Act, 1988.

Silt from the pond will be used for raising height of the embankments (to enhance capacity and thus life of the pond). The clear water overflow from the dam has suspended solids well within permissible limits. Upon analysis the effluents found to be not containing any toxic substance to contaminate water. When filled up, the pond will be rehabilitated through afforestation.

P.4.7 **Infrastructure**

Barring un-metalled roads no other infrastructure exists or will come up in the mining areas. The roads will be left out after closure of the mine for use by the local villagers.

P.4.8 **Disposal of mining machinery**

This mine will never have any mining machine of its own. Hence, question of disposal will not arise.

P.4.9 **Safety & Security**

Upon closure of the mine all pits wil be filled up with waste dump material. Hence, nothing will be left unsafe. Again, as no plant or machine will be there in the mine, need for security will also not arise. However, the last phase of plantation will be guarded till roots entrench firmly. .

P.4.10 **Disaster management & risk assessment**

Possibility of disaster can only be from the Tailing Pond, measures to prevent which has been stated in para P.4.6 above.

P.4.11 **Care & Maintenance during temporary discontinuance**

As there will be no plant or machinery installed in the mine, specific care for maintenance will not be required. To prevent unauthorized entry into the pits fencing will be given.

Dilip Kumar Basu

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P.5 ECONOMIC REPERCUSSIONS

P.5.1 Status of local residents employed

Most of the hand miners as well as dressers employed earlier were local tribal people. It was found they had some aptitude in mining manganese ore. If employed, these persons at the time of schedule closure, some 20 years hence, will superannuate and earn sufficient compensation not to suffer economic hardship. Others because of rich experience will find jobs easily and as a result will not suffer economically.

P.5.2 Compensation to be given

It will be given in accordance with prevailing statutory norms.

P.5.3 Satellite occupation

Barring loading/unloading of trucks present mining will not offer any attendant (satellite) job. Scope of such jobs will be aplenty in the region. Closure of this mine is unlikely to pose any problem to people engaged in such jobs.

P.5.4 Continued engagement of employees

Scope is likely to be absent as the lessee's other mines are mechanized and not manual.

P.5.5 Envisaged repercussions on the expectation of the society

The type and scale of the proposed mining is unlikely to generate high hopes in the society. Its closure, therefore, will be accepted in stride without disappointment or dismay.

P.6 TIME SCHEDULING FOR ABANDONMENT

As this will be a manually worked mine without setting up of a plant or installation of machinery, abandonment will involve withdrawal of miners and dressers no sooner all available ore is extracted, and filling up of the pit (last worked) with waste material. For that a fortnight is sufficient. But planting trees on the filled up ground and their nurturing till roots entrench firmly will take 15-16 months. To be on safe side, total time should be taken as 18-months as per break-up given below: (Vide Table 'C' also).

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TIME SCHEDULE (tentative) FOR FINAL CLOSURE

	JOB/SECTOR	ACTION	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15	Month 16	Month 17	Month 18
1	**Mined out land**	**Rehabilitation**																		
		I)Filling up																		
		ii)Planting of sapling					M	O	N	I	T	O	R	I	N	G				
		iii) Nurturing (Watering, Mannuring, guarding)																		
2	**Waste Dump**	None																		
3	**Safety & Security**	Guarding																		

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Registration No. MQP/CAL/098/88/A

GOVT. OF INDIA ★ INDIAN BUREAU OF MINES ★ BHUBANESWAR

Sector	Action	Time period (Months)
Mined out land	i) Filling up	½ (0.5)
	ii) Planting saplings	1 ½ (1.5)
	iii) Nurturing (watering, manuring, guarding)	16
Waste Dumps	None, for all material will be used up in filling	
Safety and Security	Guarding from planting till roots entrench firmly	Common with above

P.7 **ABANDONMENT COST**

Computed in the prescribed manner, the net area for which Financial Assurance (FA) is to be provided, as required by Rule 23F of the MCDR, 1988, is 553.07ha, details given in the Table below. The FA @ Rs. 25,000/- per ha, works out to Rs. 1,38,26,750/- (Rupees one crore thirty eight lakhs twenty six thousand seven hundred fifty only). Bank guarantee for this sum will be furnished upon approval of the computation by IBM.

Dilip Kumar Basu Bose

Dilip Kumar Basu Bose
Registration No. RQ/CAL/008/88/-

Year wise proposal for rehabilitation and environment monitoring

Table - 'C'

Item	Details	Area (Ha) Proposed	Quantity Proposed (m^3)	Expenditure Proposed (Rs)	NOTE				Expenditure (Rs.)
					Year	Locale	Area (Ha)	Quantity (M^3)	
(A) Reclamation & Rehabilitation of Mined out area	(i) Back filling	6.85	131,000	Rs.19.65 lakhs	2010-11 2011-12 2012-13 2013-14 2014-15	Q6	0.85 1.50 1.50 1.50 1.50	16250 28700 28700 28700 28700	2.44 lacs 4.30 lacs 4.30 lacs 4.30 lacs 4.30 lacs
	(ii) Afforestation of backfilled area	0.85	17125 nos	Rs.256875/-	2010-11 2011-12 2012-13 2013-14 2014-15			2125 trees 3750 trees 3750 trees 3750 trees 3750 trees	Rs.31875.00 Rs.56250.00 Rs.56250.00 Rs.56250.00 Rs.56250.00
	(iii) Others specify	nil	nil	nil	-	-	-	-	-
	(iv) Pisciculture	nil	nil	nil	-	-	-	-	-
	(v) Converting into water reservoir	nil	nil	nil	-	-	-	-	-
	(vi) Picnic spot	nil	nil	nil	-	-	-	-	-
(B) Stabilisation & Rehabilitation of Dumps (within lease)	(i) Terracing	Scope does not exist for any of these . Because all dumped materials will be used for back filling							
	(ii) Pitching								
	(iii) Construction of parapet wall/ retaining walls at toe of dumps								
	(iv) Construction of check dams along slope of vallies								
	(v) Construction of settling ponds (garland drains etc.)								
	(vi) Desilting of ponds, channels								
	(vii) Afforestation on dumps	10.00 2.30	25000 nos trees 5057 nos trees	Rs.375,000 Rs.86250	2010-11 2011-12 2012-13 2013-14 2014-15 2014-15	Old Tailing Pond -do- -do- -do- -do- Q5	2.00 2.00 2.00 2.00 2.00 2.30	5000 trees 5000 trees 5000 trees 5000 trees 5000 trees 5057 trees	75 000 75 000 75 000 75 000 75 000 86 250
	(viii) Others to specify	-	-	-	-	-	-	-	-
(C) Rehabilitation of barren area within lease	(i) Afforestation (Green belt)	15.00	37500 nos trees	Rs.562500					
	(ii) Others to specify	nil	nil	nil					

Dilip Kumar Basu Bose
Registration No EQ /CAL/098/88/A

INDIAN BUREAU OF MINES, GOVT. OF INDIA, BHUBANESWAR

Contd.

