# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>S. NO</th>
<th>TITLE</th>
<th>PAGE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>Executive Summary</td>
<td>3</td>
</tr>
<tr>
<td>2.0</td>
<td>Introduction of the Project / Background Information</td>
<td>4</td>
</tr>
<tr>
<td>3.0</td>
<td>Project description</td>
<td>9</td>
</tr>
<tr>
<td>4.0</td>
<td>Site analysis</td>
<td>23</td>
</tr>
<tr>
<td>5.0</td>
<td>Planning brief</td>
<td>25</td>
</tr>
<tr>
<td>6.0</td>
<td>Proposed infrastructure</td>
<td>29</td>
</tr>
<tr>
<td>7.0</td>
<td>Rehabilitation and Resettlement (R&amp;R) Plan</td>
<td>30</td>
</tr>
<tr>
<td>8.0</td>
<td>Project schedule and cost estimates</td>
<td>30</td>
</tr>
<tr>
<td>9.0</td>
<td>Analysis of proposals (Final recommendation)</td>
<td>31</td>
</tr>
</tbody>
</table>
## LIST OF ANNEXURES AND PLATES

<table>
<thead>
<tr>
<th>S. NO</th>
<th>ANNEXURES</th>
<th>PAGE NO.</th>
<th>IT’S REFERENCE IN PRE FEASIBILITY REPORT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>Annexure 1</td>
<td>33</td>
<td>4</td>
</tr>
<tr>
<td>2.0</td>
<td>Annexure 2(i),2(ii)&amp;2(iii)</td>
<td>36</td>
<td>4</td>
</tr>
<tr>
<td>3.0</td>
<td>Annexure 3</td>
<td>56</td>
<td>4</td>
</tr>
<tr>
<td>4.0</td>
<td>Annexure 4</td>
<td>58</td>
<td>9</td>
</tr>
<tr>
<td>5.0</td>
<td>Annexure 5</td>
<td>59</td>
<td>9</td>
</tr>
</tbody>
</table>
1.0 Executive Summary

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Particulars</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td><strong>Name of the Project</strong></td>
<td>Bailadila Iron Ore Project, 11 ML, Kirandul &amp; Bacheli Complex of NMDC Limited.</td>
</tr>
<tr>
<td>1.</td>
<td>Production Capacity</td>
<td>Present production capacity: 11.30 Million tons per annum (MTPA) Run off Mine iron ore.</td>
</tr>
<tr>
<td>B.</td>
<td><strong>Location Details</strong></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Village</td>
<td>Kirandul</td>
</tr>
<tr>
<td>3.</td>
<td>Tehsil</td>
<td>Bade Bacheli</td>
</tr>
<tr>
<td>4.</td>
<td>District</td>
<td>South Bastar Dantewada</td>
</tr>
<tr>
<td>5.</td>
<td>State</td>
<td>Chhattisgarh</td>
</tr>
<tr>
<td>6.</td>
<td>Coordinates</td>
<td>Geographical coordinates of the project area are given below: [18^037'34.6006'' \text{ to } 18^041'26.1792'' \text{ N} ] [81^013'07.0266'' \text{ to } 81^015'18.0396'' \text{ E} ]</td>
</tr>
<tr>
<td>C.</td>
<td><strong>Lease Area Details</strong></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Mining Lease area</td>
<td>874.924 Ha</td>
</tr>
<tr>
<td>D.</td>
<td><strong>Extent of mechanization</strong></td>
<td>Fully mechanized Iron Ore Mine</td>
</tr>
<tr>
<td>9.</td>
<td>Proposed mechanization for capacity expansion</td>
<td>No plans for mechanization for capacity expansion.</td>
</tr>
<tr>
<td>E</td>
<td><strong>Cost Details</strong></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Project Cost</td>
<td>Rs. 46963 Lakhs</td>
</tr>
<tr>
<td>11.</td>
<td>Cost of EMP (Capital)</td>
<td>Rs. 1174 Lakhs</td>
</tr>
<tr>
<td>F</td>
<td><strong>Others</strong></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Addl. Water Requirement</td>
<td>NA (This is an Existing projects, no additional water requirement.)</td>
</tr>
<tr>
<td>13.</td>
<td>Addl. Man power Requirement</td>
<td>NA (This is an Existing projects, no additional water requirement.)</td>
</tr>
</tbody>
</table>
2.0 **Introduction of the Project / Background Information**

2.1 **Identification of Project & Project Proponent. In case of mining project, a copy of mining lease / letter of intent should be given.**

**Name of the Project:** Bailadila Iron Ore Project, 11 ML, Kirandul & Bacheli Complex of NMDC Limited.

**Location:** Kirandul, Dist: South Bastar Dantewada, Chhattisgarh- 494556

**ML Area:** 874.924 ha. of forest land falling in Bailadila Reserved Forest, Bacheli range, Dantewada Forest Division, Chhattisgarh.

**Mining Lease Details:**

Deposit 11 Mining Lease is granted from 11.09.2017 to 10.09.2037 and is valid upto 10.09.2037. The lease deed has been executed up to 31/3/2020.

<table>
<thead>
<tr>
<th>Name of ML</th>
<th>Area in Ha</th>
<th>Status</th>
<th>Valid upto</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deposit 11</td>
<td>874.924</td>
<td>Granted</td>
<td>31-03-2020</td>
</tr>
</tbody>
</table>

Letter of grant for renewal of above mining lease up to 10.09.2037 is enclosed as **Annexure-1**. The lease deed is under execution for the period up to 10.09.2037.

**Environment Clearance:**


**Forest Clearance:**

Ministry of Environment and Forests (MoEF), New Delhi accorded forest clearance to the Deposit-11 M.L area of Kirandul Complex of NMDC Limited in 1999. Details are given in the following table:

<table>
<thead>
<tr>
<th>Lease</th>
<th>Forest Clearance Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deposit 11 ML</td>
<td>F. No. 8-98/97-FC dated 22.12.1999</td>
</tr>
</tbody>
</table>

Note: Copy of Forest clearance letters received from MoEF, New Delhi for above mining lease is enclosed as **Annexure-3**.
In terms of MoEFCC circular no: 11-51/2015-FC dated 1/4/2015, the validity of approvals under F.C. Act 1980 shall be extended and shall be deemed to have been extended up to a period co-terminus with the period of Mining Leases in accordance with MMDR Amendment Act 2015 subject to condition "NPV" of forest land shall be paid to Forest Department, if not paid. Based on demand note received from DFO, Dantewada, Rs.82.16 Cr for Deposit-11 M.L. area have been paid to CAMPA A/C on 18/8/15.

**Project Proponent:**

NMDC is incorporated in 1958 as a Government of India fully owned public enterprise. It is under the administrative control of the Ministry of Steel, Government of India.

NMDC has made valuable and substantial contribution to the National efforts in the mineral sector during the last five decades and has been accorded the status of schedule-A Public Sector Company. In recognition to the Company's growing status and consistent excellent performance, the Company has been categorized by the Department of Public Enterprises as "NAV RATNA" Public Sector Enterprise in 2008.

NMDC is India's single largest iron ore producer, presently producing about 30 million tonnes of iron ore from 3 fully mechanized mines viz., Bailadila Deposit-14/11C,11B, Bailadila Deposit-5, 10/11A in South Bastar Dantewada District, Chhattisgarh State and Donimalai Iron Ore Mines & Kumaraswamy Iron Ore Mines in Bellary District. Karnataka State. For Value addition NMDC is in the process of developing a 3 million ton per annum integrated steel plant at Nagarnar near Jagdalpur, C.G and 2 pellet plants at Donimalai (1.2 MTPA) and at Bacheli (4 MTPA). Besides, NMDC has acquired Sponge Iron India Limited with plan for expansion to produce billets.

The company is in the process for the implementation of integrated management system covering ISO 9001, ISO 14001, OHSAS 18001 & SA 8000 at all iron ore mining project locations.

Besides iron ore, NMDC also plans to go for other minerals like Coal, Diamond, gold etc for which NMDC is looking forward for leases / buy properties from foreign countries directly / under Special Purpose Vehicle / Joint Ventures.

For continuing the exploration activities NMDC has set a Global Exploration Centre at Raipur, Chhattisgarh.

NMDC is taking up diversification activities through its intensive R&D efforts for production of High-Tech and High Value added products. The study is also being conducted for setting up a demonstration plant to beneficiate BHJ/BHQ material for up gradation to +64% Fe iron ore concentrate.

NMDC is also investing in development of renewable energy resources as an environment friendly investment. A Wind mill project (10.5MW capacity) has been completed & commissioned at Karnataka.
Name and Address of the Project Proponent:

<table>
<thead>
<tr>
<th>Registered Address:</th>
<th>Address for Correspondence:</th>
</tr>
</thead>
</table>

2.2 Brief Description of the Nature of Project

Bailadila Iron Ore Deposit-11 Mining Lease extends over 874.924 Ha forest land and comprises of Bailadila Deposit-11A, 11B and 11C mines. Initially, the iron ore production operations commenced in the year 1986 from Deposit-11C and the ROM iron ore is hauled to crushing plant located in adjacent mining lease of NMDC i.e Deposit-14 NMZ. Subsequently, the iron ore mining operations commenced in the year 2002 at Deposit-11A. The deposit-11A is sharing common infrastructure facilities with adjacent Bailadila Deposit-10 of NMDC located at Bacheli complex. After creating necessary infrastructure facilities such as crushing plant and down hill conveyor exclusively for Deposit-11B in Deposit-11 M.L. area, the iron ore mining operations commenced form the year 2014 onwards at Deposit-11B.

Drilling is done with blast hole drills. Blasting is done with SME explosives. The blasted material of size less than 150mm is excavated using Shovel (4.6 / 8 m³ capacity) and unloaded into dumpers of 50/85/100 Ton capacity. The dumpers carry the material on designated haul roads to dumper platform where dumpers unload the material into gyratory crusher. The mined ore from Dep-11A mine, 11B mine and 11C mines transported to respective crushing plants located at Bailadila Deposit-10 M.L, Deposit-11 M.L and Deposit-14 NMZ Mining lease areas. At the crushing plant, the ore is reduced in size to ~150 mm. The haul roads have maximum gradient of 1 in 16. Berms of 10-12 meters are left out at worked out benches maintaining over all bank slopes of 45 or less. In laterite and blue dust areas the width of the berm is increased to 20 meters for safety and bench height is kept at 10 meters.

The crushed Iron ore material is transported through closed downhill conveyor system to screening plants-I / II located at Kirandul for Deposit-11B & 11C and to screening plant-II located at Bacheli . The sizing of ore is done in the plant to separate the ore into Lump ore (minus 150mm & plus 10mm), CLO (30/40 to 10mm), Fine ore (below 10mm). The above products are transported through closed downhill conveyor system to Loading plants at Kirandul (for Dep-11B & 11C) and at Bacheli (for Dep-11A) where stacking and reclamation is done through mechanized way. Lump & fine ore is reclaimed mechanically and loaded
into the Railway wagon at the Loading Plant. The iron ore material from hill top to loading plant is transported through closed down hill conveyor system.

NMDC has obtained Environmental clearances for Bailadila Deposit-11A, 11B and 11C from MOEF&CC during various time periods under EIA 1994 / 2006 notification depending upon the development of mines. The total E.C. capacity available for Bailadila Deposit-11 ML for Deposit-11A, 11B and 11C mines is 11.30 MTPA ROM Iron ore.

MOEFCC has issued Notification no: 1530(E) dated 6/4/2018, where projects which have obtained Environmental Clearance under EIA Notification 1994, shall submit an application in Form-1 as given in Appendix-II of the EIA Notification 2006 within six months for grant of E.C under the provisions of the EIA 2006.


Since Deposit-11B is part of Deposit-11 ML and it comprises of other deposits such as Deposit-11A and 11C, it is proposed to obtain Environmental clearance for existing ROM Iron ore production capacity of 11.30 MTPA for a lease area of 874.924 Ha by amalgamation of environmental clearances of Deposit-11A (EIA 2006) and 11B (EIA 1994) and Bailadila Deposit-11C (integrated E.C of Bailadila Deposit-14/11C project under EIA 2006).

### 2.3 Need for the Project & Its Importance to the Country/ Region

India has large and rich potential of iron ore both in terms of quality and quantity. Hematite and Magnetite are the most important forms of iron ores in India. Indian Steel sector was liberalized in 1990s and thereafter, several pig iron plants, sponge iron plants and integrated steel plants have been setup in private sector. For the purpose of meeting domestic and export requirements of iron ore, NMDC developed iron ore mines in the Bailadila range of hills in the southern part of the South Bastar Dantewada district of Chhattisgarh state.

The existing mining projects of NMDC have given social benefits to surrounding population in the form of educational facilities, roads, communication facilities, transportation, marketing, banking, postal services and health facilities directly or indirectly. The civic amenities have already been developed due to existing mines in Bailadila complex.

The location of the mines in Bailadila Iron Ore Complex has helped to improve vastly the financial resources of the surrounding population by way of petty trade and employment opportunities. The projects had encouraged the setting up of various utility services and petty trade benefiting around 5,000 people around the mining areas mainly in Kirandul and Bacheli.
2.4 Demand-Supply Gap

Steel Ministry proposes to increase iron ore availability in the country in order to reduce the imports of Steel. In this context, NMDC has to enhance production incrementally and aim for annual production of 50 million tonnes iron ore by 2018-19 and 67 million ton by 2021-22 to increase iron ore availability in the country.

Annual production of steel in the country is planned to be increased to a level of 300 million tonnes by 2030-31, as per National Steel Policy-2017. That will necessitate production of 400-450 million tonnes of iron ore annually. To meet country’s requirement of iron ore, it is essential that NMDC shall enhance its iron ore production substantially, through all possible means.

Rashtriya Ispat Nigam Limited (RINL), Kudremukh Iron Ore Company Limited (KIOCL), Essar Steel meet their Iron Ore requirement from Bailadila deposits. Numerous steel plants in Chhattisgarh depend upon Bailadila Iron Ore Mines for the iron ore requirement. In order to meet the continuous iron ore demand of steel plants the production capacity is to be enhanced.

2.5 Imports Vs Indigenous Production

India imported 6.00 Million Tonnes of Iron ore in 2016-17 due to the closure of mines in Karnataka/Goa and Odisha. Iron ore production in India during 2016-17 was 192 million tonnes. Domestic production needs to be increased to reduce the imports.

2.6 Export Possibility

India exported 24.00 million tonnes of iron ore during 2016-17.

2.7 Domestic/Export Markets

India need iron ore production of around 400 - 450 million tons per annum to meet the steel production of 300 million tons up-to 2030-31 as per National Steel Policy-2017.

2.8 Employment Generation (Direct & Indirect) Due to the Project

Bailadila Iron Ore Mine- Kirandul Complex employs 1626 people (as on 1st April 2017) directly and about 1000 people are employed through different contractors, whereas 244 people are directly employed in 10&11A unit of Bailadila Iron ore mine- Bacheli Complex.

