

**4th MODIFICATION TO THE APPROVED REVIEW &
UPDATION OF**

MINING PLAN

INCLUDING PROGRESSIVE MINE CLOSURE PLAN

Submitted under Rule 17(3) of MCR 2016 & Rule 23 of MCDR 2011 for approval

VEDANTA IRON ORE MINE - (ML NO. 2677)

Of

M/s. VEDANTA LTD



Mine code: 30KAR07013
Rule 45 Reg. no: IBM/327/2011

In Meghalahalli, Bommavvanagathihalli, Madakeripura, Chowdenahally, Tanigehalli,
Hirekandavadi villages, Chitradurga & Holalkere taluks
Chitradurga District, Karnataka State

Area: 160.59 Ha

Land Type: Forest - Niruthadi Reserved Forest

Lease period: 20 years w.e.f 28.10.2012

Category: A (Fully Mechanized), Open Cast, Private, Non-Captive

**Approved Review and Updation of Mining Plan Period:
2017-18 to 2021-22**

**Modified Review and Updation of Mining Plan Period:
2019-20 to 2021-22 (i.e., upto 31.03.2022)**

TEXT & ANNEXURES

Prepared by

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M Sc (Mineral Exploration)
Qualified Person

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Qualified Person

Mar-2020

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भारत सरकार/ GOVERNMENT OF INDIA
खान मंत्रालय/ MINISTRY OF MINES
भारतीय खान ब्यूरो/ INDIAN BUREAU OF MINES
क्षेत्रीय खान नियंत्रक कार्यालय/
OFFICE OF THE REGIONAL CONTROLLER OF MINES



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29, इंडस्ट्रियल सबर्ब II स्टेज, तुमकुर रोड,
गौरगुंटापाल्या बेशवंतपुर,
बेंगलुरु -560022

दिनांक/Date: 12/03/2020

सं/No.: 279/272/91/BNG /430

सेवा में/ To,

M/s. Vedanta Ltd.,

Sesa Ghor, 20 EDC Complex, Patto,

Panjim-Goa,

North Goa-403001.

विषय/Sub: Approval of "Modifications to the Approved Review and Updation of Mining Plan" in respect of **ML No. 2677 of M/s Vedanta Ltd.** over an area of 160.59Ha in Meghalahalli, Bommavvanagathihalli, Madakeripura, Chowdenahally, Tenigehalli, Hirekandavadi villages, Chitradurga & Holalkere Taluk, Chitradurga District, Karnataka state, submitted for approval under rule 17(3) of MCR, 2016.

संदर्भ /Ref: 1. Your letter No. Nil dated 06/03/2020 submitting 02 copies of draft Modifications to the Approved Review and Updation of Mining Plan in respect of aforesaid M.L. area.
2. This office letter of even no. dated 10/03/2020
3. Your letter No. Nil dated. 11/03/2020, submitting final copies of Modifications to the Approved Review and Updation of Mining Plan in respect of aforesaid M.L. Area.

महोदय/Sir,

In exercise of the powers conferred by clause (b) of sub-section (2) of section 5 of the Mines and Minerals (Development & Regulation) Act, 1957 and clause (3) of Rule 17 of the Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016 read with Govt. of India order No.S.O.445 (E) dated 28.04.1987 and S.O.1857 (E)dtd.18/05/2016. I hereby **approve the Modifications to the approved Review and Updation of Mining Plan including Progressive Mine Closure Plan** in respect **ML No. 2677 of M/s Vedanta Ltd.** over an area of 160.59Ha in Meghalahalli, Bommavvanagathihalli, Madakeripura, Chowdenahally, Tenigehalli, Hirekandavadi Villages, Chitradurga & Holalkere Taluk, Chitradurga District, and Karnataka State. This approval is subject to the following conditions:

1. The Modification to the approved Review and Updation of Mining Plan with Progressive Mine Closure Plan is approved without prejudice to any other laws applicable to the mine from time to time whether made by the Central Government, State Government or any other authority and without prejudice to any order or direction from any court of competent jurisdiction.
2. The proposals shown on the plates and /or given in the document is based on the lease map/Sketch submitted by the applicant /lessee and is applicable from the date of approval.
3. It is clarified that the approval of your aforesaid Modification to the approved Review and Updation of Mining Plan with Progressive Mine Closure Plan does not in any way imply the approval of the Government in terms of any other provisions of the Mines and Minerals (Development and Regulation) Act 1957 or the Mineral (Other than Atomic and Hydro-Carbon Energy Minerals) Concession Rules, 2016 and any other laws including Forest (Conservation) Act, 1980, Environment (Protection) Act, 1986 or the rules made there under Mines Act, 1952 and Rules & Regulations made there under.
4. Indian Bureau of Mines has not undertaken verification of the mining lease boundary on the ground and does not undertake any responsibility regarding correctness of the boundaries of the leasehold shown on the ground with reference to lease map& other plans furnished by the applicant/ lessee.

P.T.O.

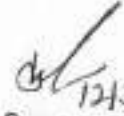
5. At any stage, if it is observed that the information furnished, data incorporated in the document are incorrect or misrepresent facts, the approval of the document shall be revoked with immediate effect.
6. Next Financial Assurance shall be due for submission on 01.04.2022.
7. The execution of Modification to the approved Review and Updation of Mining Plan shall be subjected to vacation of prohibitory orders / notices, if any.
8. The Approval of Modification to the approved Review and Updation of Mining Plan is strictly confined to the proposals contained within the mining leasehold demarcated as per lease sketch given by the joint survey team constituted by the CEC and duly authenticated by the State DMG. It does not convey approval to the proposals falling outside the Mining Lease boundary.
9. The Approval of Modification to the approved Review and Updation of Mining Plan is without prejudice to the final order of the Hon'ble Supreme Court order dtd.18/04/2013 in W.P. No. 562/2009 and interim orders passed by the Hon'ble Supreme Court from time to time in the said W.P. Nos. 25910/2009 and 26083/2009.
10. A copy of Environment Impact Assessment and Environment Management Plan as approved by the MOEF, New Delhi shall be submitted to this office along with a copy of their approval letter, within one month of the date of such approval.
11. The Environmental Monitoring Cell of the company shall continue monitoring ambient air quality, dust fall rate, water quality, soil sample analysis and noise level measurements on various stations established for the purpose both in the core zone and buffer zone as per MOEF guidelines and keeping in view IBM's circular No.3/92, season wise every year or by engaging the services of an Environment Laboratory approved by MOEF/CPCB. The data so generated shall be maintained in a bound paged register kept for the purpose and the same shall be made available to the inspecting officer on demand.
12. In case the mining lease falls within a radius of 10 kms of National Park/ sanctuary, recommendations of NBWL have to be obtained as per the Order of Hon'ble Supreme Court in I A No. 460/2004.
13. An yearly report shall be submitted to this office before 1st July of every year setting forth the extent of protective and rehabilitative works carried out as envisaged in the approved progressive mine closure plan.
14. The Modification to the approved Review and Updation of Mining Plan is approved for proposals contained therein and as applicable from the date of approval of the document for the mining activities to be carried out within the mining lease hold. The earlier instances of irregular mining/illegal mining, if any, shall not be regularized with this approval.
15. The contents of Circular No 2/2010 issued by the Chief Controller of Mines, Indian Bureau of Mines, Nagpur vide his letter No- 11013/3/MP/90-CCOM VOL-VII dated 06.04.2010 shall be complied with.
16. If anything is found to be concealed as required by the Mines Act in the contents of this document and the proposal for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect.
17. You shall maintain the boundary pillars as required under Rule 12 of Minerals (Other than Atomic & Hydro Carbons Energy Minerals) Concession Rules, 2016.
18. As per the Hon'ble Supreme Court of India in Writ Petition No. 114/2014 dated 08.01.2020, the mining Lease holders shall, after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc.
19. The Modification to the approved Review and Updation of Mining Plan is approved for 3 years period from 2019-20 to 2021-2022 for total Mineral Reserves of **101.664** Million Tonnes of Iron ore and **27.142** Million Tonnes of Hematitic Siliceous Iron Ore with Annual Production Capacity proposals valid for the following period with respective production capacity.

Year	Production Capacity in Tonnes		
	Iron Ore	Hematitic Siliceous Ore	Total
2019-20 for the balance period	471,900	Nil	471,900
2020-21	5,482,200	407,430	5,889,630
2021-22	6,489,750	710,235	7,199,985

20. The Lessee shall obtain an Environment Clearance before financial year 2021-22 for production of 7.2 million tonnes per annum of iron ore from the competent authority as committed in modification to the approved Review and Updation of Mining Plan.
21. This approval is subject to the grant of production allocation of 7.2 million tonnes per annum of iron ore from the Central Empowered Committee.
22. The Lessee shall not produce 7.2 million tonnes per annum of iron ore prior to obtaining the necessary permission/approval from the competent authority.

भवदीय/Yours faithfully,

संलग्नक : अनुलग्नक/ One copy of the approved Modification to the
Approved Review and Updation of Mining Plan with Progressive Mine Closure plan.


12/3/20

(जी सी मीणा/ G C Meena)

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

ANNEXURES



Sl. No.	Description	No. of pages
1	Copy of fourth ML renewal deed dated 02.02.2015	18
2	Name change letter to Sesa Goa Ltd dated 03.08.2005	1
3	Name change letter to Sesa Sterlite Ltd dated 31.12.2013	1
4	Certificate of Company Registration dated 21.10.2015	1
5	Change of name letter to IBM dated 28.04.2015	1
6	Change of name letter to DMG/C&I dated 04.06.2015	1
7	Modification of RUMP approval letter dated 19.06.2018	3
8	Letter of CEC permission dated 04.03.2020	2
9	Forest Clearance Copy dated 30.12.2014	4
10	Environmental Clearance copy dated 05.02.2009	7
11	Copy of board resolution dated 28.10.2016	1
12	List of Directors dated 29.04.2015	1
13	Photo ID of Nominated Owner	1
14	Copy of QP certificates	7
15	Copy of Form I submitted IBM on 18.01.2019	1
16	IBM violation letter and reply	7
17	Lithologs of drilled BH	1
18	Reports of Bulk density tests dated 17.03.2016	1
19	Recovery test reports dated 02.03.2016	4
20	IBM report on Siliceous Ore	8
21	Common boundary working arrangement dated 06.10.2015	2
22	Production and Development Program	2
23	Feasibility Study Report	8
24	Flow sheet of existing plants	1
25	Environment monitoring reports	28
26	Copy of Bank Guarantee	4
27	Analysis reports from NABL lab	47



LIST OF PLANS AND SECTIONS

Nos.	DESCRIPTION	SCALE
I a	Location Plan	NTS
I b	Key Plan / Precise area map on Toposheet	1 : 50,000
I c	Lease Sketch	1" = 660'
I d	Vectorised Cadastral DGPS map	1" = 7920'
II a	Surface Plan	1 : 2000
II b	Geological Plan	1 : 2000
II c	Geological Cross Sections (IIc/1,2,3,4&5)	1 : 2000
II d	Typical Slice Plan	1 : 2000
II e	Graphic Lithologs (II/e 1,2 & 3)	1 : 1000
III a - c	Year wise Production & Development plan	1 : 2000
III/d	Year wise Production & Development Sections (1-5)	1 : 2000
IV	Reclamation Plan	1 : 2000
V	Environment Plan	1 : 5000
VI/a	Conceptual Plan & Sections	1 : 2000
VI/b	Conceptual Dump Management Plan	1 : 2000
VI/c	Conceptual Dump Section	1 : 2000
VII	Financial Area Assurance Plan	1 : 2000

**INTRODUCTORY NOTES:**

Vedanta Limited (Formerly known as Sesa Sterlite Ltd. Sesa Goa Ltd.) is having a Mining Lease No. 2677 for mining of Iron Ore in the Forest land near Meghalahalli, Bommavvanagathihalli, Madakeripura, Chowdenahally, Tanigehalli, Hirekandavadivillages, Chitradurga and Holalkere taluks, Chitradurga district. This lease was first granted in 1952 and the last (fourth) renewal of the lease was executed on 02.02.2015 for twenty years w.e.f. 28.10.2012 the lease area as per CEC Survey was 161.54 Ha. However lease renewal was done for 160.59 ha (Annexure-1). Hence this area of 160.59 Ha. is consider for this Mining Plan..

The details of lease grant and renewals are as follows:

- Date of first grant: 28-10-1952 for a period of 20 years in the name of A. S. Krishnamurthy over an area of 388.5000 ha as ML No. 248.
- First renewal - Executed on 08.06.1973, for a period of ten years (28.10.1972 to 27.10.1982) over an area of 388.50 ha in favour of A. S. Krishnamurthy as ML No. 1149.
- Second renewal- Executed on 13.05.1983, for a period of ten years (28.10.1982 to 27.10.1992) over an area of 337.91 ha in favour of A.K. Madhava Narain as ML No. 1884.
- Third renewal- Executed on 29.05.1998, for a period of 20 years (28.10.1992 to 27.10.2012) over an area of 163.5000 ha in favour of A. Narrain Mines Pvt. Ltd. as ML No. 2236. In 2005 the name of the mine was changed to M/s Sesa Goa Ltd. (Pl see Annexure-2).
- Fourth renewal- This was executed for twenty years w.e.f. 28.10.2012 over an extent of 160.5900 ha as per lease sketch in favour of Sesa Sterlite Ltd. as ML No. 2677. In 2013, the name of the company was changed to M/s Sesa Sterlite Ltd. (Pl see Annexure-3).

This Mining Plan is approved subject to the conditions / stipulations Indicated in the Mining Plan approval letter No. 279/272/91/BNG
Date: 12-03-2020

OP: SeipadPujar & BVR Acharya


श्रीजीय खान नियंत्रक
Regional Controller of Mines
भारतीय खान ब्यूरो
Indian Bureau of Mines.
बंगलूर / Bangalore - 560 022



During 2015, the name of the company has been changed to Vedanta Limited and this was informed to IBM as well DMG/C&I, Karnataka. The details are given in Annexure-4,5,6.

A Review and Updation of Mining Plan for the period of 2017-18 to 2021-22 has been approved by IBM, vide letter no. 279/272/91/BNG/1934 dated 16.12.2016 with an area of 160.59ha for a production level of 2.29 MTPA.

Subsequently, production limit of this lease has been enhanced to 4.51 MTPA as per the letter of CEC for enhancement of permissible production limit, so a modification to the approved Mining Plan has been approved by IBM for the remaining part of 2017-18 to 2021-22.

A second modification to the above modified approved Mining Plan was approved by IBM on 19.06.2018 for including Siliceous Iron Ore as mineral reserves/resources as per latest IBM threshold limits as well as change in working proposals for the years of 2018-19 to 2021-22.

Third modification to the modified approved Mining Plan was approved by IBM (vide letter no. 279/272/91/BNG/349 dated 21.08.2019, Annexure-7) for the remaining three years (2019-20 to 2021-22) for Updation of Reserve & Resources and enhancement of production program to 7.2 MTPA for obtaining Environmental Clearance as the existing EC is for 6.0 MTPA.

Now, a fourth modification to the approved Review and Updation of Mining Plan including PMCP is being submitted for approval under Rule 17(3) of MCR 2016 and Rule 23 of MCDR 2017 in order to increase the production /development based on the enhancement of production limit of 5.89 MTPA approved by CEC (Annexure-8) for the remaining period of current financial year 2019-20 to 2021-22 respectively and updation of reserves and resources as per latest exploration. The production and development plan during 2021-22 of this plan period will be maintained at 7.2 MTPA as in last approved MP in order



to get the Environmental Clearance for the production of 7.2 MTPA by MOEFCC.

The lease being part of Forest land, has got Forest Clearance which is co-terminus with the lease period (Annexure-9) and an Environmental Clearance is also granted for a production limit of 6.0 MTPA (Annexure-10).

The Lessees are having some mining leases in the state of Goa apart from this lease. However, these leases are not under the custody of the Lessees as of now as per the recent Hon'ble Supreme Court Judgment dated 07.02.2018. And the correspondence and clarification in this regard is under progress with the State Govt.