Table 6

D. ENVIRONMENTAL MONITORING (CORE ZONE & BUFFER ZONE)					
	Details	No. of Sampling station proposed/year	No. of 24-hrs representative samples proposed/yr	Expenditure Rs.lakh/year	Remarks
(D) Environment Monitoring	(i) Ambient Air Quality	4 nos.	16	1.50	
	(ii) Water quality	4 nos	16	0.50	
	(iii) Noise level survey	4 nos	16	0.25	
	(iv) Ground vibration			5.00	
	(v) Others (to specify)	Nil	Nil	Nil	

Dilip Kumar Basu Bose
Registration No. EQ/CAL/098/88.

INDIAN BUREAU OF MINES, GOVT. OF INDIA, BHUBANESWAR

43 d

P.8 FINANCIAL ASSURANCE

TABLE : BREAK-UP OF AREAS IN THE MINING LEASE FOR CALCULATION OF FINANCIAL ASSURANCE [Drg. No. MP/MN/14]

Sl. No.	Head	Area put on use at start of Plan (Ha)	Additional requirement during Mining Plan period (Ha)	Total (Ha)	Area Considered as fully Reclaimed and Rehabilitated (Ha)	Net area considered for Calculation (Ha)
1	AREA UNDER MINING	94.07	1.15	95.22	0.00	95.22
2	STORAGE FOR TOP SOIL	0.00	0.00	0.00	0.00	nil
3	OVERBURDEN /DUMP (including Old Tailing Pond)	13.76	2.30	16.06	0.00	16.06
4	MINERAL STORAGE	39.00	1.50	40.50	0.00	40.50
5	INFRASTRUCTURE (WORKSHOP, ADMN BLDG ETC.)	2.50	0.00	2.50	0.00	2.50
6	ROADS & CONVEYORS	33.79	0.00	33.79	nil	33.79
7	RAILWAY	57.00	0.00	57.00	0.00	57.00
8	GREEN BELT & PROHIBITED ZONE	33.63	0.00	33.63	33.63	0.00
9	TAILING POND	52.00	43.00	95.00	0.00	95.00
10	EFFLUENT TREATMENT PLANT	1.00	0.00	1.00	0.00	1.00
11	EXPLORATION	0.00	0.00	0.00	0.00	0.00
12	MINERAL SEPARATION PLANT	1.00	0.00	1.00	0.00	1.00
13	TOWNSHIP AREA	200.00	10.00	210.00	0.00	210.00
14	OTHERS (MAGAZINE)	1.00	0.00	1.00	nil	1.00
15	GRAND TOTAL	528.75	57.95	586.70	33.63	553.07

Note:-

1. During the current mining plan period ie, 2010-2014 the working will be made over quarry no 5 for which only 1.15 h of land will be additional requirement . The total land already degraded for mining purposes is 94.07 out of which 6.85 h will be reclaimed during the period from 2010-2014.

2. Additional requirement of dump is 2.30 h (1.80 h for waste dumping & 0.50 h for sub grade minerals) and the area under reclamation during the period is 12.30 h (2.30 h over dump & 10.00 h over old tailing pond not in use)

3. Green belt & Town ship area is considered as reclaimed area as there will no degradation of land.

Dilip Kumar Basu Bose

Dilip Kumar Basu Bose
Registration No HQ/CAL/098/88/A

P.9 **Certificates** : The necessary certificates are enclosed.

P.10 **Plans , sections etc.** : The plans showing location and area of the lease , forest non-forest areas, river, nalas, human settlements, Tailing Pond and other surface features including mining pits with waste dumps, geological map and sections are enclosed.

Satellite image ordered for the lessee's 5.10 sq. Miles ML covers this area too. It will be submitted no sooner received.

Dilip Kumar Basu Bose

Dilip Kumar Basu Bose
Registration No. EQP/CAL/098/88/A

अनुमोदित
APPROVED
6/8/2010
क्षेत्रीय खान नियंत्रक
REGIONAL CONTROLLER OF MINES
भारतीय खान ब्यूरो
INDIN BUREAU OF MINES
भुबनेश्वर/BHUBANESWAR

Phone Nos. (0674) 2744430/ 2742463
Fax No. (0674) 2744430
E- mail: ibmbbsr@dataone.in

भारत सरकार
खान मंत्रालय
भारतीय खान ब्यूरो
क्षेत्रीय खान नियंत्रक का कार्यालय

No. FMCP/ OTF. MEXH/03-ORI/ BHU/ 2010-11

महानी काम्प्लेक्स, दूसरी मंजिल
308, डिस्ट्रिक सेन्टरए चंद्रशेखरपुर
भुवनेश्वर–751016

दिनांक / Date: 05.08.2010

To

M/s Steel Authority of India limited
Raw Materials Division
Industry House, 10 Camac Street
Kolkata – 700 017

Sub. Approval of Final Mine Closure Plan for Bolani Iron Ore Mine, over part surrendered area of 200.38 ha, in Keonjhar district of Orissa state, submitted by M/s Steel Authority of India Limited under Rule 23 C of MCDR, 1988.

Ref. 1. Your RQP letter No. Nil dated 19.04.2010.
2. This office letter of even number dated 17.06.2010.
3. Your RQP letter No. Nil dated 14.07.2010.

Sir,

In exercise of the power conferred by the sub-Rule 2 of Rule 23 C of Mineral Conservation and Development Rules, 1988, I hereby **APPROVE** the above said Final Mine Closure Plan in respect of your **Bolani Iron Ore Mine, over part surrendered area of 200.38 ha, in Keonjhar district of Orissa state, submitted by M/s Steel Authority of India Limited under Rule 23 C of MCDR, 1988**. This approval is subject to the following conditions:

(i) That the Final Mine Closure Plan is approved without prejudice to any other laws applicable to the mine/ area from time to time whether made by the Central Government, State Government or any other authority.

(ii) That this approval of the Final Mine Closure Plan 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) That this Final Mine Closure Plan is approved without prejudice to any order or direction from any court of competent jurisdiction.

(iv) That the Regional Office, Indian Bureau of Mines, Bhubaneswar shall be informed after completion of activities of final mine closure as per proposal of the Final Mine Closure Plan.

Yours faithfully,

Encl: One copy of approved Final Mine Closure Plan.