The existing mining activities are providing indirect employment to more than 5000 persons in Kirandul, Bacheli and nearby villages.
3.0 Project Description

3.1 Type of Project Including Interlinked and Interdependent Projects, If any

NMDC commenced its mining operations at Kirandul complex in 1968 with opening of Deposit-14 mine at Bailadila range of hills. Subsequently, the iron ore production operations commenced in the year 1986 from Deposit-11C and the ROM iron ore is hauled to crushing plant located in adjacent mining lease of NMDC i.e Deposit-14 NMZ. Already sufficient infrastructure facilities such as Screening plant, loading plant, tailing dam, Central stores depot, township, etc are established at Kirandul to cater the requirement of Bailadila Deposit-14/11C Project. Subsequently, the iron ore mining operations commenced in the year 2002 at Deposit-11A. The deposit-11A is sharing common infrastructure facilities with adjacent Bailadila Deposit-10 of NMDC located at Bacheli complex. After creating necessary infrastructure facilities such as crushing plant and downhill conveyor exclusively for Deposit-11B in Deposit-11 M.L. area, the iron ore mining operations commenced form the year 2014 onwards at Deposit-11B.

The activities / facilities are:
1. Excavation,
2. Drilling,
3. Blasting,
4. Haulage
5. Dumping
6. Crushing
7. Screening
8. Stacking and dispatch
9. Maintenance & Repair
10. Environmental protection measures
11. Infrastructure

3.2 Location (Map Showing General Location, Specific Location, and Project Boundary & Project Site Layout) with coordinates

Village : Kirandul
Mandal: Dantewada
District: South Bastar Dantewada
State : Chhattisgarh

The project area and the 10 km radius study area surrounding the project area falls within Survey of India Topo sheet no. 65F/2, 65F/6 (old) [E44J2 and E44J6 (new)]. Location map and SOI Topo sheet are enclosed as Annexure 4 & 5 respectively.

3.3 Details of Alternate Sites Considered and basis of selecting the proposed site, particularly the environmental considerations gone into should be highlighted.
Mining project is site specific and this project is an existing project, hence no alternate site is considered.

3.4 Size or Magnitude of Operation

The maximum rated capacity of the project will be 11.3 Million Tonnes per Annum (ROM) of Iron ore production.

3.5 Project Description with Process Details (a schematic diagram / flow chart showing the project layout, components of the project should be given)

3.5.1 Geology

a) Topography

The area lies within Survey of India Toposheet No. 65F/2 and 65F/6 (E44J2 and E44J6). It is easily accessible by all-weather roads to Raipur (431 km), Vizag (450 km) and Hyderabad (605 km) and by Railway Lines to Vizag (470 km).

Water for the mine and associated installations are supplied from dams over Bacheli Nalah, Sankini Nalah and Galli Nallah for Deposit 11A. Water for the mine and associated installations are supplied from dams over Kirandul Nallah and Malinger Nallah for Deposits 14 & 11C.

The area had been initially explored by IBM in 1962-64. NMDC Ltd is carrying out detailed exploration of the area since 1965. NMDC Limited commenced its operations in Bailadila sector in 1968 at Dep.-14 ML area. Mining Lease completely falls in Bailadila Reserved Forest. This mining lease is worked as a part of Bailadila Iron Ore Mine Kirandul Complex. The present top RL of 11ML Bailadila ridge is 1276 M.

b) Regional Geology

The concern area is a part of Bailadila Range which is trending roughly N-S directions with steep easterly dip (45°-75°). These are two sub-parallel mountainous ridges of length 38 Km’s & width 4 Km’s approximately. These ridges merge and coalesce into one ridge in the north of Dep.-10 and from where the intervening valley (Galli nallah) gradually widens southwards and is at its widest roughly between Deposit-11C and Deposit-5.

On the basis of detailed geological mapping the local stratigraphic sequence has been established for Bailadila Iron Ore Series.

Bailadila Hills represents the type area of southernmost part of Kotri-Dongargarh orogen of Bastar craton known as Bailadila group (Age : 2400 Ma). Quartzites & Chlorite phyllites (olive green), Loa Conglomerates and superior – type Banded Iron Formation in association with Fine clastics, tuffs and basic volcanics are the main characteristics of this group. The basal Felspathic Quartzite is cross-beded with thin intercalations of phyllites & meta siltstone and locally underlain by
phyllitic conglomerate. At places the phyllites are carbonaceous and resemble Black Shale. Sills of (ultra) Mafic rocks are found in thick phyllites and Dykes are common in contact shale with thick Iron formations. Iron formations are rich in Hematite and Martite. Litho formations of Bailadila group are N-S trending. Sukma group and Bengal group are swept in parallelism with the Bailadila Hills to the west of Geedam. Bengal group remained the base during major Bailadila deformation.

The regional sequence of Bailadila Iron Ore Series is presented below:

<table>
<thead>
<tr>
<th>Period</th>
<th>Deposits</th>
<th>Lithology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precambrian</td>
<td>Bailadila Iron Ore Series</td>
<td>Dolerite, Pegmatite, Charnokites, Granite, Green stone &amp; Amphibolites</td>
</tr>
<tr>
<td></td>
<td>Banded Hematite Quartzite and Shale, with associated iron-ore deposits</td>
<td>Grunerite, Quartzite, Ferruginous phyllite, etc., White Quartzite</td>
</tr>
<tr>
<td></td>
<td>Bengal Series</td>
<td>Brecciated Ferruginous Schist, Schistose conglomerates etc.</td>
</tr>
<tr>
<td></td>
<td>Archaean</td>
<td>Slate &amp; Shale With andalusite crystals, sericite Schist and Quartzite</td>
</tr>
</tbody>
</table>

**c) Lithology**

The local stratigraphic sequence of Bailadila Iron ore Series is as follows:

Bailadila iron ore series

- Dolerites
- BIF with associated iron ores
- Ferruginous Shale
- Schist

In the Mining area --

Iron ore, formed due to enrichment of iron by leaching of silica from BHQ by supergene enrichment is occurring as the main ore type “Hematite”. Iron ore is mainly available as soft (as Blue Dust); homogeneous, massive/ hard and compact steel grey and hard to medium hard blue hematite form.

Waste is shale appearing as independent litho-unit as well as intermittent localized thin bands within hematite. BHQ is occurring as mother rock, usually parallel bands along the strike direction. Shale is soft to medium hard and BHQ is usually inhomogeneous, uneven, compact and hard.

**d) Local Geology**

**Geology of Deposit 11 ML Area:**

**Deposit-11A:**

Total strike length of deposit including North and South pit is 1600 m between cross sections CS11 to CS 26 trending almost N-S however the total length of
the deposit is 2.59 kms. The average width is about 680 meters and depth is 73.66 meters (max 155 mtr's and min. 28 mtr's) as per exploratory bore holes.

- Max. Width of ore body N-Block (CS11 to CS 19) is about 700 mtr's with Dip 570 to 770 Easterly. Ore body follows Lateritic ore as capping, blue Hematite, laminated ore, sub surface Blue Dust and bottom shale bands. Max. depth of ore body found 155 M in easterly in blue dust.

- Average width of ore body S-Block (CS19 to CS 26) is about 400 mtr's with varying Dips from gentle to sub vertical Easterly. Ore body follows Lateritic capping on slopes, Steel grey Hematite (Photo.no.3), Blue Hematite, , minor Blue dust, with Shale as basement in the west (Photo no,4 ) and BHQ in east(Photo no 2A & 2B). The Maximum depth was 56 M in laminated blue hematite ore was achieved.

- The further southern area beyond CS26 to up to 11B lease boundary is geologically mapped. Steel grey ore body (in west) follows a sharp contact with BHQ (in east) at Bhai-Bahan hills covering tectonically the highest disturbed zone (Photo no.1), Photograph of sub-vertical easterly dipping tight-folds (Photo no.2A -2B).

**Deposit-11B:**

Dep -11B extends over a strike length of 2800 mtr's trending about N-S direction /Dip: 00 (horizontal) to 760 with ave. width of 600 meters varying from 450M (at B 2) to 900 M (at B 7) divided in to three blocks north (B -3 to B 2), central (B 3 to B 14) and south (B 14 to B 23) on the basis of ore body appearance. The ave. depth of ore body as per exploratory bore holes is 75 meters, the max Depth is 185 meters and minimum is 10 meters.

- North Block: Ore body width 250M (B -3 ) to 650 M(B1) following Steel grey Hm/Blue HM (200M),Blue Dust(100 to 200M), Laminated ore (50M) ,Float ore and thick sub vertical BHQ beds from west to east with max. depth up to 70 M dipping 450 to 650 Easterly and occupying the highest peak 1275.58 MRL of Bailadila range. Horizontal beds of BHQ seen at B-3E2 showing recumbent folding evidencing structurally high disturbed zones (Photo no.5). This ore block consists grade wise a very good significant part of reserves, proposed G1 level exploration.

- Central Block: Ore body is uniformly consistent and compact in nature extending for about 1100 M strike length (between cross sections B3 to B14) with maximum width 900M (at B7) & mini. width about 300M (at B12) and appearing separation as hard and soft from SE (B6) to NW(B3) by surface topography and depth. Top RL being 1222 M at cross section B4.
There’s a homogeneously soft ore (Blue dust: +67% Fe) body zone between cross sections B6 to B3 for an average depth 150 M (max.depth:180 M at 1008 M bench RL). There’s a hard ore (steel grey/ Blue Hm, +67% Fe) zone between cross sections B6 to B14 for an average thickness by depth 100 M up to 1080 M bench RL. Ore sequence follows shale (Photo no.10), Laminated blue Hm, Blue Hm (Photo no 11) - Steel grey Hm, (Photo no.13) - Blue dust, Float ore and thick (sub vertical 750 to 850) BHQ beds from West to East. Photograph of eastern BHQ cliff in Photo no.6 There are four no’s parallel NW-SE trending Fault zones (Fault Breccia with hard & compact Blue Hm pieces in west and with Steel grey Hm in east) all over across the ore body (Photo no. 7 &12).

The bottom most bedded formation is shale evidencing contact with laminated Blue Hm with varying dip angle from 450 to 650 easterly between cross section B6 to B14. (Photo no. 8).This ore block consists grade wise a very good Ore of reserves, proposed G2 level exploration. Sub grade siliceous Phyllitic Laminated Blue hematite outcrops are N-S trending parallel to eastern BHQ margin. (Photo no .9).

South Block: Hard ore body is uniformly consistent and compact in nature extending for about 1200M strike length (between cross sections B15/E8 to B23/CAL) with max. width 600M at (B22) & mini. width about 300M (at B15). There’s a thick shale horizon between cross sections B15 to B18 consisting shale mixed lateritic mass so called lateralized shale(photo no.14) gradually followed by thin(1 to 2 M) hard and compact beds of laminated blue Hm on the top. (Photograph no 15). The ore zone is highly folded in nature with dipping limbs 450 to 760 easterly evidencing maximum thickness of laminated ore not more than 35 mtr’s.

A particular sequence of ore body types is appearing between cross sections B19 to B23 like Mixed shaley lateritic mass - laminated BH, Blue Hm, Steel grey Hm, Siliceous Blue dust (Tz: Transition zone) with Float ore at top and thick BHQ beds from West to East : So called Deposit No.12.

Deposit-11C:

The area belongs to the northern part of Dep 14 NMZ ML between cross sections C-2 to C10 for a total length of 1200 Meter’s with average width 350 Mtr’s. The depths as per 63 no’s Bore holes is max.138 Mtr’s and mini. 2 Mtr’s over western shale (average depth is 29.57 meter’s). Ore body is dipping 500 to 760 E. Eastern part is mostly high grade Blue dust.(Photo no. 19) in contact with eastern BHQ cliff.(Photo.no.20). Central and western part to the central axial line follows Blue Hm. Laminated Blue Hm. and shale and eastern floats sequenceally. (Photo no. 16, 17, & 18), the above photographs are given in annexure no.1.26.

Structure

Regional Strike of the main Bailadila Range except the southern ridge (About E-W) is N-S with steep easterly dipping metasedimentary formations. The tightly folded overturned synclines for the two ridges and an eroded anticline occupying
the valley in between (Galli Nallah) account for the regional geometry. The Southern ridge on which Deposit no. 14 and deposit no. 13 occur suggests a closure (extended part of NW-SE Fold) and tightly disturbed due to later superimposed folding. There are two main phases of deformation evidenced in Bailadila Group. The First or the earlier intensive phase with tight folds having N-S to NNE-SSW axes plunging steeply towards the south and northeast the second or the later phase with NW-SE trending folds plunging moderately northwest.

3.5.2 Reserves

The bench wise mineable reserves of Deposit-11A, Deposit 11B and Deposit 11C as on 1/4/2017 are given below:

<table>
<thead>
<tr>
<th>Deposit-11A</th>
<th>Deposit-11B</th>
<th>Deposit-11C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bench</td>
<td>Total quantity (LT)</td>
<td>Bench</td>
</tr>
<tr>
<td>1236</td>
<td>0</td>
<td>1260</td>
</tr>
<tr>
<td>1224</td>
<td>9.54</td>
<td>1248</td>
</tr>
<tr>
<td>1212</td>
<td>16.23</td>
<td>1236</td>
</tr>
<tr>
<td>1200</td>
<td>24.38</td>
<td>1224</td>
</tr>
<tr>
<td>1188</td>
<td>38.96</td>
<td>1212</td>
</tr>
<tr>
<td>1176</td>
<td>50.56</td>
<td>1200</td>
</tr>
<tr>
<td>1164</td>
<td>64.17</td>
<td>1188</td>
</tr>
<tr>
<td>1152</td>
<td>64.68</td>
<td>1176</td>
</tr>
<tr>
<td>1140</td>
<td>68.95</td>
<td>1164</td>
</tr>
<tr>
<td>1128</td>
<td>64.58</td>
<td>1152</td>
</tr>
<tr>
<td>1116</td>
<td>57.65</td>
<td>1140</td>
</tr>
<tr>
<td>1104</td>
<td>46.89</td>
<td>1128</td>
</tr>
<tr>
<td>1092</td>
<td>48.79</td>
<td>1116</td>
</tr>
<tr>
<td>1080</td>
<td>51.58</td>
<td>1104</td>
</tr>
<tr>
<td>1068</td>
<td>52.29</td>
<td>1092</td>
</tr>
<tr>
<td>1056</td>
<td>49.96</td>
<td>1080</td>
</tr>
<tr>
<td>1044</td>
<td>50.50</td>
<td>1068</td>
</tr>
<tr>
<td>1032</td>
<td>44.23</td>
<td>1056</td>
</tr>
<tr>
<td>1020</td>
<td>37.76</td>
<td>1044</td>
</tr>
<tr>
<td>1008</td>
<td>29.57</td>
<td>1032</td>
</tr>
<tr>
<td>996</td>
<td>3.54</td>
<td>1020</td>
</tr>
<tr>
<td>984</td>
<td>0.72</td>
<td></td>
</tr>
<tr>
<td>TOTAL Mineable Reserve</td>
<td>876.43 LT</td>
<td>TOTAL Mineable Reserve</td>
</tr>
<tr>
<td>Fe%</td>
<td>65.38</td>
<td>Fe%</td>
</tr>
<tr>
<td>Total Mineable Waste</td>
<td>125.82 LT</td>
<td>Total Mineable Waste</td>
</tr>
</tbody>
</table>

TOTAL MINEABLE RESERVES = 3,340.78 LT
3.5.3 Mining Method

The mining methodology will comprise of open cast.