However, the details of the leases are given as follows:

Table -1:

S #	M. L. No. / T. C. No.	Mining Lease	DGPS Survey Area (Ha)	Village/s	Taluka	District
1	03/AMLG (ML-3)/VL/17	Codli Amalgamated Lease	100.2081	Codli	Dharbandora	South Goa
2	10/1949	Chireachea Ambeacodil Donguri	79.9002	South Maulinguem	Bicholim	North Goa
3	03/1954	Canca Galle Tolop	35.0657	South Maulinguem	Bicholim	North Goa
4	09/1949	Macarxendo	94.7287	South Maulinguem	Bicholim	North Goa
5	76/1952	Orasso Dongor	98.4473	Adwalpale & Moite m	Bicholim & Bardez	North Goa
6	28/1951	Botvadeacho Dongor	23.7344	Pissurlem	Sattari	North Goa
7	06/1955	Marcia Sodo	26.6677	Onda	Sattari	North Goa
8	38/1955	Millem Dongor	100.0000	Dharbandora	Dharbandora	South Goa
9	39/1955	Xirvol Culna	23.9580	Dharbandora	Dharbandora	South Goa
10	26/1955	Cajumol	43.0000	Sancordem	Dharbandora	South Goa
11	32/1955	Pirna E Nadora	43.0000	Pirna & Nadora	Bardez	North Goa



1.0 GENERAL

a)

Table-2:

Name of Lessee	Vedanta Limited <i>Nominated Owner</i> Shri.Sauvick Mazumdar
Mine Code & Rule 45 Registration No.	30KAR07013 IBM/327/2011
Address	SesaGhor, 20, EDC Complex, Patto, Panjim - Goa
District	North Goa
State	Goa
Pin code	403 001
Phone	0832 2460600 (9 Lines)
Fax	0832 2460612
Mobile	9765565524
E-mail id	Sauvick.Mazumdar@vedanta.co.in

b) Status of Lessee:

Limited Company

(Copy of Certificate of Company Registration enclosed as Annexure-4, board resolution copy enclosed as Annexure-11, List of Directors as Annexure No-12 and Photo ID of Nominated Owner- Shri.Sauvick Mazumdar is enclosed as Annexure-13)

c) Mineral(s) which are included in the prospecting license (for fresh grant):

Not applicable

d) Mineral(s) which is included in the leased deed:

Iron Ore



e) Mineral(s) which the Lessee intend to mine:

Iron Ore

f) Name of Qualified Persons preparing the Mining Plan:

Table-3:

Name	Sripad Pujar	BVR Achar
Qualification	M.Sc. (Min. Exploration)	M.Sc. (Min. Exploration)
Address	ROCK TECH ENTERPRISES, First floor, Sapthagiri Enclave, College Road Hosapete- 583 201 Ballari Dist. Karnataka	
Phone	08394-226563	
Mobile	9448366964	9448469407
E-mail id	rocktechpt@gmail.com	

(Certificates of qualification/experience enclosed as Annexure-14)



2.0 LOCATION AND ACCESSIBILITY

a) Lease Details

Table -4:

Name of the mine	ML no. 2677 of Vedanta Ltd
Lat/long of boundary point	Corner Point LBC-1, Latitude - 14° 13' 34.1" Longitude - 76° 12' 29.1"
Date of grant of lease	First grant: 28.10.1952, Fourth Renewal: 28.10.2012
Period/Expiry Date	20 years, Up to 27.10.2032
Postal Address	Meghalahalli Office Complex, Near Meghalahalli Village, Bheemasamudra
District	Chitradurga
State	Karnataka
Pin code	577501
Phone	08194 -238 110
Fax	08194 -238 170
Mobile	8762048405 / 9483211966
E-mail id	Sauvick.Mazumdar@vedanta.co.in MK.reddy@vedanta.co.in

There are 16 corner pillars and lat/long values of these pillars are listed in the Table -7 below.

b) Detail of lease area:

Table - 5:

Forest	Non-forest
Nirthadi Reserve Forest, Holalkere Range Area-160.59 Ha	--

Table -6:

Total lease area	160.59 ha
District & State	Chitradurga Dist., Karnataka State
Taluka	Chitradurga and Holalkere
Village	Meghalahalli, Bommaravvanagathihalli, Madakeripura, Chowdenahally, Tanigehalli, Hirekandavadi
Whether the area falls under Coastal Regulation Zone (CRZ)?	No
Existence of public road/railway line, if any nearby and approximate distance	BBH Railway siding (private) is the nearest railway siding is located at about distance of 3.5kms from the mine head, also public road connecting to Meghalahalli village is at the distance of 1.3kms from mine head.
Toposheet No. with latitude & longitude of all corner boundary point/pillar	Toposheet No.- 57 B/4 Lat / Long values as per lease deed are given in table below

Table – 7: Latitude and longitudes of the corner pillars

Sl. No	Lease Corners	Co-ordinates	
		Northing	Easting
1	LBC-1	14°13'44.1"	76°12'29.1"
2	LBC-2	14°13'46.7"	76°12'24.5"
3	LBC-3	14°14'17.2"	76°12'09.7"
4	LBC-4	14°13'56.5"	76°11'45.1"
5	LBC-5A	14°13'45.1"	76°11'55.4"
6	LBC-6A	14°13'55.3"	76°12'06.9"
7	LBC-7A	14°14'04.4"	76°12'06.5"
8	LBC-8A	14°14'07.0"	76°12'13.2"
9	LBC-9	14°13'47.6"	76°12'22.6"
10	LBC-10	14°13'33.3"	76°12'05.5"
11	LBC-11	14°13'19.4"	76°12'18.3"
12	LBC-12	14°13'17.4"	76°12'11.0"
13	LBC-13	14°12'54.3"	76°12'31.3"
14	LBC-14	14°13'17.1"	76°12'58.3"
15	LBC-15	14°13'33.9"	76°12'36.2"
16	LBC-16	14°13'37.5"	76°12'28.3"



The GCP points are cement structures made at that points as there are no permanent points nearby lease area (within 100m). These are shown in Surface Plan and photographs of boundary pillars and GCP are enclosed.

Table - 8: Three ground control points (GCP)

GCP No.	Co-ordinates		Elevation (MSL)	Distance from BP14
	Northing	Easting		
1	N14° 13' 15.4"	E76° 12' 57.1"	843 m	63.15m
2	N14° 13' 15.0"	E76° 12' 57.5"	843 m	67.99m
3	N14° 13' 14.6"	E76° 12' 58.2"	842 m	76.94m

c) Location Map:

A general location map is attached as Plate-Ia as administrative map and precise map showing area and access routes are marked on Survey of India topographical map of 1:50,000 scale as Plate-Ib.

A copy of sketch for lease along with extended area issued by DMG, Karnataka is enclosed as Plate-Ic and Copy of Vectorised Cadastral DGPS map is enclosed as Plate-Id.

**3.0 DETAILS OF APPROVED MINING PLAN:****3.1) Date and reference of earlier approved Mining Plan**

Table-9

Period	MP/SOM	Approval details	Remarks
2012-13 to 2016-2017	MP	No. KNT/CTD/MP/Fe-263-SZ/966 dated 21.11.2012	First MP after fourth renewal of mining lease
2017-18 to 2021-2022	RU MP	No. 279/272/91/BNG/1934 dated 16.12.2016	Review & Updation of MP

3.2) Details of last modifications - if any (for the previous approved period) of approved MP/SOM, indicating date of approval, reason for modification

Table-10

Period	Modifications	Approval details	Reasons
2017-18 to 2021-2022	First modification of RU MP	letter no. 279/272/91/BNG/1097 / 28 dated 23.03.2018	To incorporate the production limit approved by CEC that is 4.51 MTPA
2018-19 to 2021-2022	Second modification of RU MP	letter no. 279/272/91/BNG/1097 dated 20.06.2018	To incorporate the Hematitic Siliceous Ore in reserves / resources
2019-20 to 2021-2022	Third modification of RU MP	letter no. 279/272/91/BNG/349 dated 21.08.2019	To incorporate updation of reserves/resources, change in production planning and production of 7.2 MTPA to get EC from MOEFCC

3.3) Review of earlier approved proposal in respect of excavation, exploration, reclamation etc.**Excavation:**

Table-11: Production and Development details

Year	Production (million tonnes)			Development (million tonnes)			Ore : Waste	
	Proposed	Actual	Deviation	Proposed	Actual	Deviation	Proposed	Actual
2017-18	2.437	2.2885	-6.09%	1.8116	1.8165	+0.27%	1: 0.74	1: 0.79
2018-19	4.509	4.508	-	3.256	2.648*	-18.67%	1: 0.72	1: 0.60
2019-20	4.510	4.427 [#]	-	1.563	2.263 [#]	-	1: 0.35	-
2020-21								
2021-22								

*The deviation in development quantity was due to non-availability of loading units.

The production and development quantities are upto Jan 31st 2020 only.



Year	ROM-Iron Ore-Tonnes			Total waste (OB/SB+ BHQ + Rehandled waste)	ROM Waste Ratio
	Normal Ore +45% Fe	Hematitic Siliceous Ore +35% Fe	Total		
2019-20*	2,871,600	163,890	3,035,490	1,079,435	1: 0.36
2020-21	3,889,200	618,570	4,507,770	3,202,725	1: 0.71
2021-22	6,772,950	433,215	7,206,165	6,154,120	1: 0.85

Exploration: 14 nos. boreholes with a total meterage of 5180m were proposed in 2019-20 to establish depth persistence of siliceous as well as normal ore. However, lessee has drilled 15nos. core boreholes for a total depth of 4969.6m during 2019-20. The details of these holes are given in section 1.0 e (ii). Annexure-15 shows Form-I& Annexure-27 shows Chemical Analysis report.

Reclamation: No proposals in the earlier plan period.

3.4) Status of compliance of violations pointed out by IBM

Details of violations of provisions of MCDR, issued by IBM vide letter no. KNT/CTD/Fe-04/BNG/Vol-III Dt. 31st Aug 2017 and compliance submitted are given below. (Annexure -16a).

Table- 12:

Rule	Details of Violations	Compliance
11(1)	The deviations observed in mining operations vis-a-vis approved Mining Plan document are given below: (1) It was proposed to form/ develop benches of 7m height in both the blocks, whereas the height of benches observed 8m to 9m against the proposed height of 7m at places (2) It was proposed to dump waste in dump no.3, whereas it is observed that part of waste dumped in dump no.4.	(1) As proposed to develop benches of 7m height for safer operations and safety berms of 1.5 to 2 meters are provided over and above bench height at edge of the benches. However actual height of the benches are kept at 7 meters only. (2) We have dumped waste only in dump number 3 as per approved mining plan. Waste dumping is not started in DUMP number 4.
13(2)	The benches in overburden have not been sufficiently kept in advance. The width of benches observed less than the height at several places	All working benches in overburden are kept with average width of 10 meters, as per approved mining plan.



33	A high-resolution satellite images obtained from CARTOSAT-2 satellite LISS-IV sensor on the scale of cadastral maps, covering the mining lease and an area of two kilometers from the lease boundary has not been submitted as required under the rule.	It was submitted on 10.01.2017
45(5) a (1)	The production for the month of June, 2017 is reported as 254,261 Tonnes, against the target of 190,833t as per 12 months period. Further, the processed ore is reported as 324,675t, which is more than the production figure indicated above.	There is no restriction on monthly production. Total ROM production achieved till June 2017 is 12,30,078 MT which is well within CEC approved annual production capacity. Processed ore reported for the month is 251,264 MT, which is less than ROM production.
45(5) b(i)	In annual return, part-I, sl.no 12(iii), the lease area utilization at the end of the year, the area reclaimed/rehabilitated given as 23.24 ha, but the same is not found in ML area. Besides, the same area also not brought out in the approved mining plan document, if it is undertaken in the ML area, which is not appropriate and correct. This need to be updated and corrected suitably in the annual returns and wherever is applicable.	In annual return, part-I, sl.no 12(iii) the lease area utilization at the end of the year, it is shown under reclaimed/rehabilitated as 23.24 ha. Since plantation area is above the dump area so these areas can be considered in waste dump area only instead of reclaimed/rehabilitated area. In subsequent annual and other returns these are corrected.

Details of violations of provisions of MCDR-2017, issued by IBM vide letter no. KNT/CTD/Fe-04/BNG/Vol-IV dated 13th Aug 2018 and compliance submitted are given below. (Annexure -16b).

Table- 13:

Rule	Details of Violation	Compliance
11(1)	<p>It was proposed in the Modification & review of Mining Plan approved vide letter No. 279/272/91/BNG/24 dated 23/03/2018 for the period 2018-19 to 2021-22. The deviations observed in mining operations vis-à-vis approved document are;</p> <p>The proposed development and production as per the year 2017-18 and 2018-19, given in plan 7 sections of plate NO.(III/a & b), to develop the benches on the southern end of the south block with bench height of 7m & width of more than 8m, but on the day of inspection, it was observed and found that the benches towards SSW side found all the benches have been broken and collapsed without any systematic benches as shown in the plate thereby caused working in contrary to the approved document. Thus, the violation of unsystematic working has been observed.</p>	<p>Since SSW side of pit is our major working area, development is concentrated in almost all the benches which include blasting in top hard laterite benches and excavation in soft friable strata. Therefore, during your field visit benches in all these areas were appearing in haphazard shape. We have developed this area in systematic manner by maintaining all working bench height of 7 m and width of more than 8 m as given in our approved Mining Plan for the year 2017-18 and 2018-19. We have attached recent photographs of the same area showing systematic development for your ready reference</p>

Details of violations of provisions of MCDR-2017, issued by IBM vide letter no. KNT/CTD/Fe-04/BNG/Vol-IV/157 dated 30th July 2019 and compliance submitted are given below. (Annexure -16c).



Table- 14:

Rule	Details of Violation	Compliance
11(1)	<p>i) It was observed that the production and development plan was deviated from the proposal towards southern side in between section line 3A-3A' to 5A-5A'.</p> <p>ii) It was noticed that siliceous ore had not been worked out in between section line section 7A-7A' to 9A-9A', thus resulting in no generation of mineral reject and lowering of stripping ratio.</p> <p>iii) Retaining wall was not constructed as per the approved document against the proposal of 409 mts.</p>	<p>i) The modification in proposals of production & development work at sections 3A-3A' to 5A-5A' for the year 2019-20 is made in latest modified approved mining plan (letter no 279/272/91/ BNG dated 19/8/2019).</p> <p>ii) The proposals of production & development work at sections 7A-7A' to 9A-9A' is made in latest modified approved mining plan (letter no 279/272/91/ BNG dated 19/8/2019). The parking yard and workshop will be removed in the year 2019-20 simultaneously as benches are progressing. Working in this part of the pit is already started; photographs of the same are attached. This part of working is necessary to facilitate the backfilling in next plan period.</p> <p>iii) With reference to approved mining plan the area identified for construction of retaining wall was 409 mts i.e. 168 mts in dump3 and remaining 241 mts was proposed in new office area. Out of this 168 mtrs is already constructed in dump 3 area and remaining construction is proposed in latest approved MP.</p>
26(2)	Yearly report on PMCP setting forth the extend of protective and rehabilitative work carried out as per the approved Progressive Mine Closure Plan has not been submitted till date.	Soft copy of yearly report of PMCP returns was submitted to your good office through email, hard copy of the PMCP returns is also sent to your good office on the same date. Copies enclosed for ready reference
45(7)	<p>Following deficiencies were observed in the annual Returns submitted:</p> <p>i) As per the approved document no area is considered as fully reclaimed and rehabilitated, whereas 23.24 ha is shown in annual returns. (refer part I of annual returns)</p> <p>ii) Ex-mine price is given for ores even though there is no dispatch of lumps & fines. (ref Part IV of the Annual Returns)</p> <p>iii) The Royalty, DMF & NMET may be given separately for calculating the cost of production. (ref part VII of the annual returns)</p>	<p>i) In annual return, part-I, sl.no 12(iii) the lease area utilization at the end of the year, it is shown under reclaimed/rehabilitated as 23.24 ha. Since plantation area is above the dump area so these areas can be considered in waste dump area only instead of reclaimed / rehabilitated area. In subsequent annual and other returns these will be corrected.</p> <p>ii) Annual returns part IV, will be referred back and corrections in Ex-mine price for the non-dispatched lumps and fines will be corrected accordingly.</p> <p>iii) Royalty on dispatched material is paid by the buyer therefor it is not considered as part of our cost of production. There is no option to mention DMF and NMET separately in cost of production in online annual return form, therefor it is mentioned together into others section.</p>

Details of violations of provisions of MCDR-2017, issued by IBM vide letter no. KNT/CTD/Fe-04/BNG/Vol-IV/917 dated 11th Dec 2019 and compliance submitted are given below. (Annexure -16d).



Table- 15:

Rule	Details of Violation	Compliance
11(1)	<p>Modified RMP with PMCP was approved vide letter no.279/272/91/BMG/24 dated 23.03.2018 for a period of 2018-19 to 2021-22. The deviations observed in mining operations vis a vis approved document is given below:</p> <p>i) It was observed that the production and development plan was deviated from the proposal towards southern side in between section line 3A-3A' to 5A-5A'.</p> <p>ii) It was noticed that siliceous ore had not been worked out in between section line 7A-7A' to 9A-9A', thus resulting in no generation of mineral reject and lowering of stripping ratio.</p>	<p>Due to presence of Limonitic Ore Bench, we faced huge quality issues. Due to quality issues we had slightly deviated from approved plan in the section 3A-3A' to 5A-5A'. However same has been submitted to your good office for modification. The modification in proposals of production & development work at sections 3A-3A' to 5A-5A' for the year 2019-20 were approved in latest modified approved mining plan (letter no 279/272/91/ BNG dated 19/8/2019). Currently working is done as per latest approved mining plan without any deviation.</p> <p>ii) The proposals of production & development work at sections 7A-7A' to 9A-9A' is made in latest modified approved mining plan (letter no 279/272/91/ BNG dated 19/8/2019). We have started working in this area as per the approved production and development plan for FY 2019-20. Till date 6010 tonnes of siliceous ore is produced from the above said sections. By end of FY 2019-20 proposed annual production quantity of siliceous ore will be produced.</p>

3.5) Indicate and give details of any suspension/closure/prohibitory order issued by any Government agency under any rule or Court of law:

Not applicable as mine is operating in this plan period.

3.6) In case the MP/SOM is submitted under rule 11 of MCDR 2017 or under rule 17(3) of the MCR 2016 for approval of modification, specify reason and justification for modification under these rules.

A fourth modification to the approved Review and Updation of Mining Plan including PMCP is being submitted for approval under Rule 17(3) of MCR 2016 and Rule 23 of MCDR 2017 in order to increase the production /development based on the enhancement of production limit of 5.89 MTPA approved by CEC for the remaining period of current financial year 2019-20 to 2021-22 respectively and updation of reserves and resources as per latest



exploration. The production and development plan during 2021-22 of this plan period will be maintained at 7.2MTPA as in last approved MP in order to get the Environmental Clearance for the production of 7.2MTPA by MOEFCC.

R&R works:

For protection of the mining area and to prevent further degradation of land and stabilization of dumps, protective measures proposed in the R&R plan has already been carried out. The details are given below:

Table-16:

Description	Proposed	Work done
Retaining walls at toe of waste dump		
(i) R-R dry stone masonry (D1 +D2 +D3 + D4)	34040 m ³	34040 m ³ / annum
(ii) C-C 1:4:8 in foundation (D1 +D2 +D3 + D4)	1684.99 m ³	1684.99 m ³ / annum
Garland drain (1 m bottom width, 2 m top width and 1 m deep in all terraces) for D1+ D2+ D3 + D4	8376 m ³	8376 m ³ / annum
	8076 m ³	8076 m ³ / annum
Garland drain (1 m bottom width, 2 m top width and 1 m deep in inclined chutes) for D3 + D4	180 m ³	180 m ³ / annum
	180 m ³	180 m ³ / annum
Retaining walls at intermediate locations of waste dump		
(i) R-R dry stone masonry (D3 + D4)	8131.5 m ³	8131.5 m ³ / annum
(ii) C-C 1:4:8 in foundation (D3 + D4)	623.42 m ³	623.42 m ³ / annum
Construction of chute at the gully for D2		
(i) CC 1:3:6 in foundation	55.8 m ³	55.8 m ³ / annum
(ii) R-R stone masonry in cement mortar 1:5 in side walls	90.0 m ³	90.0 m ³ / annum
(iii) R-R stone masonry in bed of the drain	27.0 m ³	27.0 m ³ / annum
(iv) Stone pitching on both banks	339.0 m ³	339.0 m ³ / annum
Construction of sump and drop walls for D2		
(i) CC 1:3:6 in foundation of the sump	31.98 m ³	31.98 m ³ / annum
(ii) R.R 1:5 in walls of the sump	25.00 m ³	25.00 m ³ / annum
(iii) R.R 1:5 in front wall	45.00 m ³	45.00 m ³ / annum
(iv) R.R. 1:6 in drop walls	18.75 m ³	18.75 m ³ / annum
(v) CC 1:3:6 in foundation of the drop wall	24.18 m ³	24.18 m ³ / annum
Additional R&R works :		
Construction of retention wall – D3 dump	409m	409m

PART-A**1.0 GEOLOGY AND EXPLORATION:****a) Physiography:**

The total mine lease area forms part of Nirthadi Reserve Forest Area. It is situated on a hill range located between the villages of Meghalahalli and Madakeripura, trending NNW to SSE. The vegetation is sparse to medium in the hill ranges. The crest of the range forms a narrow plateau with an elevation ranging from 940m to 960m above MSL. Four seasonal nallahs, two each on the western and eastern flanks drain the rain waters. The maximum and minimum elevations encountered in the lease area are 960m and 805 above MSL respectively.