(S. TIU)
Regional Controller of Mines

Copy for kind information to:

1. Shri Dilip Kumar Basu (Bose), RQP, Brojo-Dham, 11/ A, Akshay Dutta Lane, Kolkata – 700 006.
2. The Director of Mines Safety, Directorate General of Mines Safety, Chaibasa Region, At & Post Chaibasa, District – Singhbhum West along with one copy of approved Final Mine Closure Plan 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 approved Final Mine Closure Plan by REGISTERED PARCEL.

5/8/2010

(S. TIU)
Regional Controller of Mines

BROJO-DHAM
11/A, Akshay Dutta Lane,
Calcutta - 700 006
Phone : (033) 2530 8200
e-mail : dkbbolani@yahoo.com

14th July, 2010.

The Regional Controller of Mines,
Indian Bureau of Mines,
Mahani Complex - 2nd floor,
308, District Centre,
Chandrasekharpur,
Bhubaneswar 751 016.

Dear Sir,

Sub. Approval of Final Mine Closure Plan for Bolani (Mn &) Iron ore Mine over part surrendered area of 200.38 ha, in Keonjhar District of Orissa state, submitted by m/s Steel Authority of India Ltd. under Rule 23C of MCDR, 1988.

Reference your letter no.FMCP/OTF.MEXH/03-ORI/BHU/2010-11, dated 17.06.2010 (copy kept in the folder) I beg to submit herewith the aforementioned Final Mine Closure Plan (FMCP).

2. This FMCP has been modified in accordance with your scrutiny remarks and directives.

3. The FMCP is submitted in five (5) copies. The text, annexures, photographs, plans, one CD, your scrutiny remarks and our responses thereto, certificates, particulars of the nominated owner and the Directors - all are kept in one and the same folder.

4. I shall be grateful if you kindly accord approval early.

Thanking you,

Encl. 5-copies of the FMCP

Yours faithfully,

Dilip Kumar Basu, Bose
Registration No. RQP/CAL/093/86/-

copy to The GM.
SAIL - RMD - Bolani Ores Mines.
Bolani.

19th April, 2010.

BROJO-DHAM
11/A, Akshay Dutta Lane,
Calcutta - 700 006
Phone : (033) 2530 8200
e-mail : dkbbolani@yahoo.com

The Regional Controller of Mines,
Indian Bureau of Mines,
Mahani Complex - 2nd floor,
308, District Centre,
Chandrasekharpur,
Bhubaneswar 751 056.

Dear Sir,

Final Closure Plan (FCP)
for 200.3 ha of forest land
within 6.90 sq miles Mining
Lease of SAIL-Bolani Ores Mines
in Keonjhar Dist., Orissa.

I beg to submit the above for your scrutiny and kind approval.

2. This FCP is prepared in response to your scrutiny remarks - Plate/Para 3 - on the Mining Plan (MP) and PMCP for the aforementioned Mining Lease (received in June & Dec. 2009) - submitted on 21.11.2009, vide copy attached.

Log letter

3. This FCP has been prepared following the Guidelines issued by IBM (no.0-11011/1/2001-CCOM, dt.8.8.03) and is in accordance with discussion we had with Shri D Dash, Mining Geologist, in your office on 25.02.2010.

4. The text, annexures, one plan, photographs and the certificates - all are kept in one folder.

5. As the approval of this FCP together with that of the MP and PMCP will facilitate grant of renewal of the concerned lease, I humbly request you to kindly accord it early.

Thanking you,

Encl.

Yours faithfully,

Dilip Kumar Bose.

Dilip Kumar Bose
Registration No. AQ-/CAL/093/98/A

Phone Nos. (0674) 2744430/2742461
Fax No. (0674) 2744430
E- mail: ibmbbsr@dataone.in

भारत सरकार
खान मंत्रालय
भारतीय खान ब्यूरो
क्षेत्रीय खान नियंत्रक का कार्यालय

No. FMCP/ OTF. MEXH/03-ORI/ BHU/ 2010-11

महानी काम्प्लेक्स, दूसरी मंजिल
308, डिस्ट्रिक सेन्टरए चंद्रशेखरपुर
भुवनेश्वर–751016
दिनांक / Date: 17.06.2010

To

M/s Steel Authority of India limited
Raw Materials Division
Industry House, 10 Camac Street
Kolkata – 700 017

Sub. Approval of Final Mine Closure Plan for Bolani Iron Ore Mine, over part surrendered area of 200.38 ha, in Keonjhar district of Orissa state, submitted by M/s Steel Authority of India Limited under Rule 23 C of MCDR, 1988.

Ref. Your RQP letter No. Nil dated 19.04.2010.

Sir,

This has reference to the letter cited above on the subject. The draft Final Mine Closure Plan has been examined in this office and also carried out site inspection by Shri D. Dash, JMG, IBM, Bhubaneswar on 20.05.2010. The deficiencies observed are enclosed herewith as Annexure I.

You are therefore advised to carry out the necessary modifications in the draft final mine closure plan in the light of our comments vide Annexure I and submit in final five (5) bound copies of the final mine closure plan within 30 (thirty) days from the date of issue of this letter, for further necessary action.

It may be noted that no further extension of time in this regard will be entertained and the final mine closure plan will be considered for rejection if not submitted within above due date and the deficiencies are not attended completely.

भवदीय / yours faithfully,

Encl. As above.

17/6/2010

(एस. टियु/ S.TIU)
क्षेत्रीय खान नियंत्रक / Regional controller of Mines

Copy for kind information and further necessary action to Shri Dilip Kumar Basu (Bose), RQP, Brojo-Dham, 11/ A, Akshay Dutta Lane, Kolkata – 700 006.

(एस. टियु/ S.TIU)
क्षेत्रीय खान नियंत्रक / Regional controller of Mines

ANNEXURE

SCRUTINY REMARKS ON FINE MINE CLOSURE PLAN OF BOLANI IRON ORE MINE FOR PART SURRENDERED AREA OF 200.38 HA IN KEONJHAR DISTRICT ORISSA

1. A Copy of resolution of the Board of directors should be enclosed in Final Mine Closure Plan for such decision taken for FMCP. FMCP should be furnished in hard bound page manner. Pre submission scrutiny should not be enclosed in the document. . In para 1.3, name and address with telephone & fax number of nominated owner should be furnished. The list with address & telephone / fax number of Board of Directors should be furnished.
2. In the introduction, FMCP is supplement to Mining Plan and IBM asked for Final Mine Closure Plan etc should not be mentioned. Since this is not the reason for surrender of the area. Name of the lessee, details of the lease & surrender area and other relevant information should be furnished since Final Mine Closure Plan is a separate document.
3. In para 1.2, under statutory obligation, Rule under which FMCP is submitted should be mentioned.
4. In Para 2.1, general topography, geology of the surrendered area with detailed description of the litho units encountered in the area should be furnished. During field inspection, the area near the Forest Guest house was found to BHJ / BHQ with float Iron ore. The same should be reflected in Geological Plan of the area.
5. In para 4.2, general baseline information regarding water availability in the area and drainage pattern should be mentioned.
6. In para 4.7, present infrastructure facilities like roads connecting the area should be mentioned.
7. In para 8, format of financial assurance as per guideline should be furnished. In para 9, a undertaking by the lessee to implement the proposal in Final Mine Closure Plan in a time bound manner should be enclosed.
8. Key Plan, lease plan, Surface Plan, Surface Geology Plan, Environment Plan should be furnished.
10. A video film of about 5 minutes showing the general land use feature of the area should be enclosed.