ROM Ore Evacuation system – by rail, road & slurry pipeline

3.5.4 Mining

Design Parameters
Bench Height : 12 m
: 12 m
Berm Width : 50 m (Operation phase)
: 15 m (Inactive Phase- Shale & Blue Dust)
: 12 m (Inactive Phase- Hard Formation)

Overall Average Pit Slope : 45 degree
Road Width, Road Gradient, Safety Bund, Turn-outs :
(Note: Design parameters may be modified subject to D.G.M.S. guidelines)

Deposit 11A- Ore: Waste= 1:0.14, Ore: Sub-grade=1:0.032
Deposit 11B- Ore: Waste= 1:0.14, Ore: Sub-grade=1:0.009
Deposit 11C- Ore: Waste= 1:0.80, Ore: Sub-grade=1:0.028

Average one way Lead distance

<table>
<thead>
<tr>
<th>Heading</th>
<th>Deposit 11A</th>
<th>Deposit 11B</th>
<th>Deposit 11C</th>
</tr>
</thead>
<tbody>
<tr>
<td>From Mine Benches to Crushing Plant</td>
<td>2.3 KM</td>
<td>2.0 KM</td>
<td>1.1 KM</td>
</tr>
<tr>
<td>From Benches to Waste Dump</td>
<td>0.9 KM</td>
<td>1.2 KM</td>
<td>1.6 KM</td>
</tr>
</tbody>
</table>

3.5.6 Mining Method

The Bailadila Deposit-11A, Deposit-11B and Deposit-11C mines are fully mechanized mine. The mining operation is carried out using electric rope/hydraulic shovels, blast hole drills, crawler drills, dozers, water sprinklers motor graders etc.,

- Drilling

Drilling for blast hole is done by using 250 mm rotary drills and 150 mm rotary percussive drills, all working on electricity. These drills are capable of drilling up to 16m in hard iron ore formations as the bench heights are 12m, the total meterage drilled per hole is 13.8 m including 15% of sub grade-drilling. The Tricon Roller bits are used for drilling. To suppress dust during drilling water is used. Secondary drilling done by using crawler drills working on compressed air powered by diesel engines.
**Blasting Parameters**

Blast holes for primary blasting are of 250 mm dia. Holes are drilled to a depth of 13.8 m including sub-grade drilling for the bench height of 12 m. Blast holes are drilled in multiple rows (generally 2) in rectangular pattern. Blast hole drilling is being carried out by using 3 blast hole drills 250mm dia.

**Loading**

Blasted ore is loaded from the face by electric rope shovels / hydraulic shovel. The bucket capacity of these electric rope shovels is 4.6 m³ and 8.0 m³ and that of the hydraulic shovel is 5.5 m³. Electric power is supplied to these shovels through moveable PSG (portable switch gear) located at convenient locations in the mine. Shovels load the ore into 50 / 60 / 85/ 100 ton dumpers. The waste excavation is also done by these shovels depending upon the excavation plan.

**Haulage**

The ore loaded into the rear dumpers is carried to the crushing plant, through the haul roads. The Dumper Platform at Deposit-11A mines is at a RL of 1120 m. The Dumper Platform at Deposit-11B mines is at a RL of 1120 m. The dumper platform at Deposit-11C mine is at a RL of 1050 m. The load is hauled up the gradient for a distance of 2-3 km from the mine to the dumper platform / Crushing Plant on a haul road laid with 1 in 16 gradient. Water sprinkling by 28 KL capacity water tanker is done on the haul road for ensuring effective dust suppression. From ore crushing plant to screening plant to loading plant, ore is transported by belt conveyor system. Processed ore from stockpile (at loading plant) to main destination Visakhapatnam (475 km) is done by rail route.

**Machinery Details**

**LIST OF MINING EQUIPMENTS: Deployed in Dep-11 A**

**DRILLING MACHINES**

<table>
<thead>
<tr>
<th>Type</th>
<th>No.s</th>
<th>Dia. Of hole (mm)</th>
<th>Size/ Capacity</th>
<th>Make</th>
<th>Motive Power</th>
<th>H.P.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blast Hole Drills</td>
<td>03</td>
<td>250</td>
<td>14 m drilling (in use)</td>
<td>IR/Atlas copco.- IDM70E</td>
<td>Electrici ty</td>
<td>450</td>
</tr>
<tr>
<td>Crawler Mounted Drill</td>
<td>01</td>
<td>100</td>
<td>---</td>
<td>Atlas Copco</td>
<td>Diesel</td>
<td>300</td>
</tr>
<tr>
<td></td>
<td>01</td>
<td>100</td>
<td>---</td>
<td>Atlas Copco</td>
<td>Diesel</td>
<td>180</td>
</tr>
</tbody>
</table>

**LOADING MACHINES**

<table>
<thead>
<tr>
<th>Type</th>
<th>No.s</th>
<th>Bucket capacity in Cu.m.</th>
<th>Make</th>
<th>Motive Power</th>
<th>H.P.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shovel</td>
<td>02</td>
<td>8.0</td>
<td>Hitachi EX 1900-6</td>
<td>Diesel</td>
<td>1024</td>
</tr>
<tr>
<td>Front</td>
<td>01</td>
<td>8.0</td>
<td>CAT 992K</td>
<td>Diesel</td>
<td>801</td>
</tr>
</tbody>
</table>
HAULAGE MACHINES

<table>
<thead>
<tr>
<th>Type</th>
<th>No.s</th>
<th>Size/capacity</th>
<th>Make</th>
<th>Motive Power</th>
<th>H.P.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dumper</td>
<td>07</td>
<td>85 tonne</td>
<td>BEML BH 85-1</td>
<td>Diesel</td>
<td>883</td>
</tr>
</tbody>
</table>

Dumpers are fitted with exhaust conditioners.

MISCELLANEOUS MACHINES

<table>
<thead>
<tr>
<th>Type</th>
<th>Make</th>
<th>Motive Power</th>
<th>Nos.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulldozer Crawler Mounted</td>
<td>BEML D 355 A</td>
<td>416 HP</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>D11T</td>
<td>801 HP</td>
<td>1</td>
</tr>
<tr>
<td>Wheel Dozer</td>
<td>L &amp; T KOMATSU-WD 600</td>
<td>485 HP</td>
<td>1</td>
</tr>
<tr>
<td>Motor Grader</td>
<td>BEML BG825A</td>
<td>280</td>
<td>02</td>
</tr>
<tr>
<td>Water Sprinkler</td>
<td>BEML WS 28-2</td>
<td>28 KL</td>
<td>3</td>
</tr>
<tr>
<td>Back Hoe</td>
<td>L &amp; T Komatsu</td>
<td>90 HP</td>
<td>1</td>
</tr>
<tr>
<td>TIL / Omega Crane</td>
<td>TIL-830M</td>
<td>30 T</td>
<td>1</td>
</tr>
<tr>
<td>Escort Crane</td>
<td>ESCORTS-8000</td>
<td>8 T</td>
<td>2</td>
</tr>
<tr>
<td>Mobile Lubricating Van</td>
<td></td>
<td>110 HP</td>
<td>01</td>
</tr>
<tr>
<td>Truck</td>
<td></td>
<td>110 HP</td>
<td>01</td>
</tr>
<tr>
<td>Explosive Van</td>
<td></td>
<td>110 HP</td>
<td>01</td>
</tr>
<tr>
<td>Water Tanker</td>
<td></td>
<td>110 HP</td>
<td>01</td>
</tr>
<tr>
<td>Diesel Tanker</td>
<td></td>
<td>110 HP</td>
<td>01</td>
</tr>
</tbody>
</table>

Dep.10&11A is a single working mine so the same fleet of machinery are going to be utilized in both the mines

LIST OF MINING EQUIPMENTS: Deployed in Dep-11 B

DRILLING MACHINES

<table>
<thead>
<tr>
<th>Type</th>
<th>No.s</th>
<th>Dia. Of hole (mm)</th>
<th>Size/Capacity</th>
<th>Make</th>
<th>Motive Power</th>
<th>H.P.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blast Hole Drills</td>
<td>01</td>
<td>150</td>
<td>14 m drilling (in use)</td>
<td>IR/Atlas copco.-IDM45D</td>
<td>Diesel</td>
<td>480</td>
</tr>
<tr>
<td></td>
<td>01</td>
<td>250</td>
<td></td>
<td>Revathi Equipment Limited</td>
<td>Electricit y</td>
<td>554</td>
</tr>
<tr>
<td>Crawler Mounted</td>
<td>01</td>
<td>100</td>
<td>---</td>
<td>ATLAS COPCO/IR-ICM341</td>
<td>Diesel</td>
<td>300</td>
</tr>
</tbody>
</table>
LOADING MACHINES

<table>
<thead>
<tr>
<th>Type</th>
<th>No.s</th>
<th>Bucket capacity</th>
<th>Make</th>
<th>Motive Power</th>
<th>H.P.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shovel</td>
<td>01</td>
<td>5.5 cum</td>
<td>BEML BE-1000</td>
<td>Diesel</td>
<td>545</td>
</tr>
<tr>
<td>Front End Loader</td>
<td>01</td>
<td>8.0 cum</td>
<td>CAT 992K</td>
<td>Diesel</td>
<td>801</td>
</tr>
</tbody>
</table>

HAULAGE MACHINES

<table>
<thead>
<tr>
<th>Type</th>
<th>No.s</th>
<th>Size/capacity</th>
<th>Make</th>
<th>Motive Power</th>
<th>H.P.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dumper</td>
<td>02</td>
<td>50 tonne</td>
<td>BEML BH 50 M</td>
<td>Diesel</td>
<td>700</td>
</tr>
<tr>
<td></td>
<td>04</td>
<td>85 tonne</td>
<td>BEML BH 85-1</td>
<td>Diesel</td>
<td>986</td>
</tr>
</tbody>
</table>

Dumpers are fitted with exhaust conditioners.

MISCELLANEOUS MACHINES

<table>
<thead>
<tr>
<th>Miscellaneous Operations</th>
<th>Bulldozer Crawler Mounted</th>
<th>BEML BD 355</th>
<th>416 HP</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor Grader</td>
<td>BEML BG825A</td>
<td>280</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>Water Sprinkler</td>
<td>BEML WS 28-2</td>
<td>28 KL</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>Escort Crane</td>
<td>ESCORTS C-8000</td>
<td>11 T</td>
<td>01</td>
<td></td>
</tr>
</tbody>
</table>

Note: All above equipment are owned by the NMDC Ltd and are diesel operated.

LIST OF MINING EQUIPMENTS: Deployed in Dep-11C
(Common for Dep-14 NMZ & Dep-11C part of 11ML)

DRILLING MACHINES

<table>
<thead>
<tr>
<th>Type</th>
<th>No.s</th>
<th>Dia. Of hole (mm)</th>
<th>Size/Capacity</th>
<th>Make</th>
<th>Motive Power</th>
<th>H.P.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blast Hole Drills</td>
<td>04</td>
<td>250</td>
<td>14 m drilling (in use)</td>
<td>IR/Atlas copco.-IDM70E</td>
<td>Electricity</td>
<td>450</td>
</tr>
<tr>
<td>Crawler Mounted Drill</td>
<td>01</td>
<td>100</td>
<td>---</td>
<td>Atlas Copco</td>
<td>Diesel</td>
<td>300</td>
</tr>
<tr>
<td></td>
<td>02</td>
<td>100</td>
<td>---</td>
<td>ATLAS COPCO/IR-ICM341</td>
<td>Diesel</td>
<td>---</td>
</tr>
</tbody>
</table>

LOADING MACHINES

<table>
<thead>
<tr>
<th>Type</th>
<th>No.s</th>
<th>Bucket capacity in Cu.m.</th>
<th>Make</th>
<th>Motive Power</th>
<th>H.P.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shovel</td>
<td>03</td>
<td>8.0</td>
<td>BEML 182M</td>
<td>Electric</td>
<td>800</td>
</tr>
<tr>
<td></td>
<td>01</td>
<td>8.0</td>
<td>TZ WK-10B</td>
<td>Electric</td>
<td>750</td>
</tr>
</tbody>
</table>

HAULAGE MACHINES
Dumpers are fitted with exhaust conditioners.

MISCELLANEOUS MACHINES

<table>
<thead>
<tr>
<th>Miscellaneous Operations</th>
<th>Bulldozer Crawler Mounted</th>
<th>Front End Loader (8CuM)</th>
<th>Motor Grader</th>
<th>Water Sprinkler</th>
<th>TIL / Omega Crane</th>
<th>Escort Crane</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEML D 355</td>
<td>D11T</td>
<td>CAT 992K</td>
<td>BEML BG825A</td>
<td>BEML WS 28-2</td>
<td>TIL-830M</td>
<td>ESCORTS-8000</td>
</tr>
<tr>
<td>416 HP</td>
<td>801 HP</td>
<td>801 HP</td>
<td>280</td>
<td>28 KL</td>
<td>30 T/ 75 T</td>
<td>11 T</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>1</td>
<td>02</td>
<td>04</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

Note: All above equipment are owned by the NMDC Ltd and are diesel operated.

3.5.8 Production Capacity and Distribution

<table>
<thead>
<tr>
<th>Deposit</th>
<th>Present capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dep.11A</td>
<td>2.8 MTPA</td>
</tr>
<tr>
<td>Dep.11B</td>
<td>7.0 MTPA</td>
</tr>
<tr>
<td>Dep.-11C</td>
<td>1.5 MTPA</td>
</tr>
</tbody>
</table>

CLO and Lump will be salable product. Approximately, the lump and fines production will be in the ration of 30: 70. Slime loss will be approximately 5 to 6%.

Annual Production Schedule up to life of mine

<table>
<thead>
<tr>
<th>S. no</th>
<th>Year</th>
<th>Deposit 11A</th>
<th>Deposit 11B</th>
<th>Deposit 11C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2018-19</td>
<td>0.3</td>
<td>0.042</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>2019-20</td>
<td>0.3</td>
<td>0.042</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>2020-21 to 2024-25 (5 Years)</td>
<td>14</td>
<td>1.96</td>
<td>31</td>
</tr>
<tr>
<td>4</td>
<td>2025-26 to 2029-30 (5 Years)</td>
<td>14</td>
<td>1.96</td>
<td>35</td>
</tr>
<tr>
<td>5</td>
<td>2030-31 to 2034-35 (5 Years)</td>
<td>14</td>
<td>1.96</td>
<td>35</td>
</tr>
<tr>
<td>6</td>
<td>2035-36 to 2036-37 (2 Years)</td>
<td>5.6</td>
<td>0.784</td>
<td>14</td>
</tr>
</tbody>
</table>
3.5.9 Existing Ore Processing at Deposit 11A, 11B & 11C Mine

Deposit 11A material is fed into Crushing plant at 10 ML, which is earmarked for both deposit 10 and deposit 11A material.