The climate of Chitradurga district, which is in the south-west part of the Deccan plateau, is marked by hot summer months, low rainfall and a pleasant winter season. The temperature is around 14° to 17°C during November and December months and goes up to 40° to 41°C during April and May months of the year. The monsoon season extends over a period of six months from June to November. The district receives almost an equal amount of rainfall during the South-west monsoon (June to September) and during the North-east monsoon period (October to November). The average annual rainfall in the district is 580 mm with an average of 40 rainy days. The average annual rainfall in the mine site is 904mm. July happens to be the month receiving highest rainfall which is about 167.7mm average during the period 2001 to 2016. The relative humidity is high during the monsoon ranging between 70% to 75% and remains low in the rest of the year, particularly in the summer months. Winds are generally moderate during summer and strong during rainy season. In the South-west monsoon period, the winds blow mainly from a south-westerly or westerly direction. In the rest of the year the winds are predominantly from directions between north-east and south-east.

**b) Regional Geology:**

The important geological rock formations in the district are crystalline schists, granitic gneisses and the newer granites with few intrusive dykes, all belonging to the oldest rock formations. The schists and their associated rocks constitute a portion of the Dharwar system and are designated as the Chitradurga and the Chikanayakanahalli schist belt. The schistose rocks consist of a complex series of crystalline schists, quartzite, limestone, manganiferous clay schists and banded iron ore formation.

The granitic gneisses occupying a large part of the district are grouped under a separate formation under the title "Peninsular Gneiss" that include a heterogeneous mixture of several types of granitic rocks with enclosed lenses and patches of hornblende schist. Peninsular gneisses are usually banded in appearance and are of light to dark grey in colour and form excellent building stones. On weathering, they yield red lateritic soils. Peninsular gneisses are found in Challakere, eastern parts of Hiriyur and Hosadurga taluks and in some patches of Chitradurga and Holalkere taluks.

c) Geology of the lease area:

The terrain in which the mine is situated comprises of Dharwarian formation that falls under the Chitradurga – Shimoga schist belt. The lease area forms a narrow plateau with iron ore situated at the top of the hill under a capping of laterite rocks having strike length of 2km and the strike direction being NW – SE dipping 50–60° towards southwest. In the upper level of the ore body, the amount of dip is low whereas at deeper level the dip will be gradually increasing, ultimately reaching to vertical. It is confirmed by the exploration that, the structure of the ore body exhibits a synclinal formation reaching to a maximum depth of 280m from surface whereas anticline shows decomposed



BHQ, which is exposed at surface along the strike line. Rich iron mineralization is concentrated at the trough area.

The ore zone in the mine is bifurcated by another lease, (RPC Mines) into two blocks namely south and north blocks and are connected by a narrow strip of land at the foot hill on the eastern side. Each block is being worked in a separate pit although the same ore zone is running across these blocks as well as other lease.

The northern block is at higher elevation (920mRL) having an ore body of 700m length with width of 20-40m running NW-SE direction with dip of 50-60 deg towards southwest. This is enclosed by weathered phyllites and schists on either side.

The southern block is at lower elevation (860mRL) having ore zone of strike length of about 1500m in NE - SW dipping 50-60 deg towards south west. The hanging and footwall consist of weathered phyllites and schists.

The general order of superposition of the ore zone in the lease area is as follows:

Table-17:

Lithology	Fe %
Iron Ore	45 to 62
Hematitic Siliceous Ore	+35
BHQ	+25- 35

At places limonitic ore and manganese ore/ manganiferous clay pockets are also noticed at hanging wall. Weathered dolerite dyke cuts across the ore body. Gabbros as intrusion are also present at extreme northern side of the lease area. The quartz vein running at the toe of the eastern side of the hill is varying from two meters to five meters width.

Iron ore: The ore zone consists of powdery and lumpy ore. Lumpy ore occurs as disseminated boulders of various sizes whereas Powdery ore is soft and



friable in nature. Strike direction being NW – SE dipping 50–60° towards southwest, places the ore zone is covered by capping of laterite. The size distribution of this material is about 15-25% (+10mm) lumps and remaining 75-85% is fines (-10mm). It is confirmed by the exploration that; the ore body is reaching to a maximum depth of 320m from surface.

It is observed that laterally the grade will be higher at the center of the ore body and gradually will decrease towards hanging wall. The physical characteristic of the ore shows bluish as well as cherry reddish in color and of medium to hard in nature with tumbler index of around 75%.

The chemical analysis of ROM is as follows:

Fe	45 - 62 %
Mn	0.5 to 7 %
SiO ₂	2 to 7.5 %
Al ₂ O ₃	1.8 to 3%

Phyllitic clays:Phyllitic clays are mostly found below the ore body. Thickness varies from few meters.

Limonitic clays:Limonitic clays are also found in hanging wall. These are yellowish in colour and vary in thickness from few centimeters to few meters.

Manganiferous clay:Manganiferous clay is black in color & contains about 0.5-7% of manganese. It occurs both as hanging wall & footwall due to minor folding and thickness varies from few centimeters to meters.

HematiticSiliceous ore:Siliceous ore is present within Iron ore band especially towards south block as lenses and pockets. The strike direction is same as iron ore, being NW – SE and dipping 50–60° towards southwest. Depth of occurrence is also in line with the iron ore.

Hematitic siliceous ore exists in both F/W and H/W side of the ore zone connected to main iron ore body as evidenced by drilled borehole data and surface geological exposure. This ore analyses +35% Fe and >40% silica. It is extend further to a depth of about 320m from the surface. This ore is nothing but



partly weathered BHQ where in some part of free silica is leached out. This layer is of 30m to 40 m in thickness. The size distribution of this material is about 20-25% lumps (+10mm) and remaining 75-80% is fines (-10mm). Lumps are of better grade (+50% Fe) and fines are of lower grade (~40% Fe). Pl refer IBM report on Haematitic Siliceous ore (Annexure-18).

It is confirmed by the exploration that; the ore body is reaching to a maximum depth of 300m from surface. As we go deeper, this Haematitic siliceous ore zone is followed downward by fragmented BHQ and then hard massive BHQ.

The chemical analysis of the haematitic siliceous ore is as follows:

Fe	35 - 45%
Mn	0.5 to 2.5 %
SiO ₂	30 to 40 %
Al ₂ O ₃	0.9 to 2.5%
P	0.01 to 0.08%

BHQ: This banded iron formation is hard to medium hard in nature and at places the quartzite band is converted to shale/phyllite. This may be called shaly BHQ. The strike direction is same as iron ore, being NW – SE and dip is almost vertical. The grade varies from 25-35% Fe. The drilling data of a borehole drilled upto 575m depth confirms BHQ is extending with descending grade.

Annexure-27 shows the chemical analysis reports of boreholes drilled.

d) Prospecting/Exploration:

Table-18: Details of Exploration agency

Name	M/s Kartikay Exploration and Mining Services Pvt. Ltd.	M/s South West Pinnacle Exploration Ltd
Drilling Period	2018-19	2019-20
Address	Civil lines, NAGPUR Maharashtra-India	Gurgaon, Haryana



E-mail id	ali.reyaz@kartikay.co.in	Manik.jain@southwestpinnacle.com
Phone	7887869427	8800095408

- e) **Detailsofprospecting/explorationalreadycarriedout**
i) **Numberofpitsandtrenchesindicatingdimensions,spacingetcalongandaacrossthestrike/foliationwithreferencetogeologicalplan.**

No pitting/trenching was carried out.



- ii) Number of boreholes indicating type (Core/RC/DTH), dia, spacing, inclination, Collar level, depth etc with standard borehole logs duly marking on geological plan/sections.

Table-19

Year	No. of boreholes	Grid interval	Total meterage	No. of Pits	No. of Trenches
2018-19	17-Core	50m x 50m	3950.20m	--	--
2019-20	15-Core	50m x 50m	5276.10m	--	--

Table-20: Details of Core Bore Holes drilled during 2018-19

BH no.	LOCATION (UTM)		Level (mRL)		DEPTH (m)	INCLINATION (degree)
	NORTHING	EASTING	Top	Bottom		
ANDD331	1572553.277	630169.435	877.436	653.736	223.70	80
ANDD332	1573837.988	629364.832	929.530	702.53	227.00	75
ANDD333	1574198.945	629604.228	917.282	729.282	188.00	75
ANDD334	1573808.833	629305.724	911.999	696.999	215.00	90
ANDD335	1573947.754	629330.969	893.405	750.405	143.00	55
ANDD336	1573759.552	629564.311	914.280	604.28	310.00	70
ANDD337	1572437.344	630178.427	855.693	530.693	325.00	70
ANDD338	1573873.244	629547.269	926.610	627.61	299.00	60
ANDD339	1573704.541	629497.195	909.583	609.583	300.00	70
ANDD340	1573855.059	629522.432	926.269	681.269	245.00	80
ANDD341	1574072.104	629808.593	887.550	769.55	118.00	80
ANDD342	1573796.519	629457.484	929.710	696.71	233.00	80
ANDD343	1573703.338	629496.530	909.475	608.975	300.50	90
ANDD344	1572508.556	630702.665	899.364	666.364	233.00	60
ANDD345	1572952.687	630533.964	859.155	647.155	212.00	75
ANDD346	1573705.957	629356.826	905.456	616.456	289.00	70
ANDD347	1573072.895	630148.549	900.247	811.247	89.00	90

Table-21: Details of Core Bore Holes drilled during 2019-20

BH no.	LOCATION (UTM)		Level (mRL)		DEPTH (m)	INCLINATION (degree)
	NORTHING	EASTING	Top	Bottom		
ANDD348	1571945.54	630396.23	838.49	272.49	566.00	65
ANDD349	1573619.33	629418.48	880.21	613.21	267.00	90
ANDD350	1573772.70	629159.02	848.38	589.88	258.50	55
ANDD351	1572839.41	629893.99	854.86	470.36	384.50	85
ANDD352	1572458.45	630083.44	842.82	205.32	637.50	75
ANDD353	1573629.73	629280.69	881.26	538.86	342.40	80
ANDD354	1573889.72	629279.79	879.74	670.44	209.30	75
ANDD355	1573702.60	629212.74	885.10	565.1	320.00	90
ANDD356	1573187.08	629837.12	856.85	562.85	294.00	60
ANDD357	1572477.77	630240.68	866.93	487.93	379.00	60
ANDD358	1573619.33	629418.48	885.00	575	310.00	65
ANDD359	1572524.05	630210.78	870.63	670.63	200.00	70
ANDD360	1573629.71	629279.57	881.05	577.65	303.40	65
ANDD361	1572954.44	629874.64	841.39	691.39	150.00	70
ANDD362	1573145.41	629782.38	873.02	218.52	654.50	65



Table -22: Summary of total boreholes drilled

Year	Type	Bore Hole ID	Nos.	Depth (m)
1994-1995	Core	NM-1 to NM-4	4	188
	DTH	D-1 to D-86	86	3281
1998-1999	DTH	D-87 to D-129	43	1900
1999-2000	DTH	D-130 to D-167	38	2432
2001-2002	DTH	D-168 to D-188	21	1090
2004-2005	Core	NM-5 to NM-39	35	3111
	DTH	D-189 to D-203	15	927
2005-2006	Core	NM-40 to NM-51	12	1015
	DTH	D-204 to D-237	34	2772
2008-2009	R.C.	ANRC-1 to ANRC-137	137	15065
2009-2010	Core	ANDD-138 to ANDD 199	62	8040.55
2012-2013	Core	ANDD-200 to ANDD 220	21	5964.70
2015-2016	Core	ANDD-221 to ANDD 314	96	13300
2017-2018	Core	ANDD-315 to ANDD 330	14*	2795
2018-2019	Core	ANDD-331 to ANDD 347	17	3950.2
2019-2020	Core	ANDD-348 to ANDD 362	15	5276.10
TOTAL			650	71083.55

* Borehole nos. 316 & 319 were not drilled

iii) Details of samples analysis indicating type of sample (surface/sub-surface from pits / trenches/borehole etc)

Borehole samples of ore and waste were analyzed in NABL lab. The lithologs of BH are enclosed as Annexure-17. Analysis reports from NABL lab of the latest boreholes drilled are enclosed in Annexure-27.

iv) Expenditure incurred in various prospecting operations:

The cost of exploration carried out during 2019-20 was about Rs. 4.70 crores.

- f) **Surface Plan:** Enclosed as Plate no-II a on a scale of 1:2000
- g) **Geological Plan:** Enclosed as Plate no-II b on a scale of 1:2000
- h) **Geological Section:** Enclosed as Plate no-II c on a scale of 1:2000
- i) **Future program of exploration:**

No proposals as the ML was explored extensively till last year of plan period.

Area under different level of exploration

G1	G2	G3	G4	Other*	Total
99.16 ha	-	-	-	61.43 ha	160.59 ha

*Other is non mineralized area present in NE & SE portion and SW portion between sections 6-10, as per few negative boreholes and geological mapping.



The above areas of exploration are marked in Geological Plan, Plate II b.

j) Mineral Reserves/Resources:

As per previously approved modified Mining Plan, the Reserves/Resources were as follows.

Table- 23: Resources and Reserves in tonnes as on 31.06.2019

Category	UNFC	Normal Iron Ore	Grade (Threshold at Fe +45%)	Hematitic Siliceous Ore	Grade (Threshold at Fe +35%)
A. Total Mineral Reserves					
Proved Mineral Reserve	111	104.616	Average 51.67% Fe	26.458	Average 38.02% Fe
Probable Mineral Reserve	122	-		-	
B. Remaining Resources				-	
Feasibility Mineral Resource	211	0.980		5.682	
Prefeasibility Mineral	221	-		-	
Measured Mineral Resource	331	0.021		6.016	
Indicated Mineral Resource	332	-		-	
Inferred Mineral Resource	333	3.651		1.472	
Reconnaissance Mineral	334	-		-	
Sub Total		4.652		13.170	
Total Reserves + Resources		109.268		39.628	

The above resource/reserves are updated now based on exploration data of 15 boreholes drilled in 2019-20. Following sections describe the methodology of estimation as per UNFC guidelines as well change in reserves / resources after re-estimation as per latest surface geological plan and sections updated on 31.01.2020 using latest exploration data.

Geological cross sections are prepared at 50m interval. Sectional areas are calculated, and cross-sectional areas are multiplied by sectional influence and the volume of the individual lithology was arrived. The area of individual litho units in each cross section is calculated separately.

Proved Mineral Reserves (111) are estimated based on the data of G-I level of exploration (up to 50x50m grid interval) without projecting depth limits beyond the borehole bottom and lateral extensions of extreme boreholes. The



maximum and minimum depth considered as per boreholes drilled in respect of proved ore is 960mRL and 640mRL respectively.

Mineral blocked in the areas of safety zone of 7.5m along the boundary **(Feasibility Mineral Resources-211)** is estimated separately which is not minable where common boundary working permission is not present. Pit slopes will be maintained at 40° wrt horizontal as per local lithology which exhibits more compactness in depth and in line with the practice of surrounding mining areas like RPC. This has decreased the ore blocked due to pit limit.

Inferred Mineral Resources (333) are estimated below proved level based on geological extension of the individual lithology where borehole data is present.

Measured Mineral Resources (331) are proved mineral reserves but present below UPL, hence presently not minable.

Hematitic siliceous ore (35 to 45% Fe) will be dry screened and C. ore /fines will be blended with high grade ore and sold as and when required. Hence, mining of Hematitic siliceous ore is economically viable.

Tonnage is arrived by multiplying volume by its bulk density. Bulk density considered for iron ore is 3.0 ton/cum, 2.70 ton/cum for Hematitic siliceous ore and 1.70 ton/cum for waste. Bulk density tests were carried out at mine site by sand fill method by SGS labs, Hospet. The BD test reports are enclosed as Annexure-18.

Recovery is considered as 100% for iron ore as no intercalations are present in ore zone. Hematitic siliceous ore is also having a recovery of 100% wrt both +10mm Cal ore and -10mm fines, which is detailed below (based on recovery test reports, Annexure-19).

Table – 24

Hematitic Siliceous Ore	Sample 1		Sample 1A		Sample 2		Sample 2A		Average	
	Size%	Fe%	Size%	Fe%	Size%	Fe%	Size%	Fe%	Size%	Fe%
+10mm	19.57	47.85	19.96	50.24	24.53	46.17	29.33	46.64	23.35	47.53

-10mm	80.43	36.53	80.04	36.94	75.47	37.33	70.67	37.39	76.65	37.02
Total	100	38.74	100	39.60	100	39.50	100	40.10	100	39.49




k) Detailed calculation of reserves/resources sectionwise:

Following tables show re-estimation of reserves / resources as per latest surface geological plan/sections updated on 31.07.2020 using latest exploration data.