17/6/200

(एस. टियु/ S.TIU)
क्षेत्रीय खान नियंत्रक / Regional controller of Mines

Response (& action) to the scrutiny remarks stated in the Annexure to the letter no.FMCP/OTF-MEXH/03-ORI/BHU/2010-11, dated 17.06.2010 of the RCOM, IBM, Bhubaneswar.

IBM Sl no.	Response/Action	Please vide
1.	Board resolution - copy furnished Hard cover - done Name & address of nom. owner - furnished - Do. - members of Board of Directors -furnished	Anx.2 Cert. & address section
2.	Name of the lessee, details of lease & area under surrender (u/s) - furnished	Page 1
3.	Rule under which FMCP submitted - mentioned	,, 2
4.	Topography, geology of area u/s - mentioned	,, 3
5.	Baseline information about water availability & drainage pattern - given	,, 4
6.	Present infrastructure facility - mentioned	,, 4
7.	Financial Assurance in prescribed format - furnished	,, 7
8.	Key plan - ,, Lease plan - ,, Surface plan - ,, Surface geological plan - ,, Environment plan - ,,	FCP/MN/1 FCP/MN/2 FCP/MN/3 FCP/MN/4 FCP/MN/5
10.	Video film (CD) - Enclosed	

Dilip Kumar Basu Bose

Dilip Kumar Basu Bose
Registration No. RQP/CAL/098/96/A

FINAL MINE CLOSURE PLAN

(As per Rule 23C of MCDR 1988)

FOR

200.38 ha of FOREST LAND

WITHIN

6.90 SQ. MILES MINING LEASE

अनुमोदित
APPROVED

OF

SAIL - BOLANI MANAGANEASE & IRON ORES MINE
IN KEONJHAR DISTRICT, ORISSA

Prepared by

DILIP KUMAR (BASU) BOSE
Regd. no : RQP/CAL/098/88/A

VIDE LETTER No. FMCP/OTF-MECH/03-ORI/BHU/2010-11

05.08.2010

Date of lease execution	-	14.11.1962
Period of lease	-	20 years from 14.11.1962
Date of expiry	-	13.11.1982
Category of mine	-	'A' Other than fully mechanised
Forest land	-	506.14 H*
Proposed period	-	20 years from Nov.2002
ML area in hectares	-	1786.74H - 200.38H* = 1586.36H
Proposed Financial year	-	1st. April 2010-31st March 2015

* Originally 706.52 H & surrendered 200.38H balance 506.14 H

July , 2010

C O N T E N T S

The CD is kept in the bag containing the Key Plan

Dilip Kumar Basu Bose

Dilip Kumar (Basu) Bose
Registration No. RQP/CAL/098/88/A

स्टील अथॉरिटी ऑफ इण्डिया लिमिटेड
STEEL AUTHORITY OF INDIA LIMITED
रॉ मेटेरियल्स डिवीज़न
RAW MATERIALS DIVISION

भारत सरकार
भारतीय खान ब्यूरो, भुवनेश्वर
INDIAN BUREAU OF MINES, BHUBANESWAR
GOVT. OF INDIA

CERTIFICATE

The Final Mine Closure Plan for Bolani Iron Ore Mine, over part surrendered area of 200.38 hectares, in Keonjhar district of Orissa State has been prepared under Rule 23 C of MCDR, 1988 by RQP Sri Dilip Kumar Bose (RQP Regn. No. RQP/CAL/098/88A), complies all statutory rules, regulations, orders made by the central or state government, statutory organizations, court etc., which have been taken into consideration and wherever any specific permission is required, the lessee will approach the concerned authorities.

I, also give an undertaking to the effect that all measures proposed in this closure plan will be implemented in a time bound manner as proposed.

Signature of the applicant (In full)

Name in block letters: S.N.SINGH

Date: 30.06.10
Place: Rourkela

Address: MANAGING DIRECTOR (RSP) & I/c RMD

AND

NOMINATED OWNER OF THE MINES
STEEL AUTHORITY OF INDIA LIMITED
ROURKELA STEEL PLANT
ROURKELA-769011 (ORISSA)

Particulars of the Nominated Owner

Name - S. N. SINGH

Designation - Managing Director, SAIL-Raurkela Steel Plant
& In-charge, SAIL-Raw Materials Division

Address - SAIL-RMD,
Industry House,
10, Camac Street,
Kolkata 700 017.

Telephone No. (033) 2282 2316

FAX No. - +91 - 33 - 2282 0422/5630

e-mail ID - rmdsail@gmail.com

Dilip Kumar Basu Bose

Dilip Kumar 'Basu' Bose
Registration No. IBQ/CAL/098/88/A

Particulars of the members of the Board of Directors of SAIL

Sl.	Name	Address & Phone No.	FAX
1.	Shri C S Verma, Chairman	Ispat Bhawan, Lodi Road, New Delhi 110 003	011 24367281 011 24367025
2.	Shri S Bhattacharya Director (Finance)	- Do. -	011 24369203
3.	Shri S S Ahmed Director (Commercial)	- Do. -	011 24365193
4.	Shri V K Gulhati Director (Technical)	- Do.-	011 24363358
5.	Shri B B Singh Director (Personnel)	- Do. -	011 24368097
6.	Shri V K Shrivastava Managing Director Bokaro Steel Plant	Bokaro Steel City, Jharkhand 827 001	06542 240300
7.	Shri S N Singh Managing Director, Rourkela Steel Plant	Rourkela, Orissa 769 011	0661 2510018
8.	Shri P K Bajaj Managing Director Durgapur Steel Plant	Durgapur W. Bengal 713 203	0343 2582460
9.	Shri G Elias Jt Secretary, GOI, Ministry of Steel	Udyog Bhawan, New Delhi 110 011	
10.	Shri M Nathan, Addl. Secy. & FA, GOI, Ministry of Steel	- Do. -	
11.	Prof Deepak Nayar	5, ABC Friends Colony (West), New Delhi 110 065	
12.	Shri A K Goswami	House No. 23, Sector 14-H, Noida 201 301, U.P.	