Crushing Plant 10&11A: Primary and secondary crushing of ore is being done at the hilltop. The capacity of primary crusher is 2500 ton/hr. Run-off mine Iron ore (-1200 mm) from Deposit-10 and 11A is sent to crusher site by 85-tonne heavy duty dumpers. The Dumper Platform is at a RL of 1120 m.

Crushed iron ore of (-) 350 mm size from primary gyratory crusher of 54" x 74" size is sent to secondary crusher using belt conveyors. The oversize from the scalping screen is fed to secondary 7" cone crusher. The crushed product and undersize of scalping screen (-) 150 mm are sent to hilltop silo (1500 tons capacity) using belt conveyor no. 1012.

Note- The above crushed product of –150 mm size is stacked at silo (1500 Tons Capacity), below Crushing Plant from where it is retrieved with the help of vibrating feeder and discharged onto another three no. silo( each having a capacity of 5000 Tons) above the screen plant where down hill conveyor join and feed the ROM (-150 mm) to screen plant.

Down Hill Conveyor System: The material from hill top silo is fed to downhill conveyors through apron feeder. 3 number storage silos (each silo capacity 4500 tons) are located at the foot hill-Bacheli. The downhill conveyors are regenerative conveyors equipped with multiple drives having fail safe electro hydraulic thrusters operated drum brakes. The total length of downhill conveyor system is approximately 1622 m.

Screening Plant 10&11A:
The material from the intermediate silo is fed to the respective screens in screening building through apron feeders & belt conveyors. As per requirement, the ore is washed with water under pressure though nozzles controlled by solenoid valves at primary and secondary screens. The water is drawn from reservoir RWR -1 & RWR-2 situated above the intermediate silo level through water pipes provided with motorised valves.

In the screening plant the ROM ore is fed to double deck primary screens with 60mm top deck and 25 mm bottom deck. The undersize ore passes to the secondary screens with 10 mm top decks and 3mm bottom deck. Water jets are used for wet screening. The -150 +10mm fraction of the ore is classified as Lump Ore. Whereas -10 mm of the ore is classified as Fine ore during dry screening process.
Presently screening plant 10&11A is operated in Dry circuit.

**Ore Processing Infrastructure of 11B &11C**

The ROM of Deposit 11B is fed into crushing plants located in Dep-11 ML from where it is transported to Screening Plants (SP-I and SP-II) located in the adjacent mining lease 14 NMZ.

The ROM of Deposit 11C is fed into crushing plants and Screening Plants (SP-I and SP-II) located in the adjacent mining lease Deposit-14 NMZ.

There is no specific beneficiation process adopted. However, during dry screening the appreciation in the quality of lump ore is marginal while fine ore does not show any appreciation in quality.

In the screening plants, the ROM ore is fed to double deck primary screens with 50mm top deck and 20 mm bottom deck. The undersize ore passes to the secondary screens with 10 mm top decks and 3mm bottom deck. Water jets are used for wet screening. The −150+10mm fraction of the total ROM ore is classified as Lump Ore. The 3mm portion passes to screw classifiers where fines upto 100 mesh size are separated. The classifier sand of size 3 mm +100 mesh passes through dewatering screens and joins with the −10+3mm product. There is provision for treating the classifier over flow in hydro-cyclones where material upto +200 mesh size could be separated. The −200 mesh material along with water passes to the thickeners for separation of slime from which water is reclaimed.

Two 50 TPH slow speed classifiers have also been installed to separate the cyclone underflow from associated water and then reduce the moisture content. During the dry months of the year, however, dry screening is resorted to keeping in view of the mineral conservation and as such there is no slime disposal during dry months. Part of the lump ore, falling between the size range 30mm and 10mm is separated as calibrated lump ore. The −150+10mm lump ore fraction is fed to tertiary crushing plant. It is a 7’ cone crusher reducing the feed to −30 mm (Calibrated Lump Ore). Tertiary crushing plant has been commissioned during March 2001 in the screening plant premises at Kirandul.

The CLO, Lumps and fine ore is transported by a set of conveyors to loading plant at Kirandul. Screening plant no.1 and Screening plant no.2 including tertiary crushing plant are located in Deposit-14 NMZ mining lease. The capacity of screening plant-I is 5 MTPA and Screening Plant-II is 7 MTPA. The existing equipment flow sheet is enclosed as Plate no: 3.
3.5 **Raw Material Required along with estimated quantity, likely source, marketing area of final product/s, mode of transport of raw material and finished product.**

Since this is a mining project and produces iron ore which is the primary raw material to the steel industry, raw material requirement does not arise. The finished products of iron ore are classified as lump ore and fine ore which are being transported to customers mostly by rail and minor quantity by road.

3.6 **Resource Optimization/ recycling and reuse envisaged in the project, if any, should be briefly outlined.**

In the project, due care shall be taken for optimum use of natural resources and for their conservation. Earlier, the cut-off grade was 55% Fe and as per IBM circular no: 3/2010, cut off grade has been taken as 45% Fe. Mineral occurrence below 45% Fe is classified as waste. Accordingly, reserves and resources have been estimated on the above guidelines and classified as per UNFC.

3.8 **Availability of Water its source, Energy / power requirement and source should be given.**

3.8.1 **Water:**
Water requirement: 1500 KLD.

**Sources of water**
Malangir Nallah / Galli nalla

3.8.2 **Power:**
Power is supplied by Chhattisgarh State Electricity Board from a sub-station at Kirandul and Bacheli where power is stepped down from grid voltage 132 KV to 33 KV and distributed to the different sub-stations of the mine for further distribution and control.

3.9 **Quantity of Waste to be generated (liquid and solid) and scheme for their management / disposal.**

Already covered at item no: 3.5.8 & 6.9.

3.10 **Schematic representations of the feasibility drawing which give information of EIA Purpose.**

**Process Flow Open-cast Mining**
Drilling – Blasting – Excavating – Hauling – Crushing – Screening – Loading - Dispatch
Flow Sheet of Beneficiation Process

Crushing – Screening -Loading

4.0 Site Analysis

4.1 Connectivity:

Bailadila Iron Ore Project Deposit 11ML is located at Kirandul Complex on Bailadila range of hills in South Bastar Dantewada district of Chhattisgarh.

Bailadila is easily accessible and well connected to Raipur, Visakhapatnam and Hyderabad by all-weather roads. It can also be reached by rail from Visakhapatnam. There is regular iron ore movement from this sector to Visakhapatnam port by rail. The railway line, known as Kirandul- Kottavalasa (KK) line runs at the foot hills of Bailadila deposits.

4.2 Land form, Land use and Land ownership

<table>
<thead>
<tr>
<th>EXISTING LAND USE PATTERN</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEADING</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>MINING</td>
</tr>
<tr>
<td>WASTE DUMP/SUB GRADE DUMP</td>
</tr>
<tr>
<td>INFRASTRUCTURE</td>
</tr>
<tr>
<td>BLANK AREA</td>
</tr>
<tr>
<td>TOTAL</td>
</tr>
</tbody>
</table>

Infrastructure includes township, mechanical/electrical/civil installations, office, power transmission lines etc

4.3 Topography (along with map)

Bailadila range is a group of hills of about 40 km in length and 10 km wide. The highest peak of the area is about 1276 m AMSL and the entire range approximately forms ‘Y’ shape, with the tip pointing to north direction. The lower undulating plains of elevation varying from 300-m to 400-m and has occasionally hills rising up to 600 m.
Geo-morphologically, the terrain is characterized by relic hill ridges with cliffs due to hard resistant ore body or iron formations, duricrusts or terraces formed by laterisation at elevations of around 1000 to 1100 m AMSL and deflected profile due to the above.

4.4 Existing Land use Pattern (agriculture, non-agriculture, forest, water bodies (including area under CRZ)), shortest distance from the periphery of the project to periphery of the forests, national park, wildlife sanctuary, eco-sensitive areas, water bodies (distance from the HFL of the river), CRZ. In case of notified industrial area, a copy of Gazette notification should be given.

The entire land of mining lease area belongs to Forest land and forest clearance under section 2 of F.C. Act, 1980 obtained from MoEFCC, GoI. The land adjacent to mining lease areas also falls under reserve forest of Bailadila. No National park, wildlife sanctuary, eco-sensitive areas exist within 10km radius of mining leases of Kirandul complex. The shortest distance from the periphery of the project to water bodies is given below:

<table>
<thead>
<tr>
<th>S. no</th>
<th>Name of water body</th>
<th>Shortest aerial distance in Kms from periphery of lease area</th>
<th>Direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kirandul Nalla</td>
<td>Within lease area</td>
<td>----</td>
</tr>
<tr>
<td>2</td>
<td>Malingger Nalla</td>
<td>4.5</td>
<td>SSE</td>
</tr>
<tr>
<td>3</td>
<td>Galli Nalla</td>
<td>1.1</td>
<td>West</td>
</tr>
<tr>
<td>4</td>
<td>Koyar Nadi</td>
<td>4.9</td>
<td>NE</td>
</tr>
</tbody>
</table>

4.5 Existing Infrastructure

- Ore screening cum beneficiation Plant
- Quality Assurance laboratory
- Central Workshop
- Explosive magazine
- Effluent Treatment Plants
- Drinking Water supply system.
- Sewage Treatment Plant
- Weigh Bridges
- Central Store
- Administrative Office
- Security Control & Fire Fighting Station and
- Electrical Substations
- Workmen canteen
- Township, Hospital, Shopping complex, Religious places, etc.
- RO treatment plant

As this is an existing project, the necessary infrastructure is already available.
**Roads:** The area is well connected by all weather road from Raipur, Visakhapatnam and Hyderabad.

**Railway:** There is regular iron ore movement from this sector to Visakhapatnam port by rail. The railway line, known as Kirandul-Kottavalaasa (KK) line runs at the foot hills of Bailadila deposits.

### 4.6 Soil Classification

The soil texture is of sandy loam with the sand content from 63-70%.

### 4.7 Climatic Data from secondary sources.

The climatic condition of this area is semi-arid. The maximum temperature goes up to 40°C during summer in the month of May and the minimum temperature goes down to 11°C during winter in the month of December and January. The average humidity in the area ranges from 20 to 55%. The average annual rainfall recorded in the area is about 2600mm, about 85% of which is falling between July and September due to the SW monsoon. During the monsoons and pre-monsoon cyclone seasons, the wind velocities touch as high as 60 to 70 kmph on Beaufort’s scale. In general, the most predominant wind velocities fall in the range of 19-29 kmph with southwest and northeast forming the predominant directions. One automatic weather monitoring station was established at Hill top, Kirandul.

### 4.8 Social Infrastructure:

NMDC has given social benefits to the surrounding population in the form of standard educational facilities, roads, communication facilities, transportation, marketing, banking, postal services, health facilities, directly or indirectly. The civic amenities have already been developed due to existing mines in Kirandul complex. A township at Kirandul is very well developed.

### 5.0 Planning Brief

#### 5.1 Planning Concept (type of industries, facilities, transportation, etc) Town and Country Planning / Development authority classification

This is an existing project. The iron ore mining operations in Bailadila Deposit-11 M.L are fully mechanized opencast mines. The mines adopt using shovel dumper combination and various process involved are drilling, blasting, excavation, quality control, ore processing (crushing & screening), loading of products, sub grade stockpile and waste disposal.

Drilling is done with blast hole drills. Blasting is done with SME explosives. The blasted material of size less than 150mm is excavated using Shovel (4.6 / 8 m³ capacity) and unloaded into dumpers of 50/85/100 Ton capacity. The dumpers carry the material on designated haul roads to dumper platform where dumpers unload the material into gyratory crusher. The mined ore from Dep-11A mine, 11B mine and 11C mines transported to respective crushing plants located at...
Bailadila Deposit-10 M.L., Deposit-11 M.L and Deposit-14 NMZ Mining lease areas. At the crushing plant, the ore is reduced in size to ~150 mm. The haul roads have maximum gradient of 1 in 16. Berms of 10-12 meters are left out at worked out benches maintaining over all bank slopes of 45 or less. In laterite and blue dust areas the width of the berm is increased to 20 meters for safety and bench height is kept at 10 meters.

The crushed Iron ore material is transported through closed downhill conveyor system to screening plants-I / II located at Kirandul for Deposit-11B & 11C and to screening plant-II located at Bacheli. The sizing of ore is done in the plant to separate the ore into Lump ore (minus 150mm & plus 10mm), CLO (30/40 to 10mm), Fine ore (below 10mm). The above products are transported through closed downhill conveyor system to Loading plants at Kirandul (for Dep-11B & 11C) and at Bacheli (for Dep-11A) where stacking and reclamation is done through mechanized way. Lump & fine ore is reclaimed mechanically and loaded into the Railway wagon at the Loading Plant. The iron ore material from hill top to loading plant is transported through closed down hill conveyor system.

The following facilities available at Kirandul / Bacheli complex shall be utilized for Deposit-11ML for iron ore mining operations at Deposit-11A, 11B and 11C.

**Service Centre:** There are Service Centre close to the Dep.-11A, Dep.-11B & Dep.-11C pits for maintenance, servicing and repair of all mining machinery. Skilled manpower is available at Service Centre to attend to the heavy and light mobile machines at their respective sites.

**Power Supply:** Power is supplied by Chhattisgarh State Electricity Board from a sub-station at Kirandul and Bacheli where power is stepped down from grid voltage 132 KV to 33 KV and distributed to the different sub-stations of the mine for further distribution and control.

**Water Supply:** Water is obtained from Kirandul Nala, Bacheli Nala and Malangir Nala. Dams have been constructed over Kirandul Nala and Malangir Nala and water is pumped to corresponding reservoirs. Water from Bacheli Nala is obtained through pipe line by gravity flow.

**Administrative & Site Offices:** The main administrative office is located at Kirandul and Bacheli where P & T telephone, telefax and wireless communication facilities are also available. There are also site offices at Dep.-11A, Dep.-11B & Dep.-11C Mines. Site offices are also maintained at the Service Centre and each of the plant sites.

**Central Stores:** The Main Central Stores Depot is located within the Service Centre of Kirandul Complex and Bacheli Complex. Fuel is stored at both Kirandul and Hilltop Depots and Central Stores which is used for equipments of Dep.-11B & Dep.-11C. Fuel is stored at both Bacheli and Hilltop Depots and Central Stores which is used for equipments of Dep.-11A.
**Geological Sampling Laboratory:** A geological sampling laboratory is functioning at Kirandul and Bacheli separately for sampling of the products and dispatches of the iron ore from the projects. This laboratory is equipped with Jaw Crusher, pulverisers, sieve shakers and other sampling equipment for processing and preparation of various types of samples. Core Library is also maintained at hilltop and exploration section is deployed for exploratory works.