Table-25: Proved Mineral Reserves (111)

Sections	IRON ORE (+45% Fe)					SILICEOUS IRON ORE (+35% Fe)				
	Area sqm.	Influ Mtr	Volume CuMtr	TF	Quantity tons	Area sqm.	Influ Mtr	Volume Cu Mtr	TF	Quantity Tons
1A-1A'	23244	50	1162200	3	3486600	3503	50	175150	2.7	472905
2-2'	45659	50	2282950	3	6848850	2012	50	100600	2.7	271620
2A-2A'	35476	50	1773800	3	5321400	3024	50	151200	2.7	408240
3-3'	38264	50	1913200	3	5739600	84	50	4200	2.7	11340
3A-3A'	14854	50	742700	3	2228100	0	50	0	2.7	0
4-4'	27801	50	1390050	3	4170150	535	50	26750	2.7	72225
4A-4A'	14343	50	717150	3	2151450	4420	50	221000	2.7	596700
5-5'	32750	50	1637500	3	4912500	4052	50	202600	2.7	547020
5A-5A'	15761	50	788050	3	2364150	3332	50	166600	2.7	449820
6-6'	24165	50	1208250	3	3624750	402	50	20100	2.7	54270
6A-6A'	8739	50	436950	3	1310850	4429	50	221450	2.7	597915
7-7'	5147	50	257350	3	772050	6842	50	342100	2.7	923670
7A-7A'	12522	50	626100	3	1878300	0	50	0	2.7	0
8-8'	2562	50	128100	3	384300	1718	50	85900	2.7	231930
8A-8A'	4692	50	234600	3	703800	1230	50	61500	2.7	166050
9-9'	3505	50	175250	3	525750	706	50	35300	2.7	95310
9A-9A'	5515	50	275750	3	827250	0	50	0	2.7	0
10-10'	4594	50	229700	3	689100	2742	50	137100	2.7	370170
10A-10A'	6124	50	306200	3	918600	3122	50	156100	2.7	421470
11-11'	6840	50	342000	3	1026000	982	50	49100	2.7	132570
11A-11A'	5380	50	269000	3	807000	1502	50	75100	2.7	202770
12-12'	11749	50	587450	3	1762350	3872	50	193600	2.7	522720
12A-12A'	0	50	0	3	0	10624	50	531200	2.7	1434240
13-13'	15051	50	752550	3	2257650	1905	50	95250	2.7	257175
13A-13A'	13796	50	689800	3	2069400	1988	50	99400	2.7	268380
14-14'	14953	50	747650	3	2242950	6028	50	301400	2.7	813780
14A-14A'	16547	50	827350	3	2482050	3673	50	183650	2.7	495855
15-15'	29395	50	1469750	3	4409250	1575	50	78750	2.7	212625
16A-16A'	12138	50	606900	3	1820700	0	50	0	2.7	0
17-17'	21629	50	1081450	3	3244350	26251	50	1312550	2.7	3543885
17A-17A'	28116	50	1405800	3	4217400	25089	50	1254450	2.7	3387015
18-18'	32524	50	1626200	3	4878600	20757	50	1037850	2.7	2802195
18A-18A'	49711	50	2485550	3	7456650	15310	50	765500	2.7	2066850
19-19'	30687	50	1534350	3	4603050	19149	50	957450	2.7	2585115
19A-19A'	25737	50	1286850	3	3860550	2950	50	147500	2.7	398250
20-20'	25193	75	1889475	3	5668425	11498	75	862350	2.7	2328345
TOTAL			33,887,975		101,663,925			10,052,750		27,142,425

OP: Supriya Aggarwal, BVR, Acharya



Table-25: Feasibility Mineral Resources (211)

Sections	IRON ORE (+45% Fe)					SILICEOUS IRON ORE (+35% Fe)				
	Area sqm.	Influ Mtr	Volume CuMtr	TF	Quantity tons	Area sqm.	Influ Mtr	Volume Cu Mtr	TF	Quantity Tons
2-2'	0	50	0	3	0	14878	50	743900	2.7	2008530
2A-2A'	0	50	0	3	0	367	50	18350	2.7	49545
3-3'	0	50	0	3	0	499	50	24950	2.7	67365
5-5'	0	50	0	3	0	1697	50	84850	2.7	229095
12-12'	0	50	0	3	0	4009	50	200450	2.7	541215
12A-12A'	0	50	0	3	0	5816	50	290800	2.7	785160
13-13'	1519	50	75950	3	227850	2850	50	142500	2.7	384750
13A-13A'	2651	50	132550	3	397650	0	50	0	2.7	0
14-14'	0	50	0	3	0	2534	50	126700	2.7	342090
15-15'	0	50	0	3	0	9148	50	457400	2.7	1234980
17-17'	0	50	0	3	0	4999	50	249950	2.7	674865
18-18'	0	50	0	3	0	2270	50	113500	2.7	306450
19-19'	2383	50	119150	3	357450	1648	50	82400	2.7	222480
20-20'	0	75	0	3	0	13291	75	996825	2.7	2691427.5
TOTAL			327,650		982,950			3,532,575		9,537,953

Table-26 : Inferred Mineral Resources (333)

Sections	IRON ORE (+45% Fe)					SILICEOUS IRON ORE (+35% Fe)				
	Area sqm.	Influ Mtr	Volume CuMtr	TF	Quantity tons	Area sqm.	Influ Mtr	Volume Cu Mtr	TF	Quantity Tons
1A-1A'	7380	50	369000	3	1107000	3678	50	183900	2.7	496530
2A-2A'	382	50	19100	3	57300	0	50	0	2.7	0
3-3'	916	50	45800	3	137400	631	50	31550	2.7	85185
3A-3A'	6528	50	326400	3	979200	0	50	0	2.7	0
4-4'	3201	50	160050	3	480150	1436	50	71800	2.7	193860
11-11'	0	50	0	3	0	170	50	8500	2.7	22950
13A-13A'	208	50	10400	3	31200	0	50	0	2.7	0
14A-14A'	367	50	18350	3	55050	95	50	4750	2.7	12825
18A-18A'	4879	50	243950	3	731850	2690	50	134500	2.7	363150
19-19'	0	50	0	3	0	1603	50	80150	2.7	216405
20-20'	1344	75	100800	3	302400	0	75	0	2.7	0
TOTAL			1,293,850		3,881,550			515,150		1,390,905



Table – 27: Measured Mineral Resources (331)

Sections	IRON ORE (+45% Fe)					SILICEOUS IRON ORE (+35% Fe)				
	Area sqm.	Influ Mtr	Volume CuMtr	TF	Quantity tons	Area sqm.	Influ Mtr	Volume Cu Mtr	TF	Quantity tons
1A-1A'	0	50	0	3	0	12157	50	607850	2.7	641195
2-2'	0	50	0	3	0	615	50	30750	2.7	83025
3-3'	0	50	0	3	0	8764	50	438200	2.7	1183140
3A-3A'	0	50	0	3	0	2964	50	148200	2.7	400140
4-4'	217	50	10850	3	32550	7254	50	362700	2.7	979290
4A-4A'	0	50	0	3	0	5987	50	299350	2.7	808245
5-5'	0	50	0	3	0	97	50	4850	2.7	13095
5A-5A'	0	50	0	3	0	113	50	5650	2.7	15255
12A-12A'	0	50	0	3	0	4102	50	205100	2.7	553770
20-20'	0	75	0	3	0	530	75	39750	2.7	107325
TOTAL			10,850		32,550			2,142,400		5,784,480

Reserves estimated by Slice Plan method: Reserves in proved category were estimated by Slice Plan method and are given below:

Table – 28: Proved Mineral Reserves (111) by Slice Plan method

Level mRL.	Iron Ore (+45% Fe)					Hematitic Siliceous Ore (+35% Fe)					G Total tons
	Area sqm.	Influ Mtr	Volume CuMtr	TF	Quantity tons	Area sqm.	Influ Mtr	Volume Cu Mtr	TF	Quantity tons	
940	13251	20	265020	3	795060	0	20	0	2.7	0	795060
920	66892	20	1337840	3	4013520	0	20	0	2.7	0	4013520
900	101759	20	2035180	3	6105540	8896	20	177920	2.7	480384	6585924
880	102588	20	2051760	3	6155280	14785	20	295700	2.7	798390	6953670
860	185095	20	3701900	3	11105700	37988	20	759760	2.7	2051352	13271052
840	175542	20	3510840	3	10532520	88087	20	1761740	2.7	4756698	16009218
820	210888	20	4217760	3	12653280	67153	20	1343060	2.7	3626262	17539542
800	160988	20	3219760	3	9659280	20997	20	419940	2.7	1133838	12287118
780	140088	20	2801760	3	8405280	44052	20	881040	2.7	2378808	11444088
760	140178	20	2803560	3	8410680	48452	20	969040	2.7	2616408	11789088
740	103084	20	2061680	3	6185040	34987	20	699740	2.7	1889298	8674338
720	49180	20	983600	3	2950800	12764	20	255280	2.7	689256	4288056
700	63948	20	1278960	3	3836880	40313	20	806260	2.7	2176902	6013782
680	54898	20	1097960	3	3293880	12832	20	256640	2.7	692928	3986808
660	34258	20	685160	3	2055480	11250	20	225000	2.7	607500	2662980
640	25988	20	519760	3	1559280	10750	20	215000	2.7	580500	2139780
620	14080	20	281600	3	844800	10050	20	201000	2.7	542700	1387500
600	17822	20	356440	3	1069320	15495	20	309900	2.7	836730	1587450
580	0	20	0	3	0	11025	20	220500	2.7	595350	438750
560	0	20	0	3	0	10690	20	213800	2.7	577260	382860
TOTAL	1660527				99631620	500566				27030564	132250584

The reserves are compared with the quantities arrived by cross section method are tabulated in next page.



Table – 29: Proved Mineral Reserves in million tonnes

Method	Iron Ore (+45% Fe)	Hematitic Siliceous Ore (+35% Fe)
Section	101.664	27.142
Slice	99.631	27.031
Difference	2.033	0.111
% difference	2.0%	0.41%

1) Mineral Resources:

Resource/ reserves updated as on 31.01.2020 after re-estimation as per latest surface geological plan and sections updated on 31.01.2020 using latest exploration data and are given below:

Table – 30: Total resources in million tonnes

Level of Exploration	Normal Iron Ore	Grade (Threshold at Fe +45%)	Hematitic Siliceous Ore	Grade (Threshold at Fe +35%)
G1-Detailed Exploration	102.679	Average 51.67 % Fe	42.464	Average 38.02 % Fe
G2 -General Exploration	-		-	
G3-Prospecting	3.882		1.391	
G4- Reconnaissance	-		-	

Reserves and resources within the lease area are arrived after applying results of feasibility and economic evaluation (Annexure-23) of the deposit based on the various factors such as:

- Open cast mining method, recovery factor is 100% for both normal iron ore and siliceous ore as no intercalations are present in ore zone (tentative lumps recovery is 20-30% and fines recovery 70-80%). Recovery test report enclosed as Annexure-19.
- Cutoff grade of +45% for iron ore, +35% for Hematitic siliceous ore, ultimate pit depth of 200m in north block & 300m in south block.
- Mineral / ore blocked at lease boundary (10.517 million tonnes of Feasibility mineral resources-211) where necessary permissions are not available.



The following table gives Resource/ reserves updated as on 31.01.2020 after re-estimation as per latest surface geological plan and sections updated on 31.01.2020 using latest exploration data which has taken care of depletion of reserves by mining for the period between 31.06.2019 and 31.01.2020.

Table – 31: Resources and Reserves in million tonnes as on 31.01.2020

Category	UNFC	Normal Iron Ore	Grade (Threshold at Fe +45%)	Hematitic Siliceous Ore	Grade (Threshold at Fe +35%)
A. Total Mineral Reserves					
Proved Mineral Reserve	111	101.664	Average 51.67% Fe	27.142	Average 38.02% Fe
Probable Mineral Reserve	122	-		-	
B. Remaining Resources				-	
Feasibility Mineral Resource	211	0.983		9.534	
Prefeasibility Mineral Resource	221 and 222	-		-	
Measured Mineral Resource	331	0.032		5.784	
Indicated Mineral Resource	332	-		-	
Inferred Mineral Resource	333	3.882		1.391	
Reconnaissance Mineral Resource	334	-		-	
Sub Total		4.897		16.709	
Total Reserves + Resources		106.561		43.851	

Note: It may not be possible to quantify grade wise reserves, as normally there is considerable variation in size and grade distribution within the ore zone, which results variable recovery factor and bulk density. Thus, tonnages arrived are tentative.



Resources of BHQ-although these are considered as waste as on day-are also estimated from the exploration data. The total Banded Hematite Quartzite resources are at 59.10 million tonnes of average 25-35%Fe.

Table-32: Measured Mineral Resources (331)- BHQ

Sections	Area sqm.	Influ Mtr	Volume CuMtr	Recovery 100%	TF	Quantity tonnes
2-2'	32864	50	1643200	1643200	2.20	3,615,040
2A-2A'	38257	50	1912850	1912850	2.20	4,208,270
4-4'	14932	50	746600	746600	2.20	1,642,520
4A-4A'	7323	50	366150	366150	2.20	805,530
5-5'	14871	50	743550	743550	2.20	1,635,810
5A-5A'	38912	50	1945600	1945600	2.20	4,280,320
6-6'	24332	50	1216600	1216600	2.20	2,676,520
6A-6A'	32629	50	1631450	1631450	2.20	3,589,190
7-7'	27329	50	1366450	1366450	2.20	3,006,190
7A-7A'	45202	50	2260100	2260100	2.20	4,972,220
8-8'	16606	50	830300	830300	2.20	1,826,660
8A-8A'	41813	50	2090650	2090650	2.20	4,599,430
9-9'	30993	50	1549650	1549650	2.20	3,409,230
9A-9A'	19305	50	965250	965250	2.20	2,123,550
10-10'	35338	50	1766900	1766900	2.20	3,887,180
10A-10A'	24161	50	1208050	1208050	2.20	2,657,710
11-11'	11882	50	594100	594100	2.20	1,307,020
11A-11A'	17542	50	877100	877100	2.20	1,929,620
12-12'	11156	50	557800	557800	2.20	1,227,160
12A-12A'	14401	50	720050	720050	2.20	1,584,110
13-13'	8883	50	444150	444150	2.20	977,130
13A-13A'	8067	50	403350	403350	2.20	887,370
14-14'	8233	50	411650	411650	2.20	905,630
14A-14A'	12313	50	615650	615650	2.20	1,354,430
TOTAL						59,107,840

Incidentally the Banded Hematite Quartzite- intersected through the drilled boreholes almost at bottom of the ore body - has been estimated and shown separately which may be utilized in future after upgradation in mineral conservation point of view.



2.0 MINING:

- a) Briefly describe the existing as well as proposed method for excavating without design parameters indicating depths/Sections.

The mine is being operated by fully mechanized open cast mechanized mining method. The mine is currently having two blocks namely south and north blocks bifurcated by RPC Mines and are connected by a narrow strip of land at the foot hill on the eastern side. The lessee is having common boundary working arrangement with RPC mine. (Annexure-21).

Existing workings:

The mine is being worked by opencast fully mechanized mining method, benches are of 7m height and width of more than 8m. Haul road has 12-16 m width and average gradient of 1 in 16 to 1 in 20 gradients except in short ramps. The face slope is around 80° and overall pit slope is being maintained at <40°.

The dimensions of pits in each blocks and other details are summarized below:

Table-33: Existing Working pit details

Block	Extent (Dimension)	Top mRL	Bottom mRL	Bench Nos.	Avg. Height m	Avg. Width m	UTM Co-ordinates	
							Northing	Easting
SOUTH	60.04 ha (L 1410 m x B 428 m)	929.80	783.63	20	7	10	1571942	630873
							1573393	629639
NORTH	9.00 ha (L 513 m x B 176 m)	946.41	905.43	6	7	10	1574254	629665
							1573581	629420

South Block: The pit in this block is running NW-SE direction. There are 20 nos. of benches with height of 7m and avg width is around 10m. The length of these benches varies from 100m to 1200meters. Out of these 20 benches, bottom most seven are in ore zone, four are in waste and remaining nine benches are both ore and waste. The pit slope is maintained at <40°. The top RL and bottom RL of the pit is 929.80m & 783.63m respectively.



North Block: The pit in this block is running N-S. The top RL & bottom RL of the pit is 946.41m and 905.43m respectively. There are six benches running along the strike of the ore zone. The parameters of the benches are very much in accordance with standards i.e., the height of the benches is maintained at 7 meters and width of the benches maintained around 10m. The pit slope is maintained at $<40^\circ$. The length of the existing benches is varying from 100 to 350meters. Out of these six benches, four are in ore and remaining two in both ore and waste.

There are four waste dumps (D1 to D4) existing in the mine area. Out of these two dumps (D1 and D2) are partly stabilized and afforested. Remaining two dumps (D3 and D4) are active dumps. The details and the present status of each dump are as below.

Table – 34: Existing dump details

Dump	Extent (ha)	Qty-MT	Stages	Location	Level MSL	Remarks
D1	17.49	6,208	6	N1574087-15733392 E629530-629021	930-816	Partly stabilized and afforested over an area of 23.24 ha
D2	5.75	7,710	1	N1572533-1571853 E630211-630503	863-801	
D3	22.56	12,778	7	N1572931-1572253 E630490-631178	913-816	Active dumps
D4	20.54	0,096	7	N1573497-1572710 E630046-630713	893-830	

Table – 35: Protective works carried out for existing dumps

Description	Qty.
Retaining walls at toe of waste dump	
(i) R-R dry stone masonry (D1 + D2 + D3 + D4)	34040 m ³
(ii) C-C 1:4:8 in foundation (D1 + D2 + D3 + D4)	1684.99 m ²
Garland drain (1 m bottom width, 2 m top width and 1 m deep in all terraces) for D1+ D2+ D3 + D4	8376 m ³
	8076 m ³
Garland drain (1 m bottom width, 2 m top width and 1 m deep in inclined chutes) for D3 + D4	180 m ³
	180 m ³
Retaining walls at intermediate locations of waste dump	

**vedanta**

transforming elements

Vedanta Limited
Mining Lease No. 2677MODIFICATION TO THE APPROVED
REVIEW & UPDATION OF MINING PLAN

- | |
|--|
| (i) R-R dry stone masonry (D3 + D4) |
| (ii) C-C 1:4:8 in foundation (D3 + D4) |

**Existing mineral stocks:**

The mine is having stacks of around 8.42 lakh tonnes of incidental siliceous ore of 35 to 45% Fe is already stacked over D1, which is existing since July 2009. The Top RL is 911m and Bottom RL 839.49m and it is from Section 16A to 18 towards north west portion of north block.

Proposed workings: The proposed method of working will be fully mechanized opencast, by forming benches of 7m height and width of around 10m. The benches will be advanced towards southwest in south block, whereas towards east in north block. In south block Dump D2 will be re-handled during pit movement in sections 2- 7 towards H/W side.

The workings are planned in such a way that levels are matched with adjacent RPC mine where common boundary workings are made. Haul road has 12-16 m width and average gradient of 1 in 16 to 1 in 20 gradients except in short ramps. The face slope will be around 80° and overall pit slope will be maintained at <40°. Ultimate pit limit is up to 560mRL in South block and whereas in North block the ultimate pit level is up to 620mRL.

b) In situ Tentative Excavation

CEC has given approval for enhancement of production quantity of 5.89 MTPA. A production of 0.472 MTPA has been planned for current year (2019-20) and 5.89 MTPA is proposed during 2020-21. and during 2021-22 production will be maintained at 7.2 MTPA as per previous approved modified Mining Plan. However, production of 7.2 MTPA will not be taken up in 2021-22 unless EC for that quantity is granted by MOEFCC.