Dilip Kumar Basu Bose

Dilip Kumar Basu Bose
Registration No. RQP/CAL/098/88/A

C E R T I F I C A T E

1. Certified that the provisions of The Mineral Conservation & Development Rules, 1988, have been observed in this FINAL CLOSURE PLAN for 200.30 ha of forest land within 6.90 sq miles Mining Lease of Bolani Manganese & Iron Ores Mine of Steel Authority of India Limited in Keonjhar District of Orissa, and wherever specific permission is required the Applicant will approach the concerned authorities of Indian Bureau of Mines for granting permission.

2. The information furnished in the said Final Closure Plan are true and correct to the best of my knowledge and belief.

Dilip Kumar Bose.

Place - Calcutta
Date - 19.04.2010.

Dilip Kumar (Basu) Bose
Registration No. RQP/CAL/098 88/4

MINE

FINAL CLOSURE PLAN AS PER RULE 23C OF MCDR, 1988 FOR 200.38 HA. AREA WITHIN 6.90 SQ. MILES ML OF SAIL-BON

P.1 INTRODUCTION

This Final Closure Plan (FCP) pertains to the 200. 38 ha of Forest Land under surrender (u/s), a part of the originally granted mining lease over 6.90 sq. Miles (1786.74 ha) area

Name of the applicant - Steel Authority of India Limited (SAIL)

Location and extent of lease area - The lease area is the valley stretching from the foothills of the Bonai Range in the West to Barbil town (in Keonjhar District of Orissa State) in the East dissected more or less at the middle by the river. Karo (vide Surface Plan).

Location of the area U/s - The major portion is in Uliburu reserve forest at the NE corner of the aforesaid lease, having boundaries as below:

North - Lease boundary line of 6.90 sq. Miles ML
Approx. 22° 7' 30" N to 22°07'32" N and
85°22'32"E to 85°22'23" E

East - Eastern boundary of the said ML and Forest Line between
22° 07'32" N to 22°06'14" N and
85°22'32" E to 85°22'23" E

South - South boundary between
22° 6'30" N to 22° 06'14"N and
85°21'32" E to 85°22'32" E

West - Western boundary along Karo river between
22°07'30" N to 22°06'14"N and
85°22'54" E to 85°22'32" E
[Topo-sheet No. 73 F/8]

अनुमोदित
APPROVED
क्षेत्रीय खान नियंत्रक
REGIONAL CONTROLLER OF MINES
भारतीय खान ब्यूरो
INDIN BUREAU OF MINES
भुवनेश्वर/BHUBANESWAR

And a few patches of Khesra Forest area over Sermda, Santhbahal, Kolha Barpaida, Matkambeda and Sundra villages.

Type of lease area (forest, non-forest area) - 513.66 H is forest in Karo & Uliburu RF
192.86 H is Khesra Forest
1080.22 H is Non-forest land

Dilip Kumar Basu, Boss
Registration No. KQP/CAL/098/88/A

Area under surrender	-	174.44 H in Uliburu RF and 25.94 H in adjoining Khesra for
Present Land use	-	Virgin forest land never worked for [illegible] use
Method of Mining & Mineral processing	-	There was never any mining nor mineral processing.

1.1 **Reasons for closure**

Directive of the Govt. The Ministry of Environment & Forest, Government of India, by its letter no. 8-87/96-FC, dt: 24th February, 1999 (Anx 1) ordered reversal of this 200.30 ha land to the State Forest Department.

1.2 **Statutory obligations**

Yes, this "Final Closure" of the land under surrender is statutory obligation. It is being done under Rule 23(e) of MCDR, 1988

1.3 **Closure Plan preparation**

Name of Applicant	-	Steel Authority of India Limited (SAIL)
Address of Applicant	-	**(Corporate office)** Ispat Bhawan, Lodi Road, New Delhi- 110003 **(Mines)** Bolani Ores Mines Po-Bolani, Distt:Keonjhar, Orissa-758037
Name & Address of RQP who prepared the Closure Plan	:	The particulars of the RQP engaged by SAIL to prepare this Closure Plan is given below: Shri Dilip Kumar (Basu) Bose, 11/A Akshay Dutta Lane, Kolkata-700006 Phone No. 033-25308200 Email : dkbbolani@yahoo.com Registration No. RQP/CAL/098/88/A [valid upto 28.09.2010]
Prospecting Agency	:	All exploration, geological mapping, digging trial pits and trenches, as well as diamond drilling have been done departmentally - planning, execution (logging, analysis of cores included) and supervison done by Company's qualified technical personnel.
Copy of Board Resolution on decision of closure	-	Furnished (Anx. 2) Item No. 3.8 of 247th meeting of the Board of Directors held on 15.12.1998.

Dilip Kumar Bose

Dilip Kumar Basu) Bose
Registration No. RQP/CAL/098/88/A

2 MINE DESCRIPTION

2.1 Geology : Physiography & drainage - A U-bend of the river Karo has nearly bifurcated the area u/s into two halves - northern and southern. The northern part has gentle westerly slope towards the river. While the southern part slopes northward to river Karo but is a little steeper. Contours are from 460m to 445m.

General Geology - Most of the surface is soil (greyish in colour) covered without any rock exposure or structural features. However, near the East end, near Forest RH, Barbil, float BHJ boulders are seen scattered on surface. Along Karo river bank intense brecciation is witnessed. Broken pieces of BHQ/iron ore and occasional phyllite are cemented in lateritic matrix.

The soil may overlie shale and the association of breccia conglomerate may indicate it to be Upper Shale of the Iron ore series, according to Jones (GSI Mem. V.63 pt.2)

BHJ/J, iron ore, laterite and phyllite - non contains any toxic substance.

2.2 Reserves No ore (barring lean scattered pieces of iron ore near the Forest RH, Barbil) has been found in this area under surrender. Hence there seems to be no reserve of any ore.

2.3 Mining Method etc Because of occurrence of no ore here, never any mining or mineral beneficiation was done.

3 REVIEW OF IMPLEMENTATION OF SCHEME OF MINING INCLUDING PMCP UP TO FINAL CLOSURE OF THE MINE

No Scheme of Mining or PMCP was ever prepared for this lease including area u/s, since approval of first MP on 21.02.1992. Therefore, no progress report about implementation can be given..

Dilip Kumar Basu, Bose
Registration No. RQP/CAL/098/88/A

4 CLOSURE PLAN

4.1 Mined out land

No stretch of land in this area was ever broken for mining or any other purpose. Hence, no reclamation or rehabilitation is necessary.

4.2 Water quality Management

On surface no nala, water bearing or dry, occurs. However, near the river bank, small deep gulleys have formed due to rapid flow of rain water. The drainage, as stated in para 2.1 above, is towards the Karo river.