**Chemical Laboratory:** A chemical laboratory is also located at Kirandul and Bacheli separately for carrying out chemical analysis of various types of samples of iron ore produced and dispatched from the project.

Some of the equipment available are:
- Inductively coupled plasma spectrometer
- Atomic absorption spectrophotometer
- B.O.D. Incubator
- Turbidity Meter
- pH meter etc.

**Canteen Facilities:** Canteens are provided separately for mine and main administrative building at Kirandul and Bacheli Complex. Mobile Canteen Vans carry and supply refreshment to the workmen at their work sites.

**Vocational Training Centre:** Vocational Training Centres are functioning at Kirandul and Bacheli for imparting training on various aspects of safety and first aid and for imparting professional training to the regular employees, fresh graduates and diploma holders from various universities / institutions in the field of mining, geology, mechanical, electrical etc.

**Medical Facilities & First Aid Centres:** Adequate medical facilities including Occupational Health Centre are available in the hospital maintained by NMDC in Kirandul Township and in Bacheli Township. In case of need, the patient may be referred in super specialty hospitals in cities all over India with whom NMDC has tied-up. First Aid Centres are maintained at each important work site.

### 5.2 Population Projection

Kirandul is a Municipality city in district of Dantewada, Chhattisgarh. The Kirandul Municipality has population of 18,887 of which 9,776 are males while 9,111 are females as per report released by Census India 2011. Population of Children with age of 0-6 is 2317 which is 12.27 % of total population of Kirandul (M). In Kirandul Municipality, Female Sex Ratio is of 932 against state average of 991. Moreover Child Sex Ratio in Kirandul is around 1015 compared to Chhattisgarh state average of 969. Literacy rate of Kirandul city is 84.00 % higher than state average of 70.28 %. In Kirandul, Male literacy is around 90.58 % while female literacy rate is 76.86 %. The population has risen primarily after commissioning of the NMDC project here.

Bacheli is a town and a Nagar Palika in Dantewada district in the state of Chhattisgarh. It is now very well known as NMDC Township. As of 2011[update] census, Bade Bacheli had a population of 21,435. Males constitute 52% of the
population and females 48%. Bade Bacheli has an average literacy rate of 78.3%, higher than the national average of 74.04. 13% of the population is under 6 years of age. The population has raised primarily after commissioning of the NMDC project here.

5.3 **Land use Planning (break up along with green belt)**

The land use plan is given in Section-4.2.

5.4 **Assessment of Infrastructure Demand:**

Many of the infrastructure exits, no such significant change in the physical and social infrastructure are being envisaged. However the same can be enhanced as per future requirement after the expansion of mining operation takes place.

5.5 **Amenity/ Facility**

The existing amenities/ facilities like canteen, dispensary, VT centre, Drinking water supply, communication etc have been provided to the employees and communities are sufficient in the present context. However, additional requirement if any shall be provided in future as per the needs perceived as the project progresses or otherwise statutorily required.

a) **Administrative office / Mines office**

This will serve as the administrative office for the mine and supervision of the mining operations. The facilities will include vocational training centre, mine planning & quality control cell, central stores, core library, environment cell etc. Besides the above, some facilities will be provided for this mine. These are given below:

b) **Blasting shelter**

Portable blasting shelters have been provided. Additional shall be provided.

c) **Lighting arrangements**

Adequate portable lighting arrangements will be made at the mine faces in addition to present. The main power source will be drawn from CSEB Raipur.

d) **Rest Shelter**

Adequate arrangement have been made.

e) **Residential facilities**

Already provided within and outside the lease area. Suitably planned.
6.0 Proposed Infrastructure

6.1 Industrial Area

The existing mine lease is having all the Infrastructure facilities like mine office including geology office canteen and dispensary, beneficiation plant, workshop garage, power substation, diesel general shed, magazine, vocational training center, ETP, administrative building, etc. The same facilities will cater the requirements of the proposed expansion. Additional infrastructure shall be provided.

6.2 Residential Area

The proposed capacity expansion of the mines has been envisaged by utilizing the existing infrastructure and man power only. Hence, there is no proposal for the requirement of any additional area for residential purpose.

6.3 Green Belt

Plantation has already been carried out in the available blank area of all the leases. Further, plantation has also been carried out outside ml areas and also participating in Chhattisgarh Hari Har (road side tree plantation) programme through Van Vikas Nigam Limited.

6.4 Social Infrastructure

NMDC has been contributing towards development of social infrastructure in the nearby areas for villagers as well as inside Lease area for employees. The same shall be continued.

6.5 Connectivity (Traffic and Transportation Road / Rail / Metro / Water ways)

The area is connected by all-weather road to district head quarter Dantewada. The area is also very well connected to Jagdalpur AND Raipur in C.G state and Visakhapatnam in A.P and Hyderabad in Telangana. Rail service is available Visakhapatnam from Kirandul. Rail service is also available up to Bubaneshwar in Orissa from Jagdalpur.

6.6 Drinking Water Management (source and supply of water)

Drinking water is sourced from perennial Malinger / Bacheli Nallah with gravity system. Water treatment plant is existing for treatment of raw water for supply to Township and other places.

6.7 Sewerage System
Adequate sewerage system is already in place. Domestic wastewater is given natural treatment in 2 no.s of Oxidation Pond. A separate proposal for construction of modern STP on SBR technology basis is under process.

6.8 Industrial Waste Management

Industrial waste like steel scarp and used oil drums is being sold to authorized recyclers.

6.9 Solid Waste Management

- It is estimated that 80.2 MT of waste will be generated during entire life of mine. Waste rock material shall be dumped at identified locations as per approved mining plan.
- The overall slopes of the dump will be maintained 28°.
- Individual bench height will be restricted to 30m, gullies will be provided in the bench slopes for smooth draining of water.
- Terracing will be made to control surface runoff in the dump slope
- Garland drain have been provided around the dumps
- Barrier has been erected around the dump yard.
- The dump slope has been vegetated with grasses for binding soil and to arrest soil erosion.
- Later on bushes and shrubs has been grown on the dump slopes along with tree species, waste disposal/reclamation is carried with full environmental consideration.
- Geotextile mating will be provided on dump slopes
- The tailings generated from the beneficiation process, if any, shall be stored in the existing tailing pond.

6.10 Power Requirement & Supply/Source

Power Requirement & Supply/Source is given in 3.8.2.

7.0 Rehabilitation & Resettlement (R&R) Plan

Not Applicable:

The entire project is located in forest land, forest permission under section 2 of F.C. Act, 1980 has already been sought.

8.0 Project Schedule & Cost Estimate

8.1 Likely date of start of construction and likely date of completion (Time schedule of the project to be given)

Not Applicable.(This is an existing project)

8.2 Estimated project cost along with analysis in terms of economic viability of the project

Not Applicable.(This is an existing project)
9.0 **Analysis of Proposal (Final recommendation)**

9.1 **Financial & Social Benefits with special emphasis on the benefit to the local people including tribal population, if any in the area.**

As, it is an existing project, the following benefits have been extended to the local people including tribal population by means of employment, corporate social responsibility etc with the existing project. The same have been extended for the future also with the capacity expansion of the project.

Facilities of consumer co-operatives are extended to tribals:

- A marketing place with facilities for night stay is created and same is regularly being used by adivasis;
- Adivasis got the opportunity to film shows, cultural activities and participation in the local games/sports;
- A number of adivasis are employed in the tree plantation programmes of the projects;
- Project has provided hand pumps, wells and storage facility for drinking water at a number of villages;
- All weather roads have been constructed to nearby villages such as Bade Bacheli (2.5 km), Nerli (1.5 km), patelpara (2 km) etc;

**Employment to Local People**

NMDC Ltd. has since its inception been striving to provide maximum employment to the local people. The Bailadila Iron Ore Projects have been giving first preference to local people in its recruitment to group C and D posts. The projects have been obtaining sponsorship from the local employment exchange for all the group C and group D posts and have been exclusively selecting candidates sponsored by the local employment exchange. Only in the event of non-availability of a suitable candidate with the employment exchange, does the project go in for selection of candidates from other areas.

In order to improve the technical skills of the local youth, apprentice training is also being extended to them every year. NMDC Ltd. is also running an Industrial Training Institute (ITI) at Bhansi for development of the skills of the local youth. The setting up of Bailadila Complex has given a total face-lift to the district, which is perhaps one of the most backward districts in the country. The local youth are being trained and employed in highly sophisticated jobs such as dumper operators, Shovel operators and drivers.

The various ancillary units supplying parts etc. to the projects are also sources for providing employment to the local people. Most of the employees of such ancillary units and also those contractors employed for various works by the projects are locals and being principal employer, the projects have been ensuring that the statutory benefits are being paid to these employees too.
The projects have also set up a local market for the local people to sell their produce to the consumers. In this market, platforms have been built enabling them to keep their produce/vegetables etc. and this has become a good source of livelihood for the local people.

Contribution of NMDC towards Corporate Social Responsibility:

NMDC Ltd. has been making continuous efforts to provide necessary facilities to the local tribal since beginning. Earlier, it was under the welfare activities and subsequently, a new budget head (known as Peripheral Development Programme) has been introduced and the expenditure incurred against such welfare activities are booked under the budget head of Peripheral Development Programme of respective financial year in each project.

The activities which are undertaken by NMDC Ltd. towards Corporate Social Responsibility can be broadly classified as:

1. Education;
2. Roads & Buildings;
3. Health;
4. Drinking Water and;
5. Miscellaneous
क्रमाङ्क एक 4-55/2017/XII.

प्रति,

संधीता,

हृदयाश्व सखा, तथा खातक छाती भाग,

हृदयाश्व सन्मित, कस्कर-१,

हृदयाश्व मन, नया रामपुर।

विशेष – जिला वक्रण कस्कर देखारा, बैलाबिला किरिमुज्जिल नं. 11, रकम 874,924, इसके पास खातक छाती भाग अर्थक का खातक ग्राहक नौकरी करने वाले मजदूर नजरबाई से मनोरम देखारा कॉमर्सेशन किरिमुज्जिल का आवेदन पर प्रियवाद 09.09.2016.


युपयोगी संदर्भ में प्रयास करें, विशुद्ध द्वारा संख्यक महापत्र सेवाएं वैशाली कॉमर्सेशन लिमिटेड द्वारा दिल्ली-देखारा कस्कर देखारा अवश्य बैलाबिला किरिमुज्जिल-11 के मुख्य रकम 874,924 हेडेक्टर क्षेत्र पर खातक छाती भाग अर्थक का खातक ग्राहक नौकरी करने वाले प्रश्न प्राप्त करतीं। प्रतिवेदन 09.09.2016 तक खातक के निर्णय के अनुसार प्रतिवेदन गरिया गया है।

2/ NMDC के लिए संचालन शासन के आवेदन द्वारा बैलाबिला किरिमुज्जिल-11 के मुख्य रकम 1809.23 हेडेक्टर क्षेत्र पर 30 वर्ष की अवधि के लिए जिला देखारा अवश्य रकम 874,924 हेडेक्टर क्षेत्र पर खातक छाती भाग अर्थक का खातक ग्राहक नौकरी करने वाले प्रतिवेदन दिनांक 11.09.1997 को दिया गया था।

3/ NMDC के प्रस्तर नौकरी करने शासन दिनांक 16.05.1996 के प्रतिवेदन द्वारा निर्देशन द्वारा क्रमांक को संचालन क्षेत्र 852.218 हेडेक्टर को छोटकर क्षेत्र 874,924 हेडेक्टर क्षेत्र पर दो भागों में (18.207 हेडेक्टर एवं 859,717 हेडेक्टर) देखारा-बैलाबिला शासन के आवेदन दिनांक 29.06.2002 तक 30 वर्ष की अवधि के लिए खातक ग्राहक नौकरी उद्देश्य की गई। जिसके अनुसार निर्देशन दिनांक 17.10.2005 को दिया गया।

4/ NMDC द्वारा किरिमुज्जिल-11 की सम्पूर्ण रकम 874,924 हेडेक्टर पर विशेष नौकरी करने हेतु दिनांक 09.09.2016 वाले आवेदन प्रतिवेदन दिया गया है, जिसका विवरण अनुसार दस्तावेज़ है।

| विशेष/लंबाई | बुधवार/शनिवार | जिला देखारा | क्रमांक (रकम) | क्रमांक (रकम) (हेडेक्टर) | प्रतिवेदन क्षेत्र | प्रतिवेदन क्षेत्र | प्रतिवेदन क्षेत्र | प्रतिवेदन क्षेत्र | प्रतिवेदन क्षेत्र | प्रतिवेदन क्षेत्र |
|------------|----------------|-------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 638        | 639             | 640         | 641            | 642            | 643            | 644            | 645            | 646            | 647            | 648            | 649            |
| 650        | 651             | 652         | 653            | 654            | 655            | 656            | 657            | 658            | 659            | 660            | 661            |
| 1056       | 1064           | 1074        | 1083          | 1092           | 1101          | 1110          | 1120          | 1130          | 1140          | 1150          | 1160          |
| 874,924    | 874,924        | 874,924     | 874,924       | 874,924       | 874,924       | 874,924       | 874,924       | 874,924       | 874,924       | 874,924       | 874,924       |
| A12        | A13            | A14         | A15            | A16            | A17           | A18           | A19           | A20           | A21           | A22           | A23           |
| 874,924    | 874,924        | 874,924     | 874,924       | 874,924       | 874,924       | 874,924       | 874,924       | 874,924       | 874,924       | 874,924       | 874,924       |
5/ NMDC को प्रमाणीकृत खनिजपट्टा दिनांक 11.09.1987 से संबंधित है एवं प्रथम नगरीकृत सहित भन्ने 2015 के विवरण के 3(3) परिवर्तन में रोग अवधि 20 वर्ष के लिए यथा 11.09.2017 से 10.09.2037 तक (सुलन के प्रताप सिंधिया दिनांक 10.10.2017) हां संलग्न किया गया है।

6/ संलग्न है NMID&K Act 1957 के अंतर्गत ऑपरेशन खंड का अनुमोदन खनिजपट्टा के लिए नियम विधियों द्वारा दिनांक 11.12.2017 हां संलग्न किया गया है जिसके साथ ने अंतर्गत संलग्न हां।

7/ खनिज (सरकारी खंड द्वारा) नियम, 2015 के विवरण 3 के प्रामाण्य नियम मुद्रालार है।

3. 12 जनवरी, 2015 से पूर्व सरकारी कम्पनियों या निम्नों को प्रदत्त किसी खनन पद्धति की अवधि:

(1) खनन खनन अथवा खनन (विकास और विद्युत) सरकार अनुसार, 2015 तथा (2015 का 10) के प्रावधान के लिए सब खनन पद्धति पद्धति की अवधि के लिए किया गया है।

(2) नेतृत्व सरकारी कम्पनियों या निम्नों का खनन पद्धति के सम्बन्ध में कार्य करा जाएगा पुनः ऐसा निर्धारित हो सकता है जिसके लिए दो प्रावधान पर, कार्यक्रम को लेकर करते हुए, खनन पद्धति की अवधि को बिल्कुल अलग कर और अलग किया जा सकता है।

(3) जिनके अनुसार, दोनों कम्पनियों या निम्नों का खनन पद्धति के नियमों के लिए किया गया है जो अन्य अवधि की अवधि के लिए किया गया है, खनन पद्धति की अवधि की अवधि के लिए दो प्रावधान पर, कार्यक्रम को लेकर करते हुए, खनन पद्धति की अवधि को बिल्कुल अलग कर और अलग किया जा सकता है।

6/ मेल ए.एस.एस.ग. विले प्रामाणिक खनिजपट्टा दिनांक 11.09.1987 से संबंधित है एवं प्रथम नगरीकृत सहित खनिज पद्धति के लिए 50 वर्ष दिनांक 10.09.2017 को यथा हो रही है।

9/ अतः अपने विवरण के अनुसार, लागू होने वाले अथवा 11.09.2017 के विवरण के अनुसार, लागू होने वाले 67.924 हेक्टेयर खनन पद्धति की नियम पर, खनन जोड़ी (सरकारी कम्पनी द्वारा) दिनांक 11.09.2017 से दिनांक 10.09.2037 तक (कुल 20 वर्ष) के लिए अधिक तथा तदन्तुलसरी खनिजपट्टा के नियम निर्धारित किया गया है।

10/ खनिजपट्टा दिनांक 29.06.2002 से उल्लेखित अन्य शासन आदेश लागू नहीं हैं।

सलाम—नवादा।

छत्रपति शिवाजी के नाम से

गर्भस्थाप्तक के नाम से

स्वीकृति/—

(सत्यनारायण)

tकार्री/—

(विषूत्र नरेश)

अद्यतन

मोहनेश्वर जनस्वाति

खनिज खंड स्वाक्षर

नया रायपुर दिनांक 3 MAY 2018

प्रतिवेदन एक 4-56/2017/XII.