The mine is being worked at both blocks (South & North) simultaneously to maintain the consistency of ore quality throughout the life of the mine and



conservation of the mineral resources. Recovery is considered as 100% for iron ore and as no intercalations are present in ore zone. Hematitic siliceous ore is also having a recovery of 100% wrt both +10mm Cal. ore and -10mm fines.

Bulk density considered for iron ore is 3.0 ton/cum, Hematitic siliceous ore 2.7 ton/cum and 1.70 ton/cum for waste. Bulk density tests were carried out at mine site by sand fill method by SGS labs, Hospet. This and recovery analysis reports are enclosed in Annexure-17.

Hematitic siliceous ore of +10mm Cal ore will be sold directly as it is of +45% and -10mm fines will be blended with high grade fines and marketed to major steel producers like JSW as it will of better quality with low Mn, P and Al_2O_3 .

Tentative quality of ore with respect to Fe% required to make it suitable for marketing the ore produced will be arrived after proper blending of normal and siliceous ore. The details of the blending ratio for all types of ore is given below:

Table-36: Blending Plan

Year	Item	Normal Ore			Siliceous Ore			Sub Total		Total Product
		Fines	Lumps	Product	Fines	Lumps	Product	Fines	Lumps	
2019-20	Tonnes	377,520	94,380	471,900	--	--	--	377,520	94,380	471,900
	Fe%	57.80	60.30	58.30	--	--	--	57.80	60.30	58.30
2020-21	Tonnes	4,385,760	1,096,440	5,482,200	264,830	142,601	407,430	4,650,590	1,239,041	5,889,630
	Fe%	59.00	61.50	59.50	35.05	38.05	43.10	57.64	61.10	58.37
2020-21	Tonnes	5,191,800	1,297,950	6,489,750	461,653	248,582	710,235	5,653,453	1,546,532	7,199,985
	Fe%	58.15	60.36	58.39	35.69	38.69	43.74	56.32	60.09	57.13

Table- 37: Insitu Tentative Excavation- in Cum

Year	Block	Total tentative Excavation	Top Soil	OB/SB /IB	ROM-Iron Ore			Mineral Rejects	ROM/ Waste Ratio
					Normal Ore	Hematitic Siliceous ore	Total		
1	2	3	4	5	6	7	8	9	10
2019-20*	South	278300	-	121000	157300	0	157300	-	1: 0.77
	North	0	-	0	0	0	0	-	-
	Total	728300	-	121000	157300		157300	-	1: 0.77

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2020-21	South	2601450	-	1468085	1558250	150900	1709150	1:0.85
	North	269150	-	0	269150	0	269150	1:0.74
	Total	2870600	-	1468085	1827400	150900	1978300	1:1.18
2021-22	South	6325500	-	4436900	1625550	263050	1888600	1:1.39
	North	669500	-	131800	537700	0	537700	1:0.24
	Total	6995000	-	4568700	2163250	263050	2426300	1:1.88

Note: Normal ore is of +45% Fe and Hematitic Siliceous ore is +35% Fe

Table- 38: Insitu Tentative Excavation- in Tonnes

Year	Block	Total tentative Excavation	Top Soil	OB/SB /IB	ROM-Iron Ore			Mineral Rejects	ROM/Waste Ratio
					Normal Ore	Hematitic Siliceous ore	Total		
1	2	3	4	5	6	7	8	9	10
2019-20*	South	677600	-	205700	471900	0	471900	-	1:0.44
2020-21	South	6586018	-	2495745	4674750	407430	5082180	-	1:0.49
	North	807450	-	0	807450	0	807450	-	-
	Total	7393468	-	2495745	5482200	407430	5889630	-	1:0.49
2021-22	South	13390883	-	7803998	4876650	710235	5586885	-	1:1.39
	North	224060	-	224060	1613100	0	1613100	-	1:0.14
	Total	13614943	-	8028058	6489750	710235	7199985	-	1:1.12

Note: Normal ore is of +45% Fe and Hematitic Siliceous ore is +35% Fe

*Production program for 2019-20 is ~0.472 MT as 4.427 MT of ore has already been produced upto Jan 31st 2020.

Dumpre-handling: (for recovery of mineral):

Table- 39:

Year	Dump Re-handling
2019-20	No proposals
2020-21	No proposals
2021-22	No proposals

c) Individual year wise development plans and sections:

A production of 0.472 MTPA has been planned for current year (2019-20) and 5.89 MTPA (CEC approved quantity) is proposed during 2020-21 and during 2021-22 production will be maintained at 7.2 MTPA as per previous approved modified Mining Plan.

Production and Development plan and sections are enclosed as Plates III/a to c. Individual year wise production /development details are given Annexure-22 and summary of the same is given below:

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Table- 40: Summary of Production / Development

Year	ROM-Iron Ore-Tonnes			Total waste (OB/SB+ BHQ + Rehandled waste)	ROM/ Waste Ratio
	Normal Ore +45% Fe	Hematitic Siliceous Ore +35% Fe	Total		
2019-20*	471,900	--	471,900	205,700	1: 0.44
2020-21	5,482,200	407,430	5,889,630	2,495,745	1: 0.49
2021-22	6,489,750	710,235	7,199,985	8,028,058	1: 1.12

The following table describes the working proposals year wise, block wise:

Table- 41: Year wise / block wise workings

Year	Block	Sections	Area in Ha	No. of benches	Level in mRL	Location	
						Northing	Easting
2019-2020	South	1 to 15	55.0	9	860-783	1571942	630873
						1573393	629639
2020-2021	South	1 to 15	56.12	20	898-777	1571942	630873
						1573393	629639
	North	16A to 20	5.70	5	940-905	1574254	629665
						1573581	629420
2021-2022	South	1 to 15	60.0	20	905-777	1571942	630873
						1573393	629639
	North	16A to 20	8.00	6	934-899	1574254	629665
						1573581	629420

During this plan period, total waste will be dumped on the existing dumps, D3 and D4 area. During 2019-20 dumping will be on D4 and start from 820mRL and continue up to 870mRL in five stages, with each stage (terrace) of height of 10m. During 2020-21, dumping will be both on D3 & D4 and start from 820mRL and continue up to 910mRL in nine stages of 10m each. During 2021-22, dumping will be on D3 and start from 820mRL and continue up to 930mRL in ten stages of 10m each. Dumps will be built up from the bottom of the existing dump in a retreating manner.

Table- 42: Proposed dumping details

Year	Dumps	Area In Ha	Qty MT	No. of stages	Level mRL	Dump slope	Location Co-ordinates	
							Northing	Easting
2019-20	D4	13.01	0.206	5	820-860	28°	1573497	630046

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2020-21	D3 &D4	22.73	2.496	6	850-910	28°	1572710	630713
							1573495	631211
							1572253	630645
2021-22	D3	23.00	8.028	10	820-920	28°	1572931	631211
							1572253	630503

The dumping proposals are given in Plates no.VI a and VI b.

d) Salient features of the proposed method of working:

It is proposed to operate the mine by fully mechanized open-cast mining method in two shifts (6am to 2pm and 2pm to 10pm). Mining will be carried out in both the blocks. The benches will be made with a height of 7m and width will be around 10m. The existing pit will be worked by advancing the benches across the strike direction.

The produced ore will be transported through 35 tons capacity dumpers to the Crushing/Screening plant to get the end products like calibrated lumps (+6mm-40mm) and fines (-10mm). These products will be stacked in designated areas. The waste will be dumped through dumpers systematically in SE part of the lease (D3/D4) where already waste dump is present. Existing infrastructure at mine site at south block consisting of mine office, canteen, workshop, parking yard etc. have been shifted towards footwall side.

The existing machinery are enough to handle the proposed production and development. Hence, no additional deployment of machinery is envisaged as Lessee is already having adequate machinery commensurate with the EC quantity.

Table: 43- Machinery Details

Sr. No	Equipment / Machinery	Manufacturer	No. of units	Engine HP	Capacity
I	Hydraulic	CAT 330	2	220	1.65cum
	Excavators	Volvo 460	1	316	2.45cum
	(Total 8 nos.)	Volvo 700	5	424	4.0cum



2	Wheel Loaders	CAT/Volvo	9	243	3.1 cum
3	Wagon drill	Atlas Capco	1	25	20m/hr
4	Ripper Dozer	D9R	3	42	Govt. of India
5	Dozer	D6R	1	199	35 tons
6	Dumpers	Volvo	35	405	
7	Crushing/Screening Plant with generator	Power Screen	4		1x1000 and 3x500tph
8	Water Tanker	TATA	4	130	8000 ltrs
9	Jeeps / Service Vehicles	Mahindra/Tata	7	70	

Calculation of adequacy of loading /hauling equipment:

Hydraulic excavators of varying capacity ranging from 1.65 cum to 4.0 cum are being used. A typical hourly capacity of an excavator assuming an average bucket capacity of 3.11 cum is calculated below.

$$\text{Hourly capacity of shovel} = (3600 \times BC \times Sf \times Ff \times Tf \times n) / Ct$$

BC = Bucket capacity = 3.11 cum

Sf = Swell factor = 0.8 Ff = Fill factor = 0.9

Tf = Tonnage Factor = 3

n = Efficiency = 0.8

Ct = Cycle time in seconds = 45

$$\text{TPH} = (3600 \times 3.11 \times 0.8 \times 0.9 \times 3 \times 0.8) / 45 = 430 \text{ tph}$$

Considering 357 working days x 13hrs/day (two shifts);

Yearly handling by one excavator = $430 \times 13 \times 357 = 1.96$ million tons/annum

So, for 8 excavators = $1.96 \times 8 = 15.96$ million tons/annum.

This is more than sufficient as total proposed handling is around 15.23million tons/annum. Wheel loaders will be used for leveling as well as handling ore at Crushing/screening plants.

Dumpers: Considering two shifts working with 13 effective working hours for 357 days in a year, dumper wise handling is given below:

For 35 tonners with effective average handling of 90tph;

(The dumpers will make three trips/hr, so it will carry $35 \times 3 = 105$ tph).

Yearly handling by one dumper = $105 \times 13 \times 357 = 0.487$ million tons/annum

So, for 30 dumpers = $32 \times 0.487 = 15.584$ million tons/annum.



Remaining 5 dumpers will be extra being used for secondary handling as well for transportation.

Transport system: The produced ore will be transported through 35 tons capacity dumpers inside the mine area to the Crushing/Screening plant to get the end products like calibrated lumps (+6mm-40mm) and fines (-10mm). The ore production will be dispatched by road as well as by rail.

Proposed Pipe Conveyor System: Currently, this mine has three exit routes namely Gate-1 (Mines to Sasalu railway siding), Gate -2 (Mines to BBH railway siding) and Gate-3 (Direct road via Bheemasamudra). However, lessee has proposal to establish a suitable Pipe Conveyor System within two years to avoid surface transport and help to reduce the environmental footprint substantially. The proposed system will have following key features:

- Total length of the conveyor including the tripper conveyor would be about 4.8km.
- Proposed to achieve a capacity of about 6 rakes/day.
- Designed for 330 days for conveyor and 12hrs per day considering operation during day light (6am to 6pm) with 24000 TPD, 2000 TPH.
- Two shifts conveyor operation and 3rd shift for maintenance.
- Reclaiming of material is proposed to be through Pay loaders.
- Project will be implemented in two phases.

Additional information: In case of rail, the iron ore (about 70-80%) will be transported from the mine to the Railway siding at BBH by own Volvo trucks of 35 tonnes capacity and to Sasalu through hired tippers of 10 tonnes capacity. At railway siding, ore will be loaded into railway wagons and transported up to the end user destination. About 20-30% of ore production will be directly transported by existing road network of mines to Bheemasamudra village road joining state highway and connecting to National Highway No.13.



Drilling & Blasting:

The formations are mostly soft and drilling blasting will be resorted only when hard strata are encountered. Only about 20% of material needs blasting. Holes of 7-8m will be drilled covering inclination and sub-grade drilling. Drill holes will have a spacing and burden of 3m and 4m respectively. Wagon drill and diesel driven compressors will be used for drilling.

Broad Blasting Parameters: Bench height & width shall be maintained at 7m and 10m respectively each for easy operation of machinery. Holes of 7 to 8m will be drilled covering inclination and sub-grade drilling. Drill holes in development shall have a spacing and burden of 3.0m and 4.0m respectively. Charge per hole will be kept at around 30kgs. Normally two rows of blasting pattern will be adopted to control the ground vibration, back break and noise pollution. Stemming of around 3m will be done to control the fly-rock generation. The maximum no of holes kept in one blasting round will be restricted as per the provisions of MMR. Use of MS delay detonators & cord relays will help in controlling the vibration and achieve better fragmentation. Yield will be around 2700 cum /round.

Blast initiation in the hole will be done using Nonel shock tube of 25Ms and 42Ms. The powder factor will be around 7.0 tons/kg as only hard strata will be blasted. Hence, the charge per hole will be around 25kg depending on the strata.

Type of explosives to be used: Slurry explosives

Storage of explosives: The Lessee will be hiring licensed Blasting contractors for blasting activity in the mine

Adequacy of drill machines: For a quantity of 14.4 lakhs TPA (20% of 7.2 MTPA) that is 4800tpd, with an output of 37.8 tonnes/m of drilling, one wagon



drill machine is enough as it can drill 20m/hr. (4800/37.8 = 127m / day). Hence it can drill 127m in six to seven hours.

e) Layout of mineworkings:

The proposed method of working will be opencast fully mechanized, by forming benches of 7m height and width of >8m. The benches will be advanced in the direction of south & west in south block, whereas towards east in north block. Some of the dumps will also be re-handled during pit movement. Haul road has 12-16 m width and average gradient of 1 in 16 to 1 in 20 gradients except in short ramps. The face slope will be around 80° and overall pit slope will be maintained at <40°.

Table- 44: Year wise / block wise working details

Year	Block	Sections	Area in Ha	No. of benches	Level in mRL	Location	
						Northing	Easting
2019-2020	South	1 to 15	55.0	9	860-783	1571942	630873
						1573393	629639
2020-2021	South	1 to 15	56.12	20	898-777	1571942	630873
						1573393	629639
	North	16A to 20	5.70	5	940-905	1574254	629665
						1573581	629420
2021-2022	South	1 to 15	60.0	20	905-777	1571942	630873
						1573393	629639
	North	16A to 20	8.00	6	934-899	1574254	629665
						1573581	629420

Table- 45: Proposed dumping details

Year	Dumps	Area in Ha	Qty MT	No. of stages	Level mRL	Dump slope	Location Co-ordinates	
							Northing	Easting
2019-20	D4	13.01	0.206	5	820-860	28°	1573497	630046
							1572710	630713
2020-21	D3 & D4	22.73	2.496	6	850-910	28°	1573497	631211
							1572253	630046
2021-22	D3	23.00	8.028	10	820-920	28°	1572931	631211
							1572253	630503

The dumping proposals are given in Plates no. VI a and VI b. Location of proposed workings and dumping are shown in the production layout plans plate III/a to c. The working section is enclosed as III/b and Conceptual dump management plan is shown in Plate no. VIb.



f) Conceptual Mine Planning:

Excavation: In the entire lease area, about 99.16 ha area is mineralized. Considering the current exploration data and geology, pit layout is designed. The mining will be carried out in the already opened pits. Bench height will be 7m and width will be >8m. Overall slope angle will be maintained at <40°. The final pit limit is designed based on the depth, average dip and width of the ore body.

The mineable reserves estimated are 128.806 million tons and with the proposed production of 7.20 million TPA, the life of mine will be around 17.89 years. The parameters of ultimate pit limit will be as follows:

Table-46: UPL Parameters

Block/ Pit	Pit Area ha	Pit Dimension			
		Length	Width	Max. Depth	Slope
North	27.00	490m	551m	200m	35° (FW)
South	72.16	1410m	512m	195m	35° (HW)

The ultimate pit limit and ultimate pit slope is demarcated on the Geological Plan and Cross Sections and enclosed as Plates II b and c.

The mining lease is getting expired on 28.10.2032. The land use has been demarcated based on the production limits fixed by CEC. The mining will be done up to lease period. The mining area will be extended from 77.99 ha in this plan period to 99.16 ha during conceptual stage. Based on current exploration the ultimate pit limit will be extended over the stabilized dumps D1 & D2 in western part, the surface dumping in D3 and D4 will be done in this plan period and further waste will be back filled in the worked-out pit. The details of backfilling area and its capacity has been given in next section and shown in the Conceptual dump sections, plate no. VI/b. Necessary land use required for other allied works has been demarcated in the conceptual plan plate no. VI/a.



Recovery of ROM: Recovery is considered as 100% for iron ore and as no intercalations are present in ore zone. (Annexure-19). Hematitic siliceous ore is also having a recovery of 100% wrt both +10mm Cal ore and -10mm fines.

Disposal of Waste:

During this plan period, waste will be dumped in D3 and D4. In total D3 & D4 (with extension) dumping put together is having about 37.20 ha area and can accommodate about 15.79 million tons of waste and this area is enough for surface dumping as waste generation in three years plan period is 10.73 million tonnes. Waste generated for the life of the mine will be 86.358 million tonnes.

Backfilling of voids: No proposals of backfilling in this plan period. But during this plan period workings will be carried out in south block between sections 8-8' to 14A-14A' to exhaust ore present there, which will generate space to accommodate about 51.804 million tons of waste as backfilling. Back filling will start only after exhausting this belly portion of pit. Care will be taken to develop the both the eastern and the western side of the pit by orienting the excavation straight and excavation will be widened at the bottom so that the bottom mRL will remain same throughout both the sides of the pit. This will make the pit suitable for backfilling of waste by exhausting the ore at the bottom. So, in conceptual plan period mining will be with concurrent backfilling.