4.3 Air quality Management

In view of no drilling, blasting, excavation or hauling of ore or overburden ever in the area, quality of air has not been affected needing any corrective measure.

4.4 Waste Management

No waste was ever generated in this area because of no mining. Hence, no management action is necessary.

4.5 Top Soil Management

Because of no mining, state of top soil of this area was not disturbed ever in any manner requiring management action.

4.6 Tailing dam management

There is no tailing dam here needing any management action.

4.7 Infrastructure

Present access to the area u/s is by un-metalled forest road thro' Limtur village crossing the Karo along North lease boundary, almost along the border of the area u/s. A south turn a little after crossing the river the road reaches the Forest RH, Barbil and thence to Barbil Railway station.

4.8 Disposal of mining machinery

No mining machinery was ever brought or installed here. Hence, the area has no such machine to dispose of. .

Dilip Kumar Basu) Bose
Registration No. RQP/CAL/098/88/A

4.9 **Safety & Security**

In view of never any mining, operation of plant or machinery, drilling, blasting etc., there is nothing unsafe in this area. No security measure is needed either in view of no installation or stockpile.

4.10 **Disaster management & risk assessment**

Because of never any drilling, blasting, mining excavation, creation of waste dumps, installation-operation of any plant or machine, there exists no possibility of occurrence of any disaster like collapse of ground, things catching fire, innundation of pits etc., calling for, in turn, any set up to combat such disaster.

4.11 **Care & Maintenance during temporary discontinuance**

In view of never any mining or allied activity in this area, question of its temporary suspension does not arise and call for any care and maintenance in that regard.

Dilip Kumar Basu Bose.

Dilip Kumar Basu Bose
Registration No. RQP/CAL/098/88/A

5 ECONOMIC REPERCUSSIONS

5.1 Status of local residents employed

As mining or any related activity ever occurred in this area, status of local residents has not been affected in any way.

5.2 Compensation to be given

As the lessee never employed any person in any job in this area, no compensation is payable to any one because of this surrender.

5.3 Satellite occupation

Because of never any principal activity of mining in this area there never occurred any generation of any satellite occupation. As a result this surrender will not affect anybody.

5.4 Continued engagement of employees

In view of no engagement of any person in any activity in this area by the lessee, question of continued engagement does not arise.

5.5 Envisaged repercussions on the expectation of the society

Because of no mining or proposal thereof for this area, no expectation grew in the society, and hence there will not be any repercussion on account of this surrender.

Dilip Kumar Basu.

Dilip Kumar (Basu) Bose
Registration No. RQP/CAL/098/88/A

6 **TIME SCHEDULING FOR ABANDONMENT**

The abandonment (i.e., surrender of forest land) will not involve closure of mining operation or stopping of a plant, shifting/retrenching labour, dismantling installations and will comprise only some paper work and boundary demarcation. All work in this respect will be completed in **12 (twelve) months** time.

7 **ABANDONMENT COST**

It is to be NIL, as the lessee is returning the area unencumbered without changing its character from that it received at the time of grant of the lease.

8 **FINANCIAL ASSURANCE**

As no expenditure is to be incurred for this "Final Closure" i.e., surrender no financial assurance is to be given - Vide Table.

TABLE : BREAK-UP OF AREAS IN THE MINING LEASE FOR CALCULATION OF FINANCIAL ASSURANCE

Sl. No.	Head	Area put on use at start of Plan (Ha)	Additional requirement during Mining Plan period (Ha)	Total (Ha)	Area Considered as fully Reclaimed and Rehabilitated (Ha)	Net area considered for Calculation (Ha)
1	AREA UNDER MINING	Nil	Nil	Nil	Nil	Nil
2	STORAGE FOR TOP SOIL	Nil	Nil	Nil	Nil	Nil
3	OVERBURDEN /DUMP (including Old Tailing Pond)	Nil	Nil	Nil	Nil	Nil
4	MINERAL STORAGE	Nil	Nil	Nil	Nil	Nil
5	INFRASTRUCTURE (WORKSHOP, ADMN BLDG ETC.)	Nil	Nil	Nil	Nil	Nil
6	ROADS & CONVEYORS	Nil	Nil	Nil	Nil	Nil
7	RAILWAY	Nil	Nil	Nil	Nil	Nil
8	GREEN BELT & PROHIBITED ZONE	Nil	Nil	Nil	Nil	Nil
9	TAILING POND	Nil	Nil	Nil	Nil	Nil
10	EFFLUENT TREATMENT PLANT	Nil	Nil	Nil	Nil	Nil
11	EXPLORATION	Nil	Nil	Nil	Nil	Nil
12	MINERAL SEPARATION PLANT	Nil	Nil	Nil	Nil	Nil
13	TOWNSHIP AREA	Nil	Nil	Nil	Nil	Nil
14	OTHERS (MAGAZINE)	Nil	Nil	Nil	Nil	Nil
15	GRAND TOTAL	Nil	Nil	Nil	Nil	Nil

Dilip Kumar Basu Bose

Dilip Kumar ,Basu Bose
Registration No. RQP/CAL/098/88/A

9 **Certificates** : The Certificate by the nominated owner, dated 30.06.2010, furnished in original, giving undertaking to implement the Closure Plan.

Certificate by RQP is also given..

10 **Plans** : The following Plans showing FCP area are attached herewith.

i) Key Plan Scale : 1: 50000 (Plan No FCP/MN/1)
ii) Lease Plan Scale 1: 3960 (Plan No. FCP/MN/2)
iii) Surface Plan Scale 1:5000 (Plan No. FCP/MN/3)
iv) Surface Geol Plan Scale 1:5000 (Plan No. FCP/MN/4)
v) Environment Plan Scale 1:5000 (Plan No. FCP/MN/5)

Photographs

1. View of area under surrender (u/s) on the left bank of karo river Near North-East corner
2. View of area u/s on the right bank of Karo river near South-West Corner.
3. View of virgin forest land u/s from South-East corner point
4. View of virgin forest land u/s from NW boundary line
5. View of virgin forest land southern boundary line
6. View of forest growth in the area u/s at SE corner near Barbil Forest Rest House.

अनुमोदित
APPROVED

5/8/08

क्षेत्रीय खान नियंत्रक
REGIONAL CONTROLLER OF MINES
भारतीय खान ब्यूरो
INDIN BUREAU OF MINES
भुवनेश्वर/BHUBANESWAR

Dilip Kumar (Basu) Bose
Registration No. RQP/CAL/083/80/A

Anx. 1

तार :
Telegram : PARYAVARAN,
NEW DELHI
दूरभाष :
Telephone :
टेलेक्स :
Telex : W-66185 DOE IN
FAX : 4360678

भारत सरकार
पर्यावरण एवं वन मंत्रालय
GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT & FORESTS
पर्यावरण भवन, सी. जी. ओ. कॉम्पलेक्स
PARYAVARAN BHAVAN, C.G.O. COMPLEX
लोदी रोड, नई दिल्ली–110003
LODHI ROAD, NEW DELHI-110003

No. 8-87/96-FC

24th Feb,99

To

The Secretary (Forests),
Government of Orissa,
Bhubaneshwar.