प्रतिवेदनः—

1. संगठन, भारत सरकार, खनन मंत्रालय, स्वाक्षर, नया रायपुर, नई दिल्ली।
2. संगठन, भारत सरकार, खनन मंत्रालय, नया रायपुर, नई दिल्ली।
3. संगठन, भारत सरकार, खनन मंत्रालय, नया रायपुर, नई दिल्ली।
अतिरिक्त प्रमुख मुख्य द्वारा संस्करण (भू-प्रबंध), गोडल अधिकारी द्वारा संस्करण अधिनियम, 1980 छत्तीसगढ़ 
अध्यक्ष भावन, जेल चेयर, जयपुर,
कलेक्टर, जिला-दक्षिण क्षेत्र दीनदयाल छत्तीसगढ़,
अध्यक्ष सह प्रबंध निदेशक, एन.एम.डी.सी. लिमिटेड, खनिज नम्बर 10-3-311/ए. कैस्टल हिल्स मासाब 
टॅक्स, हैदराबाद 
की और उपयुक्तानुसार सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रस्तुत।

गाइट काईल।

अवर संशोधन [51] छ्याम
छत्तीसगढ़ शासन
खनिज साधन नियंत्रण
No. 31-1015/83/2011-IA-II (M)  
Government of India  
Ministry of Environment & Forests  

Paryavaran Bhawan,  
C.G.O. Complex, Lodi Road,  
New Delhi-110 003.  

Dated the 31st October, 2011

BY SPEED POST

M/s National Mineral Development Corporation Limited  
"Khanjri Bhawan", 10-3-311/A, Castle Hills  
Masab Tank, Hyderabad- 500 173  
E-mail: hois@nmdc.co.in; fax: 040-2353 8711

Subject: Expansion of Bailadilla Iron Ore Deposit No. 11-A (ML area: 232.509 ha;  
cap Exp.: from 5.0 million TPA to 7.0 million TPA) of M/s National Mineral  
Development Corporation Ltd (NMDC), Bacheli, Dantewada District,  
Chhattisgarh - Environmental clearance regarding.

Sir,

This has reference to your letter No.NMDC/EHEV/EC/BLD-11A/2010 dt.  
22.03.2011 on the subject mentioned above. Subsequent information  
furnished during the meeting was also considered.

2. The proposal is for enhancement of production of iron ore from 1.7 million TPA to  
2.8 million TPA from Bailadilla Iron ore Deposit no. 11 A at Bacheli, Dantewada District,  
Chhattisgarh. The mine lease area is 232.509 ha, which is a forestland. Forestry  
clearance has been obtained combined for an area of 674.524 ha for the Bailadilla Iron  
Ore Project. The mining site is located at Latitude: 18° 40' 19" to 19° 41' 33" and  
longitude: 81° 13' 20" to 81° 13' 40". As per the lease area breakup given, area  
under mining will be 32.317 ha, area for waste dump will be 8.75 ha and area for haul  
road will be 6.20 ha. The peak water requirement for the project is estimated as 150  
KLD which will be obtained from surface water (Galt Nallah). The 28.01.2011 order from  
deposit 11-A will be processed along with deposit 10 iron ore in combined processing,  
screening and loading plant. There would be no other facilities and installations at this  
mine area. Mine working will be open cast mechanism involving drilling and blasting.  
Life of mine is 10 years. About 10 lakh trees have been planted under afforestation  
programme at Bacheli Complex. No National Park/s Sanctuary is reported within 10 km  
of the mine lease. Public hearing was held on 28.10.2009. It was reported that there  
is no court case pending against the project. The mine lease is valid till 10.09.2017.  
Existing cost of EPM (capital) is Rs. 0.10 Crores and proposed cost will be Rs. 0.16  
Crones. Recurring cost of EPM is Rs. 0.02 Crores and proposed EPM (Revised) is  
0.10 Crores. Cost of the project will be Rs. 3.4925 Crores.

This is a true copy of original documents which I have signed/attested.

ATTESTED  

[Signature]

(Applied by Lalt. of A.R.)

Hyas Meheram Sabry

ASSOCIATE HONORABLE A.R.

OIL & GASES, PETROLEUM, M.

INDIA NO. 508, 230.
3. The terms of reference for the project were issued on 25.09.2009 for preparation of EIA and EMP. The Public hearing was held on 28.10.2009 at Conference hall at Panchayat Office at Dantewada, Distt. Dantewada by Chhattisgarh Environment Conservation Board. The Mining Plan was approved by I&B on 15.10.2009. Mine lease was renewed on 29.06.2002 vide letter no. F-3-124/96/12/2 by the Deptt. of Mines Resources, Govt. of Chhattisgarh upto 09.09.2017 i.e. for 20 years from 10.09.1997.

4. The proposal has been considered by the Expert Appraisal Committee for Mining based on the project documents and has recommended for the grant of environmental clearance for the said expansion project of Balladia deposit no. 11A. Accordingly, the Ministry of Environment and Forests hereby grants environmental clearance to the said project up to 09.09.2017 under the provisions of Environment Impact Assessment Notification, 2006 subject to strict compliance of the terms and conditions as follows:

A. SPECIFIC CONDITIONS:

(i) The project proponent shall obtain Consent to Establish and Consent to Operate from the Chhattisgarh Environment Conservation Board and effectively implement all the conditions stipulated therein.

(ii) Mineral working will be restricted to only that area of the mine lease for which forest clearance has been obtained. No work shall be undertaken in any forest area without obtaining requisite forest clearance.

(iii) Appropriate safeguard measures shall be taken for control of PM10 levels. The levels shall be regularly monitored to ensure that these are within permissible limit. The records of the monitored data shall be maintained and submitted as part of the six monthly monitoring report to the Regional Office of the Ministry at Bhopal.

(iv) The top soil shall temporarily be stored at convenient place(s) only and it should not be kept utilised for long. The top soil shall be used for land reclamation and plantation.

(v) Transport of mineral from mine to the crushing plant shall be through covered conveyer belt and from there by Railway only.

(vi) The mining operations shall be restricted to above ground water table and it should not intersect the groundwater table. In case, sinking below the ground water table, prior approval of the Ministry of Environment and Forests and the Central Ground Water Authority, shall be obtained. For which a detailed hydro-geological study shall be carried out.
(vii) Trenches / guradian drains shall be constructed at foot of dumps and coke filters installed at regular intervals to arrest silt from being carried to water bodies. Adequate number of Check Dams and Gully Plugs shall be constructed across seasonal/perennial nullahs (if any) flowing through the ML area and silt arrested. De-silting at regular intervals shall be carried out. Adequate mitigating measures shall be taken to improve the water quality of the Gali Kole for making suitable for potable water for the nearby population.

(viii) The optimum charge for blasting shall be determined based on peak particle velocity. Blasting operation shall be carried out only during the day time. Controlled blasting shall be practiced. The mitigative measures for control of ground vibrations and to arrest fly rocks and boulders should be implemented.

(ix) Drills shall either be operated with dust extractors or equipped with water injection system.

(xi) Mineral handling area shall be provided with adequate number of high efficiency dust extraction system, loading and unloading areas including all the transfer points should also have efficient dust control arrangements. These should be properly maintained and operated.

(xii) ETP shall also be provided for the workshop and wastewater generated during the mining operation.

(xiii) Fugitive dust generation shall be controlled. Fugitive dust emission shall be regularly monitored at locations of nearest human habitation (including schools, temples and other public amenities located nearest to sources of dust generation as applicable) and records submitted to the Regional Office of the Ministry at Bhopal.

(xiv) The project authority shall implement suitable conservation measures, including suitable rain water harvesting measures to augment ground water resources in the area in consultation with the Regional Ministry of Central Ground Water Board.

(xv) Regular monitoring of ground water level and quality monitoring. Arsenic shall be carried out in and around the mine lease by establishing a network of existing wells and constructing new piezometers. The periodic monitoring [(at least four times in a year)].
monsoon (April-May), monsoon (August), post-monsoon (November) and winter (January); once in each season) shall be carried out in consultation with the State Ground Water Board/Central Ground Water Authority and the data thus collected may be sent regularly to the Ministry of Environment and Forests and its Regional Office, Bhopal, the Central Ground Water Authority and the Regional Director, Central Ground Water Board. If at any stage, it is observed that the groundwater table is getting depleted due to the mining activity, necessary corrective measures shall be carried out.

(xv) Land-use pattern of the nearby villages shall be studied, including common property resources available for conversion into productive land. Action plan for abatement and compensation for damage to agricultural crops / common property land (if any) in the nearby villages, due to mining activity shall be submitted to the Ministry as well as Regional office at Bhopal within six months.

(xvi) Need based assessment for the nearby villages shall be conducted to study economic measures with action plan which can help in upliftment of poor section of society. Income generating projects consistent with the traditional skills of the people besides development of fodder farm, fruit bearing orchards, vocational training etc. can form a part of such programme. Company shall provide separate budget for community development activities and income generating programmes. This will be in addition to vocational training for individuals impatied to take up self employment and jobs.

(xvil) Occupational Health Cell shall be created at the company under the charge of an officer of adequate seniority who is a qualified person in occupational health. Occupational health and safety measures for the workers including identification of work related health hazards, training on malaria eradication, HIV and health effects on exposure to mineral dust etc. shall be carried out. The company shall engage a full time qualified doctor who is trained in occupational health. Periodic monitoring for exposure to respirable mineral dust on the workers shall be conducted and records maintained including health records of the workers. Awareness programme for workers on impact of mining on their health and precautionary measures like use of personal equipments etc. shall be carried out periodically. Review of impact of various health measures undertaken (at intervals of five years of less) shall be conducted followed by follow up action wherever required.
(viii) The company shall stress upon the preventive aspects of occupational health. Pre-placement medical examination and periodical medical examination of the workers engaged in the project shall be carried out and records maintained. For the purpose, schedule of health examination of the workers should be drawn and followed accordingly.

(ix) The greenbelt plantation all around the mine lease should be completed within first 5 years of grant of environmental clearance. Green belt development and selection of plant species shall be of native species. The density of the trees should be around 2000 plants per ha. Herbs and shrubs shall also form a part of afforestation programme besides tree plantation. Details of year wise afforestation programme including rehabilitation of mined out area shall be submitted to the Ministry as well as Regional Office at Bhopal within six months.

(x) Vehicular emissions shall be kept under control and regularly monitored. Measures shall be taken for maintenance of vehicles used in mining operations and in transportation of mineral within the lease up to the stockyard. The mineral transportation within the lease shall be carried out through the covered trucks only and the vehicles carrying the mineral shall not be overloaded.

(xi) Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.

(xii) The critical parameters such as RSPM (Particulate Matter with a size less than 10micron i.e., PM10) and NOx in the ambient air within the impact zone, peak particle velocity at 300m distance or within the nearest habitation, whichever is closer shall be monitored periodically. Further, quality of discharged water shall also be monitored [TDS, DO, BOD and Total Suspended Solids (TSS)]. The monitored data shall be displayed on the website of the company as well as displayed on a display board at the project site at a suitable location near the main gate of the Company in public domain. The Circular No. I-20012/1/2006-IA.10 (M) dated 27.05.2009 issued by Ministry of Environment and Forests, which is available on the website of the Ministry www.envfor.nic.in shall also be implemented in this regard for its compliance.
The Company shall submit within 3 months their policy towards Corporate Environment Responsibility which should inter alia address (i) Standard operating process/ procedure to bring into focus any infringement/ deviation/ violation of environmental or forest norms/ conditions, (ii) Hierarchical system or Administrative order of the company to deal with environmental issues and ensuring compliance of EC conditions and (iii) System of reporting of non compliance/violation of environmental norms to the Board of Directors of the company and/or stakeholders or shareholders.

A Final Mine Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.

B. **GENERAL CONDITIONS:**

(i) No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forests.

(ii) No change in the calendar plan including excavation, quantum of mineral ore and waste should be made.

(iii) At least four ambient air quality monitoring stations should be established in the core zone as well as in the buffer zone for RSPM (Particulate matter with size less than 10micron i.e., PM\textsubscript{10}) and NO\textsubscript{x} monitoring. Location of the monitoring stations and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board and should be based on the meteorological data, topographical features and environmentally and ecologically sensitive targets.

(iv) Data on ambient air quality (RSPM, Particulate matter with size less than 10micron i.e., PM\textsubscript{10}) and NO\textsubscript{x} should be regularly submitted to the Ministry including its Regional office located at Bhopal and the State Pollution Control Board / Central Pollution Control Board once in six months.

(v) Fugitive dust emissions from all the sources should be controlled, regulated. Water spraying arrangement on haul roads, loading and unloading and transfer points should be provided and properly maintained.

(vi) Measures should be taken for control of noise levels both at day and night in the work environment. Workers engaged in operations of HEMM should be provided with ear plugs / muffs.