Table- 47: Conceptual dumping and backfilling program

Dumping:

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Year	Dumps	Area In Ha	Qty MT	No. of stages	Level mRL	Dump slope	Location Co-ordinates	
							Northing	Easting
2019-20	D4	13.01	0.206	5	820-860	28°	1573497	630046
							1572710	630713
2020-21	D3 & D4	22.73	2.496	6	850-910	28°	1573497	631211
							1572253	630046
2021-22	D3	23.00	8.028	10	820-920	28°	1572931	631211
							1572253	630503

Backfilling:

Stages	South Block	Sections	Capacity in MMT	Location Co-ordinates	
				Northing	Easting
1 st stage (2022-27)	21.69ha	8-8' to 12A-12A'	29.665	1572420- 1573400	629800- 630500
2 nd stage (2027-32)	11.79 ha	13-13' to 14A-14A'	22.139	1572860- 1573360	629630- 630110

Reclamation and Rehabilitation:

Protective measures proposed in the R&R plan has already been carried out.
The details are given below:

Table-48:

Description	Proposed	Work done
Retaining walls at toe of waste dump		
(i) R-R dry stone masonry (D1 +D2 +D3 + D4)	34040 m ³	34040 m ³ / annum
(ii) C-C 1:4:8 in foundation (D1 +D2 +D3 + D4)	1684.99 m ³	1684.99 m ³ / annum
Garland drain (1 m bottom width, 2 m top width and 1 m deep in all terraces) for D1+ D2+ D3 + D4	8376 m ³	8376 m ³ / annum
	8076 m ³	8076 m ³ / annum
Garland drain (1 m bottom width, 2 m top width and 1 m deep in inclined chutes) for D3 + D4	180 m ³	180 m ³ / annum
	180 m ³	180 m ³ / annum
Retaining walls at intermediate locations of waste dump		
(i) R-R dry stone masonry (D3 + D4)	8131.5 m ³	8131.5 m ³ / annum
(ii) C-C 1:4:8 in foundation (D3 + D4)	623.42 m ³	623.42 m ³ / annum
Construction of chute at the gully for D2		
(i) CC 1:3:6 in foundation	55.8 m ³	55.8 m ³ / annum
(ii) R.R stone masonry in cement mortar 1:5 in side walls	90.0 m ³	90.0 m ³ / annum
(iii) R.R stone masonry in bed of the drain	27.0 m ³	27.0 m ³ / annum
(iv) Stone pitching on both banks	339.0 m ³	339.0 m ³ / annum
Construction of sump and drop walls for D2		
(i) CC 1:3:6 in foundation of the sump	31.98 m ³	31.98 m ³ / annum
(ii) R.R 1:5 in walls of the sump	25.00 m ³	25.00 m ³ / annum
(iii) R.R 1:5 in front wall	45.00 m ³	45.00 m ³ / annum
(iv) R.R. 1:6 in drop walls	18.75 m ³	18.75 m ³ / annum
(v) CC 1:3:6 in foundation of the drop wall	24.18 m ³	24.18 m ³ / annum
Additional R&R works :		
Construction of retention wall – D3 dump	409m	409m



No pending works of R&R, however, Engineering structures like toe wall and garland drains are proposed at the bottom of dumps to prevent wash off from dumps into adjacent areas. These are marked, and details are given in Conceptual dump management plan, plate no. VI/a.

Table- 49: Year wise Engineering measures

Year	2020-2021	2021-2022
Retention wall	-	Maintenance of existing structures
Garland drain	2 nos. (70m, 175m)	Maintenance of existing structures

Afforestation: To minimize the impact of mining on environmental components outside the mine lease area, greenbelt zone of 5.03 ha along the lease boundary with 7.5m width is already established as safety zone inside mine lease area this will be maintained.

Table-50: Year wise Plantation on the slope of South Block dump

Table-3.7: Year wise Plantation on the slope of South Block dump						
Year	Area (ha)	No. Saplings	Survival Rate	Species	UTM Co-ordinates	
					Northing	Easting
2020-21	1.20	3000	70-80%	As per R&R recommendations	1572626	630857
					1572774	631064
2021-22	0.60	1500			1572735	630716
					1572875	630906

Table -51: Land Use Pattern

Type	Existing Area (Ha)	Plan period Area (Ha)	Conceptual period Area (Ha.)
Mining	69.04	77.99 *	99.16**
Active dump area	43.10	45.40**	45.40
Stabilized dump area	23.24	20.94	6.54
Mineral stock	10.89	06.77 #	06.77
Statutory building	02.80	00.50 ^	00.50
Crushing/Screening /stock	04.60	03.18 ^S	03.18 ^S
Road	01.89	00.78	00.78
Safety zone (7.5m)	05.03	05.03	05.03
Total	160.59	160.59	160.59

Note:

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*Mining: 77.99 Ha (Existing pit 67.04 ha + 1.12 ha from crushing & screening + 1.11 ha from rock)
 **Active Dump: 45.40 ha (Existing 43.10 ha + 2.30 ha from Statutory building area)
 *Mineral stock: 6.77 ha (Existing 10.89 ha - 4.12 ha for mining)
 Temporary statutory building: 0.5 ha (1.5 ha of 2.5 ha area for crushing & screening area 3.17 ha (Existing 4.60 ha - 1.42 ha for mining))

Conceptual period are breakup details:

Stabilized dumps area reducing from 23.24 ha to 6.54 ha in the conceptual stage as mining area will move into stabilized waste dump

Mining 99.16 Ha. (plan period area 77.99 + 14.40 ha from Stabilized waste dump + 6.77 ha from mineral stock)



3.0 MINEDRAINAGE

a) Minimum and maximum depth of water table based on observations from nearby wells and water bodies:

The water table near the mine varies from 30m to 50m bgl that is about 600 above MSL as per the bore wells drilled nearby.

b) Maximum and minimum depth of workings:

The mine is located on hilly range with highest elevation ranging from 807 above MSL and 960 above MSL respectively. The ultimate depth of the mining will be 560 above MSL.

c) Quantity and quality of water likely to be encountered, the pumping arrangements and places where the mine water is finally discharged:

No ground water will be encountered during mining as the lowest level in mining will be well above general ground level. The monsoon water runoff gets drained off through the natural valleys.

d) Regional and local drainage pattern:

The average annual rainfall in the mine site is 700mm. July happens to be the month with the heaviest rainfall is 167.7mm average during the period 2001 to 2015. No Rainwater will be collected within the pit as most of it will be infiltrated into the ground. Monsoon water falling on slopes and other areas will be coursed through the existing natural valleys which are provided with check dams and gully checks. These will help in arresting solid wash off from the mining area. Ground water will not be encountered during this plan period as well as in conceptual period.

4.0 STACKING OF MINERAL REJECT/SUBGRADE MATERIAL AND DISPOSAL OF WASTE

- a) Nature and quantity of topsoil, overburden/waste and Mineral Reject to be disposed off:



Topsoil: As this mine is working since 1954, entire mining lease area is broken and open hence no topsoil will be generated.

Waste Rocks: Overburden ferruginous shale/phyllitic clays, quartzite (siliceous waste), weathered dyke etc are the waste materials to be handled during mining. The physical characteristics of wastes are;

Phyllitic clay: Fine grained soft material with pinkish to yellowish in colour.

Quartzite (siliceous waste): Its mainly weathered BHQ having fine grains and it is friable material, whitish in colour.

Weathered dyke: Its mainly weathered basic dyke having fine grains and it is friable material which is pinkish in colour.

BHQ: This banded iron formation is hard to medium hard in nature and at places the quartzite band is converted to shale/phyllite. This may be called shaly BHQ.

Table -52: Year wise Quantity of waste and others in tonnes

Year	Topsoil		Waste		Mineral rejects	
	Reuse / Spreading	Storage	Backfilling	Storage	Storage	Beneficiation
2019-20	-	-	-	205,700	-	-
2020-21	-	-	-	2,495,873	-	-
2021-22	-	-	-	8,028,058	-	-

b) Dumping area:

Currently the mine area has four dumps, the details of each dump are;

Table – 53: Existing dump details

Dump	Extent (ha)	Qty- MT	Stages	Location	Level MSL	Remarks
D1	17.49	6.208	6	N1574087-15733392 E629530-629021	930-816	Partly stabilized and afforested over an area of 23.24 ha
D2	5.75	7.710	1	N1572533-1571853 E630211-630503	863-801	
D3	22.56	12.778	7	N1572931-1572253 E630490-631178	913-816	Active dumps
D4	20.54	0.096	7	N1573497-1572710 E630046-630713	893-820	

Proposed dumping:

During this plan period 10.73 million tonnes of waste is proposed to be generated and this waste will be dumped on D3 and D4, which are already on non-mineralized area and outside the UPL. The proposed dumping area over D3 & D4 is about 37.20 ha in extent and can accommodate about 15.79 million tons of waste. This has been estimated considering the number of stages, slopes and haul road width etc. (The design details are given in Plate VIb). This area is enough for surface dumping as waste generation in three years plan period is 10.73 million tonnes only.

Table- 54: Proposed dumping details

Year	Dumps	Area In Ha	Qty MT	No. of stages	Level mRL	Dump slope	Location Co-ordinates	
							Northing	Easting
2019-20	D4	13.01	0.206	5	820-860	28 ⁰	1573497	630046
							1572710	630713
2020-21	D3 & D4	22.73	2.496	6	850-910	28 ⁰	1573497	631211
							1572253	630046
2021-22	D3	23.00	8.028	10	820-920	28 ⁰	1572931	631211
							1572253	630503



c) **Manner of disposal and configuration, sequence of build up of dumps along with the proposal of stacking of sub grade ore:**

During this plan period the waste will be dumped on D3 and D4 dump. During 2019-20 dumping will be on D4 and start from 820mRL and continue up to 870mRL in five stages, with each stage (terrace) of height of 10m. During 2020-21, dumping will be both on D3 & D4 and start from 820mRL and continue up to 910mRL in nine stages of 10m each. During 2021-22, dumping will be on D3 and start from 820mRL and continue up to 930mRL in ten stages of 10m each. Dumps will be built up from the bottom of the existing dump in a retreating manner.

No pending works of R&R, however, all required measures as per requirement of R&R plan, like engineering structures like toe wall and garland drains are proposed at the bottom of dumps to prevent wash off from dumps into adjacent areas. These are marked, and details are given in Conceptual dump management plan, plate no. VI/a.

Table- 55 : Year wise Engineering measures

Year	2020-2021	2021-2022
Retention wall	-	Maintenance of existing structures
Garland drain	2 nos. (70m, 175m)	Maintenance of existing structures
Location	At the bottom of D3 and D4	

Mineral Rejects / Sub-grade: No Mineral rejects / subgrade is proposed to be produced. All ROM of +45% Fe grade of this mine is saleable. Currently the mine is having around 8.42 lakh tonnes of incidental Hematitessiliceous ore of 35 to 45% Fe is already stacked over D1. Further generation of Hematitessiliceous ore in this plan period will be also be temporarily stacked over D1. This will be blended with ROM as and when required.



5.0 USE OF MINERAL AND MINERAL REJECT

a) Requirement of end-use industry:

The Iron ore produced in the lease will be supplied to local steel / pig iron / sponge iron / pellet / sinter plants. The buyers are procuring ore (fines and calibrated ore) of +45% Fe grade. Hematitic siliceous ore (+35% Fe) will be dry screened and +10mm Cal ore will be sold directly as +45% and -10mm fines will be blended with high grade ore fines and marketed to major steel producers like JSW as it will result in better quality wrt Mn, Alumina & Phosphorus content.

The quality of ore with respect to Fe% required to make it suitable for marketing will be arrived after proper blending of normal and siliceous ore. The details of the blending ratio for all types of ore is given below:

Table- 56 : Blending Plan

Year	Item	Normal Ore			Siliceous Ore			Sub Total		Total Product
		Fines	Lumps	Product	Fines	Lumps	Product	Fines	Lumps	
2019-20	Tonnes	377,520	94,380	471,900	--	--	--	377,520	94,380	471,900
	Fe%	57.80	60.30	58.30	--	--	--	57.80	60.30	58.30
2020-21	Tonnes	4,385,760	1,096,440	5,482,200	264,830	142,601	407,430	4,650,590	1,239,041	5,889,630
	Fe%	59.00	61.50	59.50	35.05	58.05	43.10	57.64	61.10	58.37
2020-21	Tonnes	5,191,800	1,297,950	6,489,750	461,653	248,582	710,235	5,653,453	1,546,532	7,199,985
	Fe%	58.15	60.36	58.59	35.69	58.69	43.74	56.32	60.09	57.13

b) Requirement of intermediate industries involved in up-gradation of mineral before its end-use:

No involvement of any intermediate industries before its end use. The proposed ore production in this Mining Plan will be maintained above 45% Fe, occasionally by blending fines (-10mm) of Hematitic siliceous ore (+35% Fe) after dry

screening with high grade ore. +45% Fe material is being used for direct use in steel industries.

- c) **Detail requirements for other industries, captive consumption, exports, Associated industrial use etc.**

No such use is envisaged now, as all ore produced is expected to be consumed directly in local steel industries. However, the ore can be exported to international steel mills after ban on export is vacated by Govt.

- d) **Physical and chemical specification stipulated by buyers:**

Iron ore are sold to steel plants through e-auction. Physical and chemical specifications stipulated by buyers are:

Table -57:

Buyer	Category	Grade	Use
Pig Iron Division of Vedanta Ltd and others like- JSW/ BMM, Prakash Sponge etc.	Cal. Ore of -40+6 mm	Fe 54-62% Mn <2.7% MnO <3.3% Al ₂ O ₃ <2%	Pig Iron/Sponge for Steel Production
JSW/BMM etc.	Fines of -10mm	Fe 50-60% Mn <2.7% MnO <3.3% Al ₂ O ₃ <2%	Sinter plant/ pellets and others.

- e) **Detail of processes adopted to upgrade the ROM to suit the user requirements:**

Dry processing of ROM (screening) into different sizes like +6-40mm calibrated lumps and -10mm fines. Hematitic siliceous ore (35 to 45% Fe) will

be dry screened and lumps/fines will be blended with high grade ore and sold as and when required.





6.0 PROCESSING OF ROM AND MINERAL REJECT

a) Processing/ beneficiation of the ROM or Mineral Reject:

The mined ROM is crushed and screened in the existing dry processing plants for size separation as per buyer's requirement. These will be used to treat Hematitic siliceous ore (35 to 45% Fe) also and lumps/fines will be blended with high grade ore, as and when required.

b) Flowsheet or schematic diagram of the processing procedure:

Ore produced from the mine is segregated in four crushing/screening plants (1x1000tph and 3x500tph) to bifurcate ore according to size gradation. ROM is fed to either fixed/mobile plant. The material in fixed plant is directly fed to the vibro grizzly (screen) and +70mm & -70mm will be separated. The separated +70mm material is sent to primary jaw crusher (36" x 20") where it is crushed and sent to primary screen. The separated -70 mm material from vibro grizzly is sent to primary screen where the material gets separated into 10mm, 10 to 40mm and +40mm. The -10mm material is directly sent to product bunker. The +10 -40mm material is sent to the secondary screen. The material of +40mm is sent to cone crusher where it gets crushed and is sent to secondary screen where it separates materials into 10mm, 10 to 40mm lumps. So, the materials of -10 fines and 10 to 40 mm lumps are stacked separately. The whole process is involved in a single closed system and 100% material is recovered.

Typical flow sheet of Crushing / screening plants is given in Annexure-24.



c) Disposal method for tailings or reject from the processing plant:

No tailings or rejects from plant. Not applicable.

d) Quantity and quality of tailings/reject proposed to be disposed:

No tailings or rejects from plant. Not applicable.

e) Quantity and type of chemicals if any to be used in the processing plant:

No chemicals are used.

f) Specify quantity and type of chemicals to be stored on site/plant:

Not applicable.

g) Water requirement:

No wet processing is proposed only size bifurcation by simple crushing and screening. Water requirement is only for dust suppression in plant and mining area, where about 554 cum/day of water will be used which sourced from the bore well located outside lease area.



7.0 OTHERS

a. Site services:

Repairs of equipment will be undertaken at workshop located at mine site or the major repair or overhauling of the equipment will be done at workshop located near administrative building. Well-equipped administrative office, Stores, First-aid station, rest shelter, canteen, latrines and urinals are available at the mines. Two water treatment plants are located at mine site canteen and near administrative office.

b. Employment potential:

Table -58 :

Category	Nos.
Managerial	67
Highly Skilled	111
Skilled	67
Semi-Skilled	27
Un-Skilled	10
Total	282

Table - 59: Details of Employment

Type	Nos.
Sr. Management (AVP, GM, AGM)	7
Geologist	2
Mines Manager/Mining Engineer	1
Asst. Managers/Mining Engineers	15
Engineers	15
Chemist	1
Officers	24
Trainees	2
<i>Sub Total</i>	<i>67</i>
Workers	215
Total	282



8.0 PROGRESSIVE MINE CLOSURE PLAN UNDER RULE 23 OF MCDR'2017

8.1 Environment Base line information:

Table-60: Existing land use pattern:

Type	Existing Area (Ha)
Mining	69.04
Active dump area	43.10
Stabilized dump area	23.24
Mineral stock	10.89
Statutory building	02.80
Crushing/Screening Area/stock	04.60
Road	01.89
Safety zone (7.5m)	05.03
Total	160.59

Water regime:

The mine area receives average amount of rainfall of about 904mm annually. Mines are located in hilltops and the present mine level is much higher level than the water table of the region. The ultimate depth of mining will be 620 m above MSL and ground water table is at around 600m above MSL. Hence, the mining activities will not intersect ground water table even at conceptual stage.

Quality of air:

Recent data generated by the Lessee was considered to assess AAQ status for the study area. The maximum and minimum concentration for PM₁₀ in the buffer zone are well within the prescribed limits. The concentration of SO₂ and NO_x were also within the annual average limits of 80 µg /cum. (PI see Annexure-25 for details).



AAQ data was collected for six stations in the mining lease area and analyzed for PM₁₀ and PM_{2.5} fractions. The concentration for PM₁₀ and PM_{2.5} are well within the prescribed limits. The concentration of SO_x and NO_x were also within the annual average limits of 80 µg /cum. (Pl see Annexure-25 for details).

Ambient noise level:

The noise level data recorded for buffer zone varies from 36.2 to 64.5 dB(A) Leq. and in core zone it varies from 44.2 to 8.6 dB(A) Leq. (Pl see Annexure-25 for details).

Flora:

Core zone:

Almost all the area is broken and being used for mining activities. Only the plantation that was developed by Lessee is the floral population consisting of mainly of Bamboo, Amla, Acacia, Cassia cemia, Cassia fistula, Pongamiapinnata, Jamun, Mango, Tamarind, Gulmohar, Eucalyptus, Neem, Ficus etc.