Subject:- Diversion of 706.52 ha of forest land for renewal of of mining lease in favour of M/s SAIL, Bolani Ore Mines, Keonjhar District.

Sir,

I am directed to refer to your letter no. 10F (Cons) - 19/97.26436/F&E dated 21st December,98; this Ministry's letters of even no. dt 29th May,97 and 27th April,98 on the abovementioned subject.

2. The request made vide your above referred letter for recasting of area statement of this proposal, was examined in detail and considered carefully. Accordingly, the Central Government hereby agrees in principle for approval of diversion of 465.62 ha. of forest land (160.73 ha. already broken up area + 37.25 ha. unbroken area to be worked during present renewal period + balance 267.64 ha. to be maintained as forest) for renewal of mining lease in favour of M/s Steel Authority of India Ltd., in Bolani Ore Mines in Keonjhar District subject to the fulfilment of following conditions:-

(i) Immediate action should be taken for transfer and mutation of identified 304.89 ha. of non-forest land in favour of the State Forest Department.

(ii) The user agency will transfer the funds for compensatory afforestation (revised as on date to incorporate existing wage structure) over 304.89 ha. area in favour of the State Forest Department.

(iii) The user agency will transfer the cost of penal compensatory afforestation (revised as on date to incorporate existing wage structure) over 327.66 ha. of degraded forest land.

(iv) The user agency will transfer the funds for fencing, protection and regeneration of 40.60 ha. of safety zone area and also the cost of afforestation over one and a half times of safety zone area in degraded land elsewhere, in favour of the State Forest Department.

(v) The balance 200.30 ha. of forest land not agreed to by this Ministry will be reverted back to the State Forest Department.

3. After receipt of compliance report on the fulfilment of the above mentioned conditions from the State Government, formal approval will be issued in this regard under Section-2 of the Forest (Conservation) Act, 1980. Transfer of forest land to user agency shall not be effected by the State Government till formal order approving diversion of forest land is issued by the Central Government.

4. This order supersedes all the previous orders issued vide this Ministry's letters of even no. dated 29th May, 1997 and dated 27th April, 1998.

Yours faithfully,

(JP Mishra)
Assistant Inspector General of Forests

Copy to:

1. The Principal Chief Conservator of Forests, Govt. of Orissa, Bhubaneshwar.
2. The Nodal Officer, Office of the PCCF, Govt. of Orissa, Bhubaneshwar.
3. The Chief Conservator of Forests (Central), Regional Office, Bhubaneshwar.
4. R.O. (HQ), New Delhi.
5. Guard File.

(JP MISHRA)
Assistant Inspector General of Forests

ANX. 2

247th meeting 15.12.98

7234. Item No.3.8: Surrender of 200 Ha of forest land of Bolani Ore Mines to Orissa State Forest Department.

The Board resolved that the proposal for surrender of 200 Ha of forest land in 6.9 sq. miles lease of Bolani Ore Mines, RMD (SAIL) to Orissa State Forest Department as per condition stipulated in Stage-1 forestry clearance order of Ministry of Environment and Forest, Government of India, as detailed in the agenda note, be and is hereby approved.

Action: D(P&CP)

XXX XXX XXX

KIND ATTN: MR. ARUN KUMAR
SR. MGR (EKL)

FAX: 033-22823990

1/5

247TH MEETING OF THE BOARD OF DIRECTORS
TO BE HELD ON 15TH DECEMBER, 1998

Item No. 3.8

Sub : Surrender of 200 Ha of forest land in 6.9 sq.miles lease of Bolani Ore Mines, to Orissa State Forest Department as per condition stipulated in Stage - 1 forestry clearance order of Ministry of Environment and Forest , Government of India.

[For Approval]

RESOLVED THAT

The proposal for surrender of 200 Ha of forest land in 6.9 sq.miles lease of Bolani Ore Mines, RMD (SAIL) to Orissa State Forest Department as per condition stipulated in Stage - 1 forestry clearance order of Ministry of Environment and Forest , Government of India. , be and is hereby approved

Note

1.0 Bolani Ore Mines is located in the Saranda & Karo Forest Divison of Keonjhar Distt. of Orissa. There are two leases of Bolani Ore Mines.

1.1 5.1 sq.miles lease holding the main iron ore quarries and some units of the processing plant.

1.2 6.9 sq. miles lease mainly caters to the need of supporting infrastructural and ancillary facilities to the Iron ore mining of 5.1 sq. miles lease for supply of ore to Durgapur Steel Plant. Apart from this there are townships, hospital and such other service facilities of Bolani Ore Mines which are mostly located in the non-forest portion of the lease. The break-up details of forest land in the 6.9. sq. miles lease of Bolani is given as below :

Total lease area	1786.74 ha
Total forest land	706.52 ha
Forest land broken prior to 25.10.1980	163.83 ha
Forest clearance applied for (incl. 163.83 ha)	706.52 ha
MoEF/GOI agreed for diversion of forest land as part of ML renewal	506.52 ha
MoEF/GOI directive vide condition V of Stage-IFC order dated 29.5.97 for reverting to State Forest Department	200.00 ha

2/5

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93

2.0 The mining lease of the total land on lease (1786.74 ha.) expired on 13.11.1982. Renewal application was submitted to the State Government prior to the expiry on 12.11.1981. The Ministry of Environment & Forest (MOEF), Govt. of India, vide its letter No.8-87/96-FC dated 29.5.97 followed by **modified Order** vide letter of even number dated 27.4.98 granted Stage -I forestry clearance to 506.52 Ha of forest land (out of the total forest land of 706.52 Ha) on the conditions that the balance 200 Ha of forest land, not agreed by the MOEF, will be reverted to the State Forest Dept. However, a temporary working permission for a period of nine months has been granted over 163.83 ha of already broken up area prior to 1980. No fresh forest area will be broken up during this period of temporary working permission. 506.52 Ha of Forest land agreed by MOEF for diversion in principle includes 163.83 Ha of land already broken. In the balance 342.69 Ha of virgin forest land, 37.25 Ha is allowed to be broken immediately and 305.44 is to be maintained as forest land for the time being.