(vii) Industrial waste water (workshop and waste water from other sources) should be properly collected, treated so as to conform to the standards prescribed under GSR 422 (F) dated 19\textsuperscript{th} May, 1993 and 31\textsuperscript{st} December, 1993 or as amended from time to time. Oil and grease traps should be installed before discharge of workshop effluents.
(viii) Personnel working in dusty areas should wear protective respiratory devices and they should also be provided with adequate training and information on safety and health aspects. Occupational health surveillance program of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed.

(ix) A separate environmental management cell with suitable qualified personnel should be set up under the control of a Senior Executive, who will report directly to the Head of the Organization.

(x) The funds earmarked for environmental protection measures should be kept in a separate account and should not be diverted for other purposes. Year wise expenditure should be reported to the Ministry and its Regional Office located at Bhopal.

(xi) The project authorities should inform to the Regional Office located at Bhopal regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.

(xii) The Regional Office of the Ministry located at Bhopal shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information / monitoring reports.

(xiii) The project proponent shall submit six monthly reports on the status of compliance of the stipulated environmental clearance conditions including results of monitored data (both in hard copies as well as by e-mail) to the Ministry of Environment and Forests, its Regional Office Bhopal, the respective Zonal Office of Central Pollution Control Board and the State Pollution Control Board. The proponent shall upload the status of compliance of the environmental clearance conditions on its website. The results of monitored data on their website shall be updated in real-time. It shall be updated simultaneously be sent to the Regional Office of the Ministry of Environment and Forests, Bhopal, the respective Zonal Officer of Central Pollution Control Board and the State Pollution Control Board.

(xiv) A copy of the clearance letter shall be sent by the proponent to concerned Gram Panchayat, Zila Parishad / Municipal Corporation, Urban Local Body and the Local NGO, if any, with suggestions/ representation, if any, were received while processing the proposal. The clearance letter shall also be published on the website of the Company by the proponents. The clearance letter shall also be displayed at the Regional Office, District Industry Centre and the Collector's office/ Tehsildar's Office for 30 days.

(xv) The project authorities should advertise at least in two local newspapers.
widely circulated, one of which shall be in the vernacular language of the locality concerned, within 7 days of the issue of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and also at website of the Ministry of Environment and Forests at http://envfor.nic.in and a copy of the same should be forwarded to the Regional Office of this Ministry located at Bhopal.

5. The Ministry or any other competent authority may alter/modify the above conditions or stipulate any further condition in the interest of environment protection.

6. The Ministry may cancel the environmental clearance granted to this project under the provisions of EIA Notification, 2006, if, at any stage of the validity of this environmental clearance, it is found/come to the knowledge of this Ministry that the project proponent has deliberately concealed and/or submitted false or misleading information or inadequate data for obtaining the environmental clearance.

7. Failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and action under the provisions of the Environment (Protection) Act, 1986.

8. The above conditions will be enforced inter-alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and rules made there under and also any other orders passed by the Hon’ble Supreme Court of India/ High Court of Calcutta and any other Court of Law relating to the subject matter.

9. The environmental statement for each financial year ending 31st March in Form-V as is amended to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the concerned Board with the status of compliance of environmental clearance conditions and shall also be sent to the respective Regional Office of the Ministry of Environment and Forests, Bhopal.

10. Any appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

Copy To:


Department:
Shashi Bhardwaj, New Delhi.
2. Secretary, Department of Environment, Government of Chhattisgarh, Raipur.
3. Secretary, Department of Mines and Geology, Government of Chhattisgarh, Raipur.
4. Secretary, Department of Forests, Government of Chhattisgarh, Raipur.
6. Chairman, Central Pollution Control Board, Parivesh Bhawan, CRD-Cum-Office Complex, East Anur Nagar, New Delhi-110 022.
8. Member Secretary, Central Ground Water Authority, A2, W-3 Curzon Road Barracks, K.G. Marg, New Delhi-110001.
10. District Collector, Dantewada, Govt. of Chhattisgarh.

(OM PRAKASH)
DEPUTY DIRECTOR

[Signature]

[Stamp]
To,
M/s National Minerals Development Corporation Limited,
'Khanji', 10-3-311/A,
Castle Hills,
Masab Tank,
Hyderabad-500 028

Subject: Bailadila Iron Ore (Deposit 11-B) Mining Project of M/s National Minerals Development Corporation Limited located in Village Kirandul, Tehsil Kirandul, District South Bastar Dantewada, Chhattisgarh - environmental clearance reg.

Sir,

This has reference to the Ministry of Steel, Government of India letter No. 4(3)2005-RMI dated 01.12.2005 and your letter No. Env/DMP/PANNA/1.17/2005 dated 19.12.2005 and subsequent letters dated 23.01.2006, 08.05.2006, 22.05.2006 and 04.07.2006 on the subject mentioned above. The Ministry of Environment and Forests has considered the application. It has been noted that the project was earlier accorded environmental clearance by the Ministry on 25.10.1993 as an Integrated proposal for iron ore deposit no. 10, 11-A and 11-B. Since the work on the project did not start within 5 years of grant of environmental clearance, the validity of environmental clearance lapsed. The total mine lease area of the project is 874.924 ha, out of which 535.005 ha belongs to deposit 11-B which is a forestland falling in Bailadila Reserve Forest. Area proposed for mining is 36.33 ha, an area of 20.33 ha is kept for CB dumps, 29.96 ha for roads, 30.57 ha for statutory buildings and 417.83 ha is unbroken area. No ecologically sensitive area such as national park/sanctuary/biosphere reserve etc. is located in the core and buffer zone. There is no population in the core zone, therefore, displacement of population and R&R is not involved. Working will be open cast by mechanized method involving blasting. Targeted production capacity of mine is 70 lakh tonnes per annum (7.0 million tonnes per annum) of iron ore. Life of mine is 17 years. Approximately 26119 TPD of mineral, will be transported through covered conveyor from crusher to the screening plant located at a distance of 3.5 km. Ultimate working depth of mine will be 1020 m AMSL. Water table is at 740 m AMSL. Mining will not intersect ground water table. Peak water requirement of the project is 1150m³/day, which will be met from Mahaner Nadi. Approximately 3.17 million m² of solid waste generated during the entire life of the mine, out of which 1.79 million m² will be stored in waste dump no 1 and 0.54 million m² is waste dump no. 2, remaining 0.84 million m² of solid waste will be backfilled from the 11th year onwards. There will be two CB dumps with a maximum height of 64 m. The entire area of 535.003 ha will be covered under plantation at the end of the mine life. NOC issued by the Chhattisgarh Environment Conservation Board on 18.11.2005 for production of 7.0 million TPA of iron ore (ROM) for deposit 11-B. Public hearing of the project held on 12.04.2005. The Indian Bureau of Mines has approved mining plan for deposit no. 11 on 23.07.1997 for lease area of 1809.23 ha and subsequently approved modified mining plan for an area of 874.924 ha on ...2/-

2. The Ministry of Environment & Forests hereby accords environmental clearance to the above mentioned Balladla Iron Ore (Deposit 11-B) Mining Project of M/s National Mineral Development Corporation Limited for annual production capacity of 70.0 lakh tonnes (7.0 million tonnes per annum) of iron ore by opencast mechanized method involving total area of 535.003 ha under the provisions of the EIA Notification 1994 and its subsequent amendments issued under Environment (Protection) Act, 1986 subject to implementation of the following conditions and environmental safeguards.

A. Specific conditions

(i) The environmental clearance is granted to 11-B deposit only having lease area of 535.003 ha.

(ii) All the conditions stipulated by the State Pollution Control Board in their consent to establish should be effectively implemented.

(iii) The mining operations shall not intersect groundwater table. The mine working will be restricted to above water table. Prior approval of the Ministry of Environment & Forests and Central Ground Water Authority shall be obtained for mining below water table.

(iv) Topsoil, if any, shall be stacked properly with proper slope with adequate measures and should be used for reclamation and rehabilitation of mined out areas.

(v) Over Burden should be stacked at earmarked dump site(s) only and should not be kept active for long period. The total height of the dumps shall not exceed 64 m, having four benches. Overall slope of the dump shall not exceed 26°. The OB dumps should be scientifically vegetated with suitable native species to prevent erosion and surface run off. In critical areas use of geo textiles shall be undertaken for stabilization of the dumps. Monitoring and management of rehabilitated areas should continue until vegetation becomes self-sustaining. Compliance status should be submitted to the Ministry of Environment & Forests on six monthly basis.

(vi) Catch drains and siltation ponds of appropriate size should be constructed to arrest silt and sediment flows from mine working, soil, OB and mineral dumps. The water so collected should be utilized for watering the mine area, roads, green belt development etc. The drains should be regularly desilted particularly after monsoon and maintained properly.

Garland drain (size, gradient and length) shall be constructed for both mine pit and for waste dumps and sump capacity should be designed keeping 50% safety margin over and above peak sudden rainfall (based on 50 years data) and maximum discharge in the area adjoining the mine site. Sump capacity should also provide adequate retention period to allow proper settling of silt material. Sedimentation pits should be constructed at the corners of the garland drains and desilted at regular intervals.
(vii) Dimension of the retaining wall at the toe of dumps and OB benches within the mine to check run-off and siltation should be based on the rain fall data.

(viii) Plantation shall be raised in entire area of 535.003 ha including a green belt of adequate width by planting the native species around ML area, OB dump sites, roads etc. in consultation with the local DFO / Agriculture Department. The density of the trees should be around 2500 plants per ha.

(ix) The slime dumped already on land should be cleared within 5 years and thereafter there shall be no external dump of slime.

(x) Diversion of Madadi Nallah will be carried out within 5 years.

(xi) Regular monitoring of water quality downstream of check dam after the tailing pond should be carried out particularly in locations close to habitation along the nallah. The record of monitoring data should be maintained and submitted to MoEF, its Regional Office, SPCB and CPCB. The monitoring of water quality downstream may start immediately.

(xii) The project authority should implement suitable conservation measures to augment ground water resources in the area in consultation with the Regional Director, Central Ground Water Board.

(xiii) Regular monitoring of ground water level and quality should be carried out by establishing a network of existing wells and constructing new piezometers during the mining operation. The monitoring should be carried out four times in a year - pre-monsoon (April-May), monsoon (August), post-monsoon (November), and winter (January) and the data thus collected may be sent regularly to MOEF, Central Ground Water Authority and Regional Director Central Ground water Board.

(xiv) Permission from the competent authority should be obtained for drawal of surface water and ground water if any, required for the project.

(xv) Suitable rainwater harvesting measures on long term basis shall be planned and implemented in consultation with Regional Director, CGWB.

(xvi) Vehicular emissions should be kept under control and regularly monitored. Measures shall be taken for maintenance of vehicles used in mining operations and in transportation of mineral. The vehicles should be covered with a tarpaulin and shall not be overloaded.

(xvii) Blasting operation should be carried out only during the daytime. Controlled blasting should be practiced. The mitigative measures for control of ground vibrations and to arrest fly rocks and boulders should be implemented.

(xviii) Drills should be wet operated or operated with dust extractors.

(xix) The project proponent should take all precautionary measures during mining operation for conservation and protection of endangered fauna such as leopard,
peacock etc. spotted in the study area. Action plan for conservation of flora and fauna shall be prepared and its implementation shall start by 2007 in consultation with the State Forest and Wildlife Department. Necessary allocation of funds for implementation of the conservation plan shall be made and the funds so allocated shall be included in the project cost. Copy of action plan may be submitted to the Ministry and its Regional Office within 3 months.

(xx) Consent to operate should be obtained from SPCB before starting production from the mine.

(xxii) Sewage treatment plant should be installed for the colony. ETP should also be provided for workshop and mineral separation plant wastewater.

(xxii) A Final Mine Closure Plan along with details of Corpus Fund should be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.

B. General conditions

(i) No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forests.

(ii) No change in the calendar plan including excavation, quantum of mineral iron ore and waste should be made.

(iii) Four ambient air quality-monitoring stations should be established in the core zone as well as in the buffer zone for RPM, SPM, SO\textsubscript{2} and NO\textsubscript{x} monitoring. Location of the stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board.

(iv) Data on ambient air quality (RPM, SPM, SO\textsubscript{2} and NO\textsubscript{x}) should be regularly submitted to the Ministry including its Regional office located at Bhopal and the State Pollution Control Board / Central Pollution Control Board once in six months.

(v) Fugitive dust emissions from all the sources should be controlled regularly. Water spraying arrangement on haul roads, loading and unloading and at transfer points should be provided and properly maintained.

(vi) Measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in operations of HEMM, etc. should be provided with ear plugs / muffs.

(vii) Industrial waste water (workshop and waste water from the mine) should be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May, 1993 and 31st December, 1993 or as amended from time to time. Oil and grease trap should be installed before discharge of workshop effluents.
(viii) Personnel working in dusty areas should wear protective respiratory devices and they should also be provided with adequate training and information on safety and health aspects.

Occupational health surveillance program of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed.

(ix) Separate environmental management cell with suitable qualified personnel should be set-up under the control of a Senior Executive, who will report directly to the Head of the Organization.

(x) The project authorities should inform to the Regional Office located at Bhopal regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.

(xi) The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year wise expenditure should be reported to the Ministry and its Regional Office located at Bhopal.

(xii) The Regional Office of this Ministry located at Bhopal shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information / monitoring reports.

(xiii) A copy of clearance letter will be marked to concerned Panchayat / local NGO, if any, from whom suggestion / representation has been received while processing the proposal.

(xiv) State Pollution Control Board should display a copy of the clearance letter at the Regional office, District Industry Centre and Collector’s office/ Tehsildar’s Office for 30 days.

(xv) The project authorities should advertise at least in two local newspapers widely circulated, one of which shall be in the vernacular language of the locality concerned, within 7 days of the issue of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and also at web site of the Ministry of Environment and Forests at http://envfor.nic.in and a copy of the same should be forwarded to the Regional Office of this Ministry located at Bhopal.

3. The Ministry or any other competent authority may alter/modify the above conditions or stipulate any further condition in the interest of environment protection.

4. Failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.
5. The above conditions will be enforced inter-alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and rules.

(SATISH C. GARKOTI)
Additional Director (S)

Copy to:

1. Secretary, Ministry of Steel, Government of India, Udyog Bhawan, New Delhi.

2. Secretary, Ministry of Mines, Government of India, Shastri Bhawan, New Delhi.

3. Secretary, Department of Environment, Government of Chhattisgarh, Secretariat Raipur.

4. Secretary, Industries and Mines Department, Government of Chhattisgarh, Secretariat Raipur.


6. Chairman, Central Pollution Control Board, CBD-Cum-Office Complex, East Arjun Nagar, New Delhi-110 032.

7. Chairman, Chhattisgarh State Environment Conservation Board, 14/3, Park Street, Chaubay Colony, Raipur, Chhattisgarh - 492001.