Buffer zone:

According to the Classification of forest types of India proposed by Champion and Seth (1968) the vegetation occurring in the area belongs to Southern tropical dry deciduous forests, the area falls under the mixed deciduous sub classification. According to the classification proposed by Legris and Pascal (1982) area falls under Deciduous climax forests. According to this classification this type of forests does not have the potentiality of secondary moist deciduous forests. The canopy is open and the majority of the trees are leafless during the dry months. The flowering and fruiting are generally far

advanced before the first flush of new leaves appears with the showers in April – May.



The dominant tree species found in the area are *Buchanania latifolia*, *Anogeissus latifolia*, *Wrightia tomentosa*, *Grewia orbiculata*. Few climbers and twiners like *Celastrus paniculata*, *Cocculus hirsutus*, *Aristolochia indica*, *Asparagus racemosus* are also observed. Shrubs like *Calotropis procera*, *Calotropis gigantea*, *Cassia auriculata*, *Tecoma stans*, *Dodonaea viscosa*, *Gardenia gummiifera*, *Clerodendrum serratum* etc., are a part of this type of vegetation. The dominant grasses include species like *Andropogon pumilus*, *Apludamutica*, *Brachiaria eruciformis*, *Chrysopogon fulvus*, *Cymbopogon martini*, *Cynodon dactylon*, *Heteropogon contortus* etc., The ground flora is chiefly seasonal. Some of the herbs growing in this area are *Acalypha indica*, *biternata* etc. *Dendrophthoe falcata* and few other species of *Loranthaceae* grow as parasites on tree branches.

Climatic conditions:

The climate of Chitradurga district, which is in the south-west part of the Deccan plateau, is marked by hot summer months, low rainfall and a pleasant winter season. The temperature is around 14° to 17°C during November and December months and goes up to 40° to 41 °C during April and May months of the year. The monsoon season extends over a period of six months from June to November. The district receives almost an equal amount of rainfall during the South-west monsoon (June to September) and during the North-east monsoon period (October to November). The average annual rainfall in the district is 580 mm with an average of 40 rainy days. The average annual rainfall in the mine site is 700 mm. The relative humidity is high during the monsoon ranging between 70% to 75% and remains low in the rest of the year, particularly in the summer months. Winds are generally moderate during summer and strong during rainy season. In the South-west monsoon period the winds blow mainly



from a south-westerly or westerly direction. In the rest of the year the winds are predominantly from directions between north-east and south-east.

Humansettlements:

There are no villages and habitation within the lease area. Workmen and staff will come from the villages outside the leasehold. So, there is no displacement involved. In the buffer zone about 36 villages are present with a total population of 50,868. The population details of villages in the buffer zone along with distance from the mine and direction is given below:

Table-61:

Village	Population	Dist& Direction	Village	Population	Dist& Direction
Alagavadi	1939	9023m - NE	Jammenahalli	614	5986m - NW
Arabagatta	540	5525m - NE	Kadleguddu	1496	4163m - NE
B.Durga	2193	9878m - SW	Kagalagere	699	8439m - NW
Bheemasamudra	1273	5543m - SE	Kallavvanagathihalli	990	8383m - SW
Bommenahalli	2718	5840m - SE	Kariyannanahalli	306	9462m - NE
Chikkaguntanur	168	9147m - SE	Kodagavalli	1136	8834m - NE
Doddiganahal	1112	4251m - NW	Konanur	643	3790 m - NE
Dyamavvanahalli	6495	7443m - NE	Lingavvanagathihalli	400	9601m - N
Ganjigatte	1083	9995m -NW	Medakeripura	3172	3728m - NW
Gollarahalli	1503	8371m - NW	Megalahalli	812	926 m- NE
Gowrammanahalli	960	7602m - E	Muthugaduru	1648	9986m - W
Gyarehalli	507	7633m - NE	Obavvanagathihalli	1163	7141m - NE
Halerangapura	1031	8526m- NW	Palakihalli	1380	7268m - NW
Hanumanakatte	281	8820m - NE	Palya	1459	5412m - SE
Hireguntanur	2656	4537 m - SW	Siddapura	594	4665m - NW
Hosahalli	1416	5397m - NW	Siddavvanahalli	1399	6720 m - NE
Hosarangapura	341	7154m - NW	Sirigere	4421	6132m - N
Hunasekatte	1252	7434m - NE	Udogere	1068	8756m - NW



Public buildings, places of worship and monuments: There are no public buildings, places of worship or monuments are located near the lease area.

Any sanctuary located in the vicinity of leasehold: There is no sanctuary located near the lease area.

Table-62: Year wise Plantation on the slope of South Block dump

Year	Area (ha)	No. Saplings	Survival Rate	Species	UTM Co-ordinates	
					Northing	Easting
2020-21	1.20	3000	70-80%	As per R&R recommendations	1572626	630857
					1572774	631064
2021-22	0.60	1500			1572735	630716
					1572875	630906

8.2 Impact Assessment:

i) Land area indicating the area likely to be degraded due to quarrying, dumping, roads, workshop, processing plant, tailing pond/dam, township etc.

The mining pits are present in the lease area serving as production benches. The major impacts observed include soil erosion, loss of topsoil, creation of pits and deforestation and possibility of adding silt load in the natural nallah nearby the lease area.

ii) Air quality:

The semi-arid climatic condition of the area coupled with mining activities on the top of the hills through open-cast, contributes to air pollution. The dust is observed to be the predominant air pollutant when the mining is in operation. Fugitive dust generation is controlled by spraying the water on the haulage road, Loading Point and Transportation routes. Green belt is developed all along the lease boundary and tall growing saplings have planted all along the road side which acts as wind barrier. All the transportation trucks carrying ore are covered with Tarpaulin and the same instructions in local language is displayed near security point for all the transportation truck drivers. Dust Suppression system is also installed at dry screening plant. Ambient Air Quality monitoring is carried out twice a week in core zone as well as in buffer zone for

confirming the permissible limits of the pollutants, Proposed monitoring stations are;

Table-63:

Station code	Location
A1	Mining Pit (South block)
A2	Crushing Point (South block)
A3	Dumping Area (South block)
A4	Haulage Road (South block)
A5	Ore Stack Yard (South block)
A6	Mining Pit (North Block)
A7	Haulage Road(North Block)
A8	Megalahalli Village



iii) Water quality:

The major impact on water pollution is due to erosion of waste dump and sub-grade dump, oil and grease, contamination of water bodies due to discharge of mine water/effluent and sedimentation of the seasonal nallahs flowing nearby. There is zero discharge of wastewater from the Mining lease. During monsoon the runoff water is collected in the settling pond and only the overflow water is allowed to go in the natural stream after passing through series of settling ponds and check dams. The natural stream water is collected in the village tank for public usage which is regularly monitored. All the waste dumps are covered with Geo textile and plantation is carried out on finalized dump slope. All the Waste dumps are protected with Retaining wall and Garland drainage. Oil & grease traps are provided at workshop where the oil is separated from water and is reused. Water Quality monitoring is carried out for confirming the permissible limits of the pollutants. Proposed monitoring stations are;

Table-64:

Station Code	Location
SW1	Settling Pond SPF-2 (SW of LBC-10)
SW2	Settling Pond SPR-5 (NE of LBC-2)
SW3	Settling Pond SPR-1 (NE of LBC-15)
SW4	Settling Pond SPR-3 (Water discharge point)

SW5	150m SE of LBC-12 (Water discharge Point)
W1	Megalahalli Tube well



iv) Noise levels:

Noise pollution by mining activities is mainly because of excavation, handling and transportation of ore and overburden and operation of processing equipment. All the DG sets in the mining area are provided with acoustic enclosures. The Staff working in noise area is provided with ear plugs & ear muffs. All the mining machineries have air-conditioned cabins which provides noise and dust free environment to the operator. Noise Quality monitoring is carried out for confirming the permissible limits of the pollutants. Proposed monitoring stations are;

Table-65:

Station code	Location
N1	South Block
N2	North Block
N3	Megalahalli Village

v) Vibration levels (due to blasting):

Very little drilling and blasting activities are proposed and hence no major impact from drilling / blasting.

vi) Water regime:

There is no seepage water and there is no water table in the vicinity as the lowest level in mining will be well above the ground level. Monsoon water gets drained through seasonal nallahs joins nearby tank.

vii) Acid mine drainage:

Not applicable as no acidic material is present in the mining area.

viii) Surfacesubsidence:

Not applicable as it is opencast mining in a fairly stable area

vii) Socio-economics:

The mining will bring positive effect by way of generation of employment and business opportunities to local people. Apart from this Lessee will undertake CSR activities focusing on measures to improve education, health, literacy of the people of surrounding villages.

viii) Historicalmonumentsetc.

There are no public buildings, places of worship or monuments are located near the lease area.

Table – 66: Sources of Pollution and Mitigation measures

Item	Source	Existing	Proposed
Air	The semi-arid climatic condition of the area coupled with mining activities on the top of the hills through open-cast mining	Water spraying the water on the haulage road, Loading Point and Transportation routes. All the transportation trucks carrying ore are covered with Tarpaulin. Dust Suppression system is also installed at dry screening plant.	Same measures will be continued
Water	Erosion of waste dump and sub-grade dump, oil and grease, contamination of water bodies due to discharge of mine water/effluent	Zero discharge of waste water from Mining lease. Rain water is collected in the settling pond and only the overflow water is allowed to go in the natural stream after passing through series of settling ponds and check dams. All the waste dumps are covered with Geo textile and plantation is carried out on finalized dump slope. All the Waste dumps are protected with Retaining wall and Garland drainage. Oil & grease traps are provided at workshop where the oil is separated from water and is reused.	Same measures will be continued
Noise	Mining activities like excavation,	The Staff working in noise area is provided with ear plugs & ear	

	handling and transportation of ore and overburden and operation of processing equipment and DG sets.	muffs. All the mining machineries have air-conditioned cabins which provides noise and dust free environment to the operator. All the DG sets in the mining area are provided with acoustic enclosures.
--	--	---



8.3 Progressive reclamation Plan:

8.3.1. Mined-out Land:

No mined-out land is proposed to be generated in this plan period. In next plan periods, it is proposed to take up backfilling in the mined-out pits.

8.3.2 Topsoil Management:

The mine is working since 1954 and entire area is broken, and it does not have any topsoil.

8.3.3 Tailings Dam Management:

No proposals as no tailing dam is present or proposed.

8.3.4 Acid mine drainage, if any and its mitigative measures:

Not applicable as no acidic material is present in the mining area.

8.3.5 Surface subsidence mitigation measures:

Not applicable as the proposal is for opencast mining in a fairly stable area.

Table-67: Summary of year wise proposal for item No. 8

Items	Details	Actual Position (as on 01.02.2020)	Proposals			Remarks
			2019-2020	2020-2021	2021-2022	
Dump management	Area afforested	23.24 ha	--	1.20 ha	0.60 ha	
	No of saplings planted	27,000	--	3000	1500	-
	Cumulative no. of plants	404,508	--	407508	409008	-
	Cost including watch and care during the year	Rs. 68,713/-	-	Rs.3.0 lakhs	Rs.1.5 lakhs	-
Management of worked out benches	Area available for rehabilitation (ha)	--	-	-	-	-
	Afforestation done (ha)	--	-	-	-	-
	No of saplings planted	--	-	-	-	-
	Cumulative no of plants	--	-	-	-	-
	Any other method of rehabilitation (specify)	--	-	-	-	-
	Cost including watch and care during the year	--	-	-	-	-
Reclamation and Rehabilitation by backfilling	Void available for Backfilling – in ha	--	-	-	-	-
	Void filled by waste/tailings	--	-	-	-	-
	Afforestation on the backfilled area	--	-	-	-	-
	Rehabilitation by making water reservoir	--	-	-	-	-
	Any other means (specify)	--	-	-	-	-
Rehabilitation of waste land within lease	Area available (ha)	--	-	-	-	-
	Area rehabilitated	--	-	-	-	-
	Method of rehabilitation	--	-	-	-	-
Others (specify)*	Green belt/ Avenue plantation	-	-	-	-	-
	Env. monitoring	Will be carried out as proposed				

* Note: The various R & R works which are completed have been mentioned in Para 2(f) in tabular form.



8.4 Disaster Management and Risk Assessment:

No high-risk accidents are anticipated, as the project is an open cast mining operation in a stable area free from land subsidence, earthquake etc. No tailing dam is proposed, and risks associated with it will not come into picture. However, in case anything happens then the designated Mines Manager & Safety officer will be managing the situation. He will be having communication facility and a Jeep at his disposal which will help in evacuating persons involved in any accidents. Chitradurga is the nearest place (30km) where Hospital, Police Station etc are available. However, the Mines Manager and Safety Officer will co-ordinate the activities in case any disaster happens.

The details of Mines Manager are:

Name: Mr. Vijayanand Chakrasali,

Ph. : 08194 238110 Mobile : 9481815010

8.5 Care and maintenance during temporary discontinuance:

During such time, the area will be closed at gates and temporary staff will be arranged for care and maintenance.

8.6 Financial Assurance:

The total area utilization at the end of this plan period will be 160.59 Ha. So, financial assurance will be Rs. 481.77 lakhs @Rs. 3.0 lakhs per ha. However, a Bank Guarantee for this amount has already been submitted to RCoM, Bangalore. (Copy enclosed as Annexure-26).



vedanta
transforming elements

Vedanta Limited
Mining Lease No. 2677

MODIFICATION TO THE APPROVED
REVIEW & UPDATES OF MINING PLAN



Table -68: Areas for Financial Assurance as per CCOM's Circular no. 4, 2006

Sl No.	Type of Land Use	Area of land use (in ha)			The area (in ha) considered as fully reclaimed & rehabilitated	Net area that considered for calculation of financial assurance
		Area put on use at start of plan	Additional requirement during plan period	As at the end of Plan period		
	1	2	3	4	5	6
1	Area under mining	69.04	08.95	77.99	--	77.99*
2	Storage for topsoil	-	-	-	--	-
3	Overburden dump	66.34	0	66.34	--	66.34**
4	Mineral Stock/ Sub Grade dump	10.89	-4.12	06.77	--	06.77 ^a
5	Statutory Buildings	02.80	-02.30	00.50	--	00.50 ^A
6	Roads	01.89	-1.11	00.78	--	00.78
7	Railways	-	-	-	--	-
8	Green belt / safety zone	05.03	-	05.03	-	05.03
9	Crushing/Screening plant	04.60	-1.42	03.18	-	03.18 ^B
10	ETP	-	-	-	-	-
11	Township area	-	-	-	-	-
12	Biodiversity Area	--	-	-	-	-
13	Others					
	Grand Total	160.59		160.59	-	160.59

Land use breakup details :

*Mining: 77.99 Ha (Existing pit 69.04 Ha + 4.93 Ha from existing Mineral stock + 1.12 ha from crushing & screening + 1.11 ha from Road)

**Dump: 66.34 ha (Existing 43.10 ha + 2.30 ha from Statutory building area + 20.94 ha stabilized part of dump)

^aMineral stock: 6.77 ha (Existing 10.89 ha - 4.12 ha for mining)

^A Statutory Building: 0.5 Ha (Existing 2.80 ha - 2.30 ha for dumping)

^B Crushing/Screening Area: 3.18 Ha (Existing 4.60 Ha - 1.42 ha for mining)

SRIPATH PUJAR
Qualified Person

क्षेत्रीय खान नियंत्रक
Regional Controller of Mines

B.V.R. ACHAR
Qualified Person

OP: SripathPujar & BYR Achar

भारतीय खान ब्यूरो
Indian Bureau of Mines,
बंगलूरु / Bangalore - 560 022

This Mining Plan is approved subject to the conditions / stipulations Indicated in the Mining Plan approval letter No. 279/272/91/0NY
Date: 12-03-2020



CONSENT LETTER/ UNDERTAKING/ CERTIFICATE

01. Modification to the approved modified Mining Plan of M.L. No. 267 of Vedanta Limited (Formerly known as Sesa Sterlite Ltd / Sesa Goa Ltd) over an area of 160.59 ha near Meghalahalli & other villages, Chitradurga and Holalkere taluks, Chitradurga district, Karnataka State, under Rule 17(3) of MCR 2016 has been prepared by Sripad Pujar and B.V.R. Achar. This is to request the Regional Controller of Mines, Indian Bureau of Mines, Bengaluru, to make any further correspondence regarding any correction of the Mining Plan with the said qualified persons at his address below:

SRIPAD PUJAR
B.V.R. ACHAR
 ROCK TECH ENTERPRISES, First floor, Sapthagiri Enclave,
 College Road, Hosapete - 583 201,
 Bellary Dist. Karnataka

We hereby undertake that all modifications / updating as made in the said Mining Plan by the said qualified persons be deemed to have been made with my knowledge and consent and shall be acceptable on me and binding in all respects.

02. It is certified that the CCOM Circular No-2/2010 will be implemented and complied with when an authorized agency is approved by the State Govt.

03. It is certified that the Progressive Mine Closure Plan of M.L. No. 267 of Vedanta Limited (Formerly known as Sesa Sterlite Ltd / Sesa Goa Ltd) over an area of 160.59 ha complies with all statutory rules, Regulations, Orders Made by the Central or State Government, Statutory organization, Court etc, which have been taken into consideration and wherever any specific permission is required the lessee will approach the concerned authorities.

The information furnished in the Progressive Mine Closure Plan is true and correct to the best of my knowledge and records.
 Further, all the measures proposed in this closure plan will be implemented in a time bound manner as proposed.

04. The provisions of Mines Act, Rules and Regulations made there under have been observed in the Mining Plan over an area of 160.59 ha, belonging to Vedanta Ltd near Meghalahalli & other villages, Chitradurga and Holalkere taluks, Chitradurga district, Karnataka State and where specific permissions are required, the applicant will approach the D.G.M.S. Further, standards prescribed by D.G.M.S. in respect of miners' health will be strictly implemented.

For Vedanta Ltd

[Signature]
Sri Sauvik Mazumdar
 Nominated Owner

Place:

Date:

VEDANTA LIMITED

Sesa Goa Iron Ore, Karnataka

Meghalahalli Office Complex, Bheemavandur, Chitradurga, Karnataka - 577 320 T
 681-94250107 www.vedantaonline.com

Registered Office: Vedanta Limited, 3rd Floor, 'C' wing, Unit 103, Corporate Avenue, AIF Projects, Chokkai, Andheri (East), Mumbai-400063, Maharashtra, India
 CIN: 113200MH1965PLC295394



CERTIFICATE FROM QP

The provisions of the Mineral Conservation and Development Rules 2017 have been observed in the preparation of Modification to the approved Review and Updation of Mining Plan including Progressive Mine Closure Plan of M.L. No. 2677 of Vedanta Limited (Formerly known as Sesa Sterlite Ltd / Sesa Goa Ltd) over an area of 160.59 ha near Meghalahalli & other villages, Chitradurga and Holalkere taluks, Chitradurga district, Karnataka State and whenever specific permissions are required, the applicant will approach the concerned authorities of Indian Bureau of Mines.