2.1 On 25.10.1980 Forest (Conservation) Act 1980 was enacted. Under this Act approval of Central Government is necessary for using forest land (all forest land even if such forest land as was broken prior to 25.10.1980, once the mining lease expired) for non-forest purposes such as for mining and its allied activities. Central Government will give permission to use forest land for non-forest purposes under special circumstances with conditions to be complied with by User Agency before the release of the dereserved forest land. The details of forest land are as follows:

Forest Land	706.52 Ha
Non-Forest+ Tenanted land	1080.22 Ha
Total land on lease	1786.74 Ha

3.0 The conditions for transfer of land will be fulfilled when MOEF issues the **second modified order** on Safety zone against their letter No.8-87/96-FC dated 29.5.97 following which DFO would be approached for demand note for depositing funds with the State Govt. Only then actual execution of the compliance of all 5 conditions can be executed. The conditions are further explained below :

Condition i - Immediate action should be taken for transfer and mutation of identified 342.69 ha. of non-forest land in favour of the State Forest Department.

Explanation: As per Forest(Conservation) Act, 1980 and guidelines issued by MOEF, when any forest land is diverted for non-forest purpose then an equivalent non-forest land is to be transferred to the ownership of State Forest Dept. for compensatory afforestation. In the present case, 342.69 Ha of virgin forest land (additional to existing 163.83 Ha of broken land) has been agreed for diversion,

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3/5

therefore, transfer and mutation of 342.69 Ha of non-forest land is to be made in favour of State Forest Dept. The said land is located in different villages of Ghatgaon, Hatadihi and Anandpur Tehsils of Keonjhar District, Orissa.

Condition II -The user agency will transfer the funds for compensatory afforestation (revised as on date to incorporate existing wage structure) over 342.69 ha., area in favour of the State Forest Department.

Condition iii - The user agency will transfer the cost of penalty compensatory afforestation (revised as on date to incorporate existing wage structure) 327.66 ha. of degraded forest land.

Condition iv - The user agency will transfer the funds for fencing, protection and regeneration of safety zone area and also the cost of afforestation over one and a half time of safety zone area in degraded forest elsewhere, in favour of State Forest Department.

Condition v -The balance 200 ha. of forest land not agreed to by this Ministry will be reverted back to State Forest Department.

Explanation for Conditions ii to v:- The actual financial implication will be known when demand note will be raised by the State Forest Dept. However, likely fund requirement to be deposited by SAIL/RMD may be as follows:

- Funds for compensatory afforestation (Condition ii) - Rs.58 lakhs
- Cost of penal compensatory afforestation (Condition iii) - Rs. 28 lakhs
- Funds for fencing, protection & regeneration (Condition iv) - Rs.15 lakhs

3.1 When any forest land is diverted for non-forest purposes, afforestation is done by Forest Dept. over an equivalent non-forest land which is known as "Compensatory Afforestation". Cost of afforestation is calculated by the Forest Dept. taking into account the existing wage structure of the concerned State Govt. as on date. **As such it is proposed that in the meantime, parallel action may be taken such as approval of Board of Directors for surrendering 200 Ha of forest land in 6.9 sq. miles lease of Bolani Ore Mines,** mutation of land by State Revenue Dept. in favour of State Forest Dept., Govt. of Orissa, District level etc. , Chief Conservator of Forest (Nodal), Govt. of Orissa, Bhubaneswar will now require to forward the case to MOEF, New Delhi for issue of long awaited second modified order.

4.0 MoEF has mentioned that the transfer of forest land to the user agency shall not be effected by the State Government till formal order approving diversion of forest land are issued by the Central Government.

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5.0 Logically the said land should stand automatically reverted to the Govt. but MoEF and State Govt. have been insisting upon formal surrender of this land which needs Board's approval.

6.0. In view of the above, the proposal to surrender 200 Ha of forest land in 6.8 sq.miles lease of Bolani Ore Mines, RMD (SAIL) to Orissa State Forest Department as per condition stipulated in Stage - 1 forestry clearance order of Ministry of Environment and Forest , Govt. of India in their letter No. 8-171/97-FC dated 29.5.1997 / 27/4/1998 may please be approved.

7.0 The proposal has the concurrence of RMD and Personnel & Finance of Corporate office.

[T.Tiwari]
Executive Director [P&A]

[R.K Garg]
Secretary

5/5

Anx-3

सत्यमेव जयते

भारत सरकार
भारतीय खान ब्यूरो, भुवनेश्वर
INDIAN BUREAU OF MINES, BHUBANESWAR
GOVT. OF INDIA

CERTIFICATE OF RECOGNITION AS QUALIFIED PERSON TO PREPARE MINING PLANS

(Under Rule 22 (c) of Mineral Concession Rules 1960)

Shri ..Dilip..Kumar...(Basu)..Bose..... resident of ..11/1,..Akshay...Dutta...Lane,..Calcutta.-.700006....., son of ....Shri..Ashutosh....Bose....., having given satisfactory evidence of his qualifications and experience is hereby granted recognition under Rule 22 (c) of the Mineral Concession Rules, 1960 as a Qualified Person to prepare Mining Plans.

His registration number is | RQP/CAL/098/88/A |

This recognition is valid for a period of two years ending .28.th..September..1990.....

नवीनीकृत दिनाक 28.09.1992 तक
Renewed up to 28th September, 1992

Place : Calcutta
Date : 29.9.88

H Basu
Regional Controller of Mines
Indian Bureau of Mines
.....Calcutta.....

नवीनीकृत दिनाक
Renewed up to 28 SEP 1994 तक

दी गई दिनाक
Renewed up to 28 SEP 1996

नवीनीकृत दिनाक
Renewed up to 28 SEP 1998 तक

क्षेत्रीय खान नियंत्रक
Regional Controller of Mines
भारतीय खान ब्यूरो
Indian Bureau of Mines

P.T.O.

Regional Controller of Mines
Indian Bureau of Mines
Calcutta.

Renewed ... 28.09.2000

आगामी दिनांक ... 28.09.2010
Renewed up to

क्षेत्रीय खान नियंत्रक
Regional Controller of Mines
भारतीय खान ब्यूरो
Indian Bureau of Mines
कलकत्ता
Calcutta

Above 1. View of area under surrender (U/S) on the left bank of Karo river, near NW corner.

Below 2. View of area U/S on the right bank of Karo river near SW corner.

Dilip Kumar Basu Bose
Registration No. RQP/CAL/098/86/A

Above 3. View of virgin forest land U/S from near SE corner point.

Below 4. View of virgin forest land U/S from NW boundary line.

Dilip Kumar Basu Bose
Registration No. EQ/CAL/098/88/A

Above 5. View of virgin forest land U/S
from Southern boundary line.

Below 6. View of forest growth in area U/S
at SE corner near Barbil Forest Rest House.

Dilip Kumar Basu Bose.

Dilip Kumar Basu Bose
Registration No. MQ-/CAL/098/88/A