8. Member Secretary, Central Ground Water Authority, A2, W3 Curzon Road Barracks, K.G. Marg, New Delhi-110001.


10. District Collector, South Bastar Dantewada District, Chhattisgarh.

11. EI Division, Ministry of Environment & Forests, EI Division, New Delhi.


To

M/s. National Mineral Development Corporation Ltd.
Khanij Bhawan 10-3-311/A,
Castle Hills, Masab Tank,
Hyderabad – 500 028

Sub: Expansion project of Bailadila Iron Ore mine (ML area 935.522 ha)
Deposit No. 14/11C at Bailadila Range Hills at village Kiranduli, South Bastar, Dantewada Distt., Chhattisgarh – reg. environmental clearance.

Sir,

The undersigned is directed to refer to the office memorandum received from the Ministry of Steel vide letter no. F.No.5 (5)2007-RMI, dated 29.05.2007 on the above mentioned subject. The Ministry of Environment and Forests has examined the application.

2. It is noted that the proposal is for expansion of open cast mechanized iron ore mining at Deposit-14 from 3.2 MTPA to 5.0 MTPA and Deposit-11C from 5.0 MTPA to 7.0 MTPA. The following has been noted from the information provided by you. The mines are located at Bailadila range hills at village Kiranduli, South Bastar, Dantewada District, in Chhattisgarh. The mineral reserve of Deposit-14 is 150.94 MT and life of the Deposit 14 will be 30 years at the proposed rate of production. The mineral reserve of Deposit-11C is 72.56 MT and the life of this deposit at proposed production will be 15 years. Mining is proposed to be carried out from hill top in both the deposits. There will be no ground water intersection due to mining activity. Water requirement for the expansion will be about 8540 Kld which will be met from existing Nallahs in Malinger, Bacheli and Kiranduli. The mines spread over an area of 935.522 ha which falls in Bailadila reserved forests. Forestry clearance has been obtained on 18.06.1999 and 22.12.1999 respectively. No displacement of household is involved due to proposed expansion. No national park/wildlife sanctuary/biosphere reserve etc. is located within 10 km radius of the ML area. No ground water extraction is involved. The total quantity of solid waste to be generated is 54334 m³. Green belt development is being undertaken through Chhattisgarh Raj Van Vikas Nigam Ltd. since 2003. It is proposed to plant 50,000 trees every year out side the ML area also. It is also noted that Public hearing of the project was held on 13.05.2006. IBM has approved Mining scheme and progressive mine closure plan on 01.04.2006 & 12.03.2007 respectively. Cost of the project is Rs.350.00 crores.

3. The project has been considered in accordance with the provisions of the EIA notification issued by the Ministry of Environment & Forests vide S.O. 1533 (E), dated September 14, 2006 and its interim operational guidelines issued on October 13, 2006.

4. Based on the information submitted by you, the Ministry of Environment and Forests hereby accords environmental clearance to the above project under the provisions of EIA Notification dated September 14, 2006, subject to the compliance of the following Specific and General conditions:

Cont'd...
A. Specific conditions

(i) Appropriate management of slime shall be undertaken to prevent pollution of surface water bodies. As per action plan submitted to the Ministry of Environment & Forests for utilization of slime including additional slime to be generated due to proposed expansion, the slime shall be utilised for pellets manufacturing after beneficiation.

(ii) Detailed report on de-silting of tailing dams and management of silt shall be submitted to the Ministry of Environment & Forests at regular interval.

(iii) Assessment of erosion potential and sedimentation control plan shall be carried out and submitted to the Ministry.

(iv) Conceptual mining plan for every five year for the life of the mine shall be submitted to the Ministry for record. Water bodies shall be developed and utilized to develop pisciculture by organizing fishermen cooperative society with the land losers and the poorer section (specially tribals) of area opted as members of such society. Financial assistance in the form of share money and managerial assistance shall be made available so that the members themselves can run the affairs of the society in due course. The project proponent shall arrange marketing tie up so that the society gets fair price of their produce and the profits are equitably shared by the members of the society as regular source of income.

(v) Top soil/solid waste shall be stacked properly with proper slope with adequate safeguards and shall be backfilled (wherever applicable) for reclamation and rehabilitation of mined out area.

(vi) Over burden (OB) shall be stacked at earmarked dump site(s) only and shall not be kept active for long period. The maximum height of the dump shall not exceed 30 m, each stage shall preferably be of 10 m and overall slope of the dump shall not exceed 28°. The OB dump shall be backfilled. In critical areas, use of geo textiles shall be undertaken for stabilization of the dump. The OB dumps shall be scientifically vegetated with suitable native species to prevent erosion and surface run off. Monitoring and management of rehabilitated areas shall continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment & Forests on six monthly basis.

(vii) Garland drains shall be constructed to arrest silt and sediment flows from soil, and mineral dumps. The water so collected shall be utilized for watering the mine area, roads, green belt development etc. The drains shall be regularly desilted particularly after monsoon and maintained properly.

Garland drain of appropriate size, gradient and length shall be constructed for both mine pit and for waste dump and sump capacity shall be designed keeping 50% safety margin over and above peak sudden rainfall (based on 50 years data) and maximum discharge in the area adjoining the mine site. Sump capacity shall also provide adequate retention period to allow proper settling of silt material. Sedimentation pits shall be constructed at the corners of the garland drains and desilted at regular intervals.

(viii) Slope of the mining bench and ultimate pit limit shall be as per the mining scheme approved by Indian Bureau of Mines.

(ix) Drilling and blasting (if any) shall be conducted by using dust extractors/wet drilling.
Green belt development shall be carried out considering CPCB guidelines including selection of plant species and in consultation with the local DFO / Agriculture Department. Herbs and shrubs shall also form a part of afforestation programme besides tree plantation. Plantation shall be raised in 308.73 ha in the ML area, haul roads, OB dump sites etc. The density of the trees shall be around 2500 plants per ha. The company shall involve local people with the help of self help group for plantation programme.

The project authority shall implement suitable conservation measures to augment ground water resources in the area in consultation with the Regional Director, Central Ground Water Board.

Regular monitoring of ground water level and quality shall be carried out by establishing a network of existing wells and constructing new piezometers during the mining operation. The monitoring shall be carried out four times in a year – pre-monsoon (April-May), monsoon (August), post-monsoon (November) and winter (January) and the data thus collected shall be regularly sent to MoEF, Central Ground Water Authority and Regional Director, Central Ground Water Board.

The waste water from the mine shall be treated to conform to the prescribe standards before discharging into the natural stream. The discharged water from the tailing dam shall be regularly monitored and report submitted to the Ministry of Environment & Forests, Central Pollution Control Board and the Andhra Pradesh Pollution Control Board.

Prior permission from the competent authority shall be obtained for extraction of ground water, if any.

Vehicular emissions shall be kept under control and regularly monitored. Vehicles used for transportation of ores and others shall have valid permissions as prescribed under Central Motor Vehicle Rules, 1989 and its amendments. Measures shall be taken for maintenance of vehicles used in mining operations and in transportation of mineral. The vehicles transporting ores shall be covered with a tarpaulin or other suitable enclosures so that no dust particles / fine matters escape during the course of transportation. No overloading of ores for transportation shall be committed.

A final-mine closure plan, along with details of Corpus Fund, shall be submitted to the Ministry of Environment & Forests, 5 years in advance of final mine closure for approval.

**General conditions**

(i) No change in mining technology and scope of working shall be made without prior approval of the Ministry of Environment & Forests.

(ii) No change in the calendar plan including excavation, quantum of mineral and waste shall be made.

(iii) Conservation measures for protection of flora and fauna in the core & buffer zone shall be drawn up in consultation with the local forest and wildlife department.

(iv) Four ambient air quality-monitoring stations shall be established in the core zone as well as in the buffer zone for RPM, SPM, SO2, NOx monitoring. Location of the stations should be decided based on the meteorological data, topographical features...
and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board.

(v) Data on ambient air quality (RPM, SPM, SO₂, NOₓ) should be regularly submitted to the Ministry including its Regional office located at Bangalore and the State Pollution Control Board / Central Pollution Control Board once in six months.

(vi) Fugitive dust emissions from all the sources shall be controlled regularly. Water spraying arrangement on haul roads, loading and unloading and at transfer points shall be provided and properly maintained.

(vii) Measures shall be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in operations of HEMM, etc. shall be provided with ear plugs / mufffs.

(viii) Industrial waste water (workshop and waste water from the mine) shall be properly collected and treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May, 1993 and 31st December, 1993 or as amended from time to time.

(ix) Personnel working in dusty areas shall be provided with protective respiratory devices and they shall also be imparted adequate training and information on safety and health aspects.

(x) Occupational health surveillance program of the workers shall be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed. Records of health of the workers shall be maintained.

(xi) A separate Environmental Management Cell with suitable qualified personnel shall be set-up under the control of a Senior Executive, who will report directly to the Head of the Organization.

(xii) The project authorities shall inform to the Regional Office of the Ministry located at Bhopal regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.

(xiii) The funds earmarked for environmental protection measures shall be kept in separate account and shall not be diverted for other purpose. Year wise expenditure shall be reported to the Ministry and its Regional Office located at Bhopal.

(xiv) The project authorities shall inform to the Regional Office located at Bhopal regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.

(xv) The Regional Office of the Ministry located at Bhopal shall monitor compliance of the stipulated conditions. The project authorities shall extend full cooperation to the officer(s) of the Regional Office by furnishing the requisite data / information / monitoring reports.

(xvi) A copy of clearance letter will be marked to concerned Panchayat / local NGO, if any, from whom suggestion / representation has been received while processing the proposal.

(xvii) State Pollution Control Board should display a copy of the clearance letter at the Regional office, District Industry Centre and Collector’s office / Tehsildar’s Office for 30 days.

Cont'd...
(xviii) The project authorities shall advertise at least in two local newspapers widely circulated, one of which shall be in the vernacular language of the locality concerned, within 7 days of the issue of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and also at web site of the Ministry of Environment and Forests at http://envfor.nic.in and a copy of the same shall be forwarded to the Regional Office of the Ministry located Bangalore.

5. The Ministry or any other competent authority may alter/modify the above conditions or stipulate any further condition in the interest of environment protection.

6. Concealing factual data or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.

7. The above conditions will be enforced inter-alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and rules.

Yours faithfully,

(W. Bharat Singh)
Deputy Director

Copy to:

1. Secretary, Ministry of Mines, Government of India, Shastri Bhawan, New Delhi.
2. Secretary, Department of Environment, Government of Chhattisgarh, Raipur.
3. Secretary, Department of Mines and Geology, Government of Chhattisgarh, Raipur.
4. Secretary, Department of Forests, Government of Chhattisgarh, Raipur.
7. Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-Cum-Office Complex, East Arjun Nagar, New Delhi-110 032.
9. Member Secretary, Central Ground Water Authority, A2, W-3’ Curzon Road Barracks, K.G. Marg, New Delhi-110001.
11. District Collector, Dantewada, Govt. Chhattisgarh.
15. Record File.

(W. Bharat Singh)
Deputy Director
F.No. 198/97-FC
Government of India
Ministry of Environment & Forests
F.C. Division

Paryavaran Bhawan
CGO Complex, Lodhi Road
New Delhi - 110 001
Dated: 22.12.99

The Secretary (Forests),
Government of Madhya Pradesh,
BHOPAL.

Sub: Renewal of mining lease over 1767.130 hectare of forest land in favour of M/s NMDC Ltd., Bailadila Iron Ore project in Distt. Bastar.

I am directed to refer to your letters No. F-5/34/97/10/3 dt. 29.4.1997 and even No. F-5/34/97/10/3 dt. 3.5.1999 on the above mentioned subject seeking prior approval of the Central Government in accordance with Section 2 of the Forest (Conservation) Act, 1980 and to say that the proposal has been examined by the Advisory Committee constituted by the Central Government under Section 3 of the aforesaid Act.

After careful consideration of the proposal of the State Government and on the basis of recommendation of the above mentioned Advisory Committee, the Central Government hereby conveys its approval under Section 2 of the Forest (Conservation) Act, 1980 for renewal of mining lease over 1767.130 hectare of forest land (180.320 hectare already broken up for 1.31.7 hectare fresh area to be broken up into 662.287 hectare blank area to be afforested in favour of M/s NMDC Ltd., Bailadila Iron Ore project in Distt. Bastar subject to following conditions:

1. Legal status of forest land shall remain unchanged.
2. Compensatory afforestation will be carried out over degraded forest land twice of 662.287 hectare i.e. 1324.574 hectare at a project cost of Rs. 300 crores. Land covered by mining lease shall be kept free from encroachments and encroachments should be removed immediately.
3. Afforestation will be carried out over 662.287 hectare of blank area at the project cost. A detailed afforestation scheme of native tree species in this regard will be prepared by the State Forest Department and submitted to this Ministry within 3 months from the date of receipt of this letter. A committee consisting of CF(Central), Regional Office, BHOPAL shall constitute the nodal office of the State Government and CF(Territorial) shall monitor progress of this condition. The entire area of 662.287 hectare will be fenced at the cost of agency and maintained as green area.

Yours faithfully,

[Signature]

General Manager
NMDC Ltd.
Bailadila Iron Ore Mine
Depot No. 1
P.O. - Kothapeta
Distt. - Bastar

[Signature]

[Official Stamp]
Fencing, protection and regeneration of the safety zone area will be done at the project cost. Besides this, afforestation over one and a half times of safety zone area in degraded forest elsewhere will be done at the project cost. Deposition of mining lease area will be done on the ground at project cost using four feet high reinforced concrete pillars, with serial numbers, forward & back bearings and distance from pillar to pillar.

The user agency will make arrangement for free supply of fuelwood preferably alternate energy source to labourers and staff working on the project site so as to avoid any pressure on the adjacent forest areas.

Declaration of lease areas will be done as per plan in consultation with the State Forest Department at the cost of user agency.

The period of permission for lease under the Forest (Conservation) Act, 1980 will be for 90 years co-terminous with lease under MMRD Act, 1957 w.e.f. the date of expiry of provision lease.

The approval under the Forest (Conservation) Act, 1980 is subject to the clearance under the Environmental Protection Act, 1986, if applicable.

Any other condition that the State Govt. or the Chief Conservator of Forests (Central), General Office, Bangalore may impose from time to time in the interest of afforestation and protection of forests.

This issues in pursuance of the Hon'ble Supreme Court order dated 17.12.1999 in the IA's No. 426 in the matter of WP(C) No. 202/95. As per this order, modalities in respect of afforestation, fencing & protection of safety zone, reclamation plan, etc. are being worked by this Ministry. Therefore, an amount of Rs. 10,80,31,687/- realised from the user agency account of above works in the instant proposal should be kept intact in the and shall not be utilised till further orders.

Yours faithfully,

(R.K. GUPTA)

Assistant Inspector General of Forests

To

The Principal Chief Conservator of Forests, Government of Madhya Pradesh, Bhopal.

No. 6.

Office of the Principal Chief Conservator of Forests, Government of Madhya Pradesh, Bhopal.

To

Regional Office, Regional Office, Bhopal.

The General Manager, Kirandul Iron Ore Project, Kirandul-494 556,

Madhya Pradesh.

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