The information furnished in the Mining Plan is true and correct to the best of our knowledge.


SRIPATH PUJAR
Qualified Person


B.V.R. ACHAR
Qualified Person

Place: Hosapete
Date: 11.03.2020.

PHOTOGRAPHS



Mine and Dump Photos M/s, Vedanta Ltd. ML . No. 2677



A view of South Block Mining pit



A view of North Block Mining pit

Mine and Dump Photos M/s, Vedanta Ltd. ML . No. 2677



A view of Dump 3- Active Dumping



A view of Stack of Siliceous ore

ML No 2677 of M/s Vedanta Ltd



RW-2 & GD-2: Retaining Wall and Garland Drain below Dump-2 between BP-12 & 13

Latitude: 14°13'14.7"N

Longitude: 76°12'13.2"E



RW-6 & GD-6: Retaining Wall and Garland Drain below ID2 in South west corner of South Block

Latitude: 14°13'34.2"N

Longitude: 76°12'04.6"E

ML NO: 2677 of M/s Vedanta Ltd.



RW-7 & GD-7: Retaining Wall and Garland Drain below ID3 in North Eastern side of South Block

Latitude: 14°13'29.8"N

Longitude: 76°12'43.6"E



RW-1 & GD-1: Retaining Wall and Garland Drain below Dump-3 between BP-14 & 15

Latitude: 14°13'22.9"N

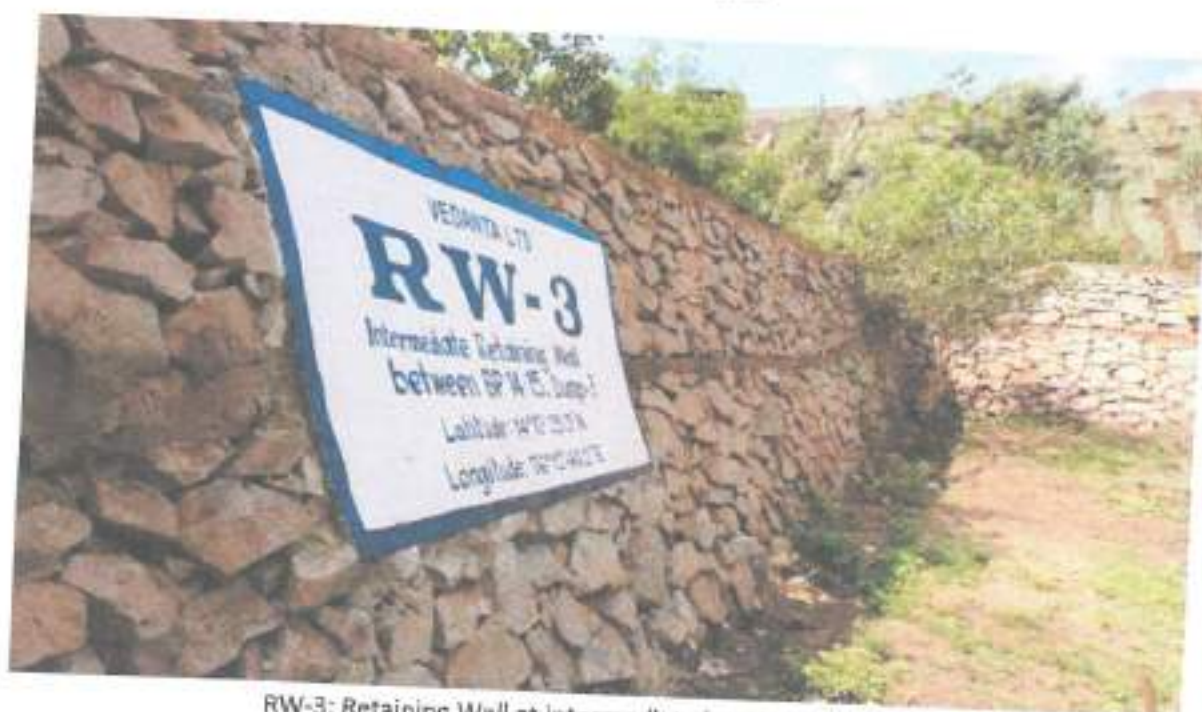
Longitude: 76°12'50.3"E



RW-1 & GD-1: Retaining Wall and Garland Drain below Dump-3 between BP-14 & 15

Latitude: 14°13'29.9"N

Longitude: 76°12'41.2"E



RW-3: Retaining Wall at Intermediate location of Dump-3

Latitude: 14°13'29.3"N

Longitude: 76°12'40.2"E



RW-4 & GD-4: Retaining Wall and Garland Drain below Dump-4 between BP-9 & 10

Latitude: 14°13'47.3"N

Longitude: 76°12'23.0"E

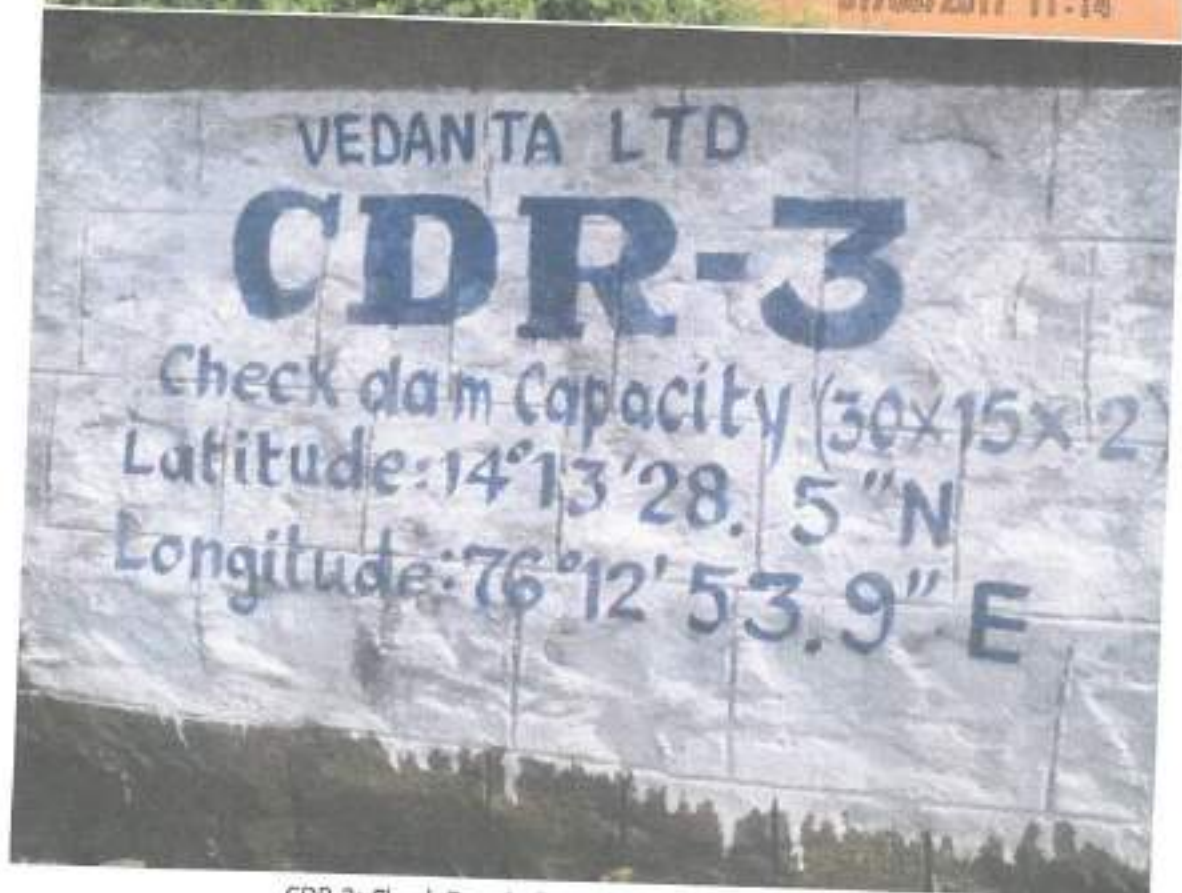


RW-4 & GD-4: Retaining Wall and Garland Drain below Dump-4 between BP-1 & 16

Latitude: 14°13'38.0"N

Longitude: 76°12'27.9"E

MR No 2677 of M/s Vedanta Ltd.



CDR-3: Check Dam in Revenue Land below Dump-3

Latitude: 14°13'28.5"N

Longitude: 76°12'53.9"E



CDF-15: Check Dam in Forest Land
Latitude: 14°13'13.5"N
Longitude: 76°12'56.9"E



CDR-4: Check Dam in Revenue Land below Dump-3
Latitude: 14°13'29.2"N
Longitude: 76°12'52.9"E

ML No 2677 of M/s Vedanta Ltd



CDR-5: Check Dam in Revenue Land below Dump-3

Latitude: 14°13'31.5"N

Longitude: 76°12'52.8"E

ML No: 2677 of M/s Vedanta Ltd.



CDR-07: Check Dam in Revenue Land below Dump-3

Latitude: 14°13'32.2"N

Longitude: 76°12'47.1"E

ML No 3677 of M/s Vedanta Ltd.



CDR-10: Check Dam in Revenue Land below Dump-4

Latitude: 14°13'50.8"N

Longitude: 76°12'29.6"E

ML No 2677 of M/s Vedanta Ltd



CDR-13: Check Dam in Revenue Land below Dump-4

Latitude: 14°4'04."N

Longitude: 76°12'54.4"E

ML No 8677 of M/S Vedanta Ltd.



CDR-9: Check Dam in Revenue Land below Dump-3

Latitude: 14°13'55.1"N

Longitude: 76°12'48.6"E



SPR-2: Settling Pond in Revenue Land below Dump-3

Latitude: 14°13'23.6"N

Longitude: 76°12'49.9"E

Photographs of Boundary Pillars ML No. 2677 of M/s Vedanta Limited





Photographs of Boundary Pillars ML No. 2677 of M/s. Vedanta Limited



Photographs of GCP – ML no. 2677 of Vedanta Ltd



ANNEXURES



"ORIGINAL"

ಕರ್ನಾಟಕ ಸರ್ಕಾರ

GOVERNMENT OF KARNATAKA

ಗಣಿ ಮತ್ತು ಭೂವಿಜ್ಞಾನ ಇಲಾಖೆ

Department of Mines and Geology

ಗಣಿ ಸುತ್ತಿಗೆ MINING LEASE

Registered No. 2677 (RML-2236)Name of Lessee/s M/s Sesa Sterlite Ltd.Date of Grant Renewal Notification No: CI 166 MM 2014/07-01-2015
Addendum No: CI 166 MM 2014/12-01-2015Period Twenty (20) years w.e.f. 28-10-2012

Sripad Pujar
SRIPAD PUJAR
QUALIFIED PERSON

B.V.R. A...
B.V.R. A...
QUALIFIED PERSON

Book-I-8039/2014-15

2014-15 used for the purpose 8039

GOVERNMENT OF KARNATAKA

MINING LEASE

The indenture made this 02nd day of February-2015 200 between the Governor of Karnataka, (Hereinafter referred to as the "State Government" which expression shall, where the context so admits be deemed to include his successors in office and assigns) of the one part and when the lessee/licensee is an individual.

(1)-(1) When the lessee is an individual :

(Name of person with address and occupation) (hereinafter referred as "the lessee" which expression shall, where the context so admits, be deemed to include his heirs, executors, administrators, representative and permitted assigns).

(2)-(2) When the lessees are more than one individual :

(Name of person with address and occupation) and (Name of person with address and occupation) (hereinafter referred to as "the lessee" which expression shall, where the context so admits, be deemed to include their respective heirs, executors, administrators, representatives and other permitted assigns).

(3)-(3) When the lessees is a registered firm :

(Name and address of Partner) son of of all carrying on business in partnership under the firm name and style of (Name of the firm) registered under Indian Partnership Act 1932 (9 of 1932) and having their registered office at in the town of hereinafter referred to as "the lessee" which expression where the context so admits be deemed to include all the partners of the said firm their representatives, heirs, executors, administrators and permitted assigns).

When the lessee is a registered company :

M/s Sesa Sterlite Ltd. (Name of Company)

0554-B-1

2014-15 and 16 and 8039.00

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NAME OF THE LESSEE	: M/S SESA STERLITE LTD.,
EXTENT	: 160.59 HECTARES
VILLAGE	: NIRTHADI RESERVED FOREST RANGE (Harigunta - Hubali) : MEGALAHALLI ----- (Part of Sy.No.21) = 119.465 Ha : BOMMAVVANAGATHIHALLI-- (Part of Sy.No.7) = 0.680 : MADAKERIPURA ---- (Part of Sy.No.18) = 13.681 : CHOWDENAHALLY ---- (Part of Sy.No.1) = 1.666 : TANIGEHALLY----- (Part of Sy.No.35) = 3.880 : HIREKANDAVADI --- (Part of Sy.No.107) = 21.218
TALUK	: HOLALKERE & CHITRADURGA
DISTRICT	: CHITRADURGA

total = 160.59 Ha

COORDINATES OF LEASE BOUNDARY AND REVENUE BANDHS

Sl.No.	REFERENCE/ ML CORNER PTS	GPS READINGS (WGS-84)	
		LATITUDE	LONGITUDE
1	VB-1	14° 13' 48.2"	76° 12' 49.2"
2	VB-2	14° 13' 49.9"	76° 12' 49.3"
3	VB-3	14° 13' 48.1"	76° 12' 36.3"
4	VB-4	14° 13' 42.9"	76° 12' 36.8"
5	VB-5	14° 13' 41.1"	76° 12' 44.4"
6	LBC-1	14° 13' 44.1"	76° 12' 29.1"
7	LBC-2	14° 13' 46.7"	76° 12' 24.5"
8	LBC-3	14° 14' 17.2"	76° 12' 09.7"
9	LBC-4	14° 13' 56.5"	76° 11' 45.1"
10	LBC-5A	14° 13' 45.1"	76° 11' 55.4"
11	LBC-6A	14° 13' 55.3"	76° 12' 06.9"
12	LBC-7A	14° 14' 04.4"	76° 12' 06.5"
13	LBC-8A	14° 14' 07.0"	76° 12' 13.2"
14	LBC-9	14° 13' 47.6"	76° 12' 22.6"
15	LBC-10	14° 13' 33.3"	76° 12' 05.5"
16	LBC-11	14° 13' 19.4"	76° 12' 18.3"
17	LBC-12	14° 13' 17.4"	76° 12' 11.0"
18	LBC-13	14° 12' 54.3"	76° 12' 31.3"
19	LBC-14	14° 13' 17.1"	76° 12' 58.3"
20	LBC-15	14° 13' 33.9"	76° 12' 36.2"
21	LBC-16	14° 13' 37.5"	76° 12' 28.3"

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PART I

THE AREA OF THIS LEASE

Bommawanagathihalli, Madakasipura, choudenahalli,
 LOCATION AND AREA OF THE LEASE:
 Tanigehalli, Hirekanduradi, Nirthadi Reserve forest,
 Megalahalli & other villages.

All that tract of lands situated at (description of
 area of areas) chitradurga & Holalkere in (Pargana) in the Registration
 District of Chitradurga Sub district and
 District Chitradurga bearing Cadastral Survey Nos 21, 7, 18, 1, 35, 107
 containing an area of 160.59 Hectares or thereabouts delineated in plan
 hereto annexed and there on coloured in Red and bounded as
 follows:

On the North by - Part of Sy. No. 18 of Madakasipura & part
 of Nirthadi State Forest.
 On the South by - Part of Sy No: 107 of Hirekanduradi village &
 Part of Sy No: 21 of Megalahalli village.
 On the East by - Part of Sy No: 7 of Bommawanagathihalli & part
 of Sy No. 21, 22, 20 of Megalahalli village
 and
 On the West by - Part of Nirthadi state forest land belongs to
 choudenahalli Sy No. 1 & Tanigehalli Sy No: 35 & part
 hereinafter referred to the said lands of Sy No. 107 of Hirekanduradi village

PART II

LIBERTIES, POWERS AND PRIVILEGES TO BE EXERCISED AND ENJOYED

BY

THE LESSEE/LESSEES SUBJECT TO THE RESTRICTIONS AND CONDITIONS

IN PART III

1. To enter upon land and search for mine work etc.,

Liberty and power at all times during the term demised to enter upon said lands and
 to search for, mine, bore, dig, drill for win, work, dress, process, convert, carry away and
 dispose of the said mineral/minerals.

2. To sink, drive and make pits shafts and inclines etc.,

Liberty and power for or in connection with any of the purposes mentioned in this
 part to sink, drive, make, maintain and use in the said lands any pits, shafts, inclines, drifts,
 levels, water ways, airways and other works. (and to use, maintain, deepen or extend any
 existing works of the like nature in the said lands).

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3. To bring and use machinery, equipment etc.,

Liberty and power for or in connection with any of the purposes mentioned in this part to erect, construct and maintain and use on or under the said lands and engines, machinery plant dressing-floors, furnaces, coke ovens, brick-kilns work-shops, store-houses, bungalows, godowns, sheds and other buildings and other works and conveniences of the like nature on or under said lands.

4. To make roads and ways etc., and use existing roads and ways.

Liberty and power for or in connection with any of the purposes mentioned in this part to make any tramways, railways, roads and other ways in or over the and said lands and to use, maintain and go and repass with or without horses, cattle wagons, locomotives or other vehicles over the same (or any existing tramways, railways road and other ways in or over the said lands) on such conditions may be agreed to.

5. To get building and road materials etc.,

5. Liberty and powers for or in connection with any of the purposes mentioned in this part to quarry and get, ordinary building stone and gravel and other building and road materials (except that of specified minor minerals) and ordinary clay and to use and employ the same and to manufacture such ordinary clay into bricks or tiles and to use such bricks or tiles not to sell any such material, bricks or tiles.

6. To use waters from streams etc.,

Liberty and power for or in connection with any of the purposes mentioned in this part but subject to the rights of any existing or future lessees and with the written permission of the Deputy Commissioner to appropriate and use water from any streams, water-courses, springs or other sources in or upon the said lands and divert, set up or dam any such stream or water-course, culverts, drains or reservoirs but not as to deprive any cultivated lands, villages, buildings, or watering places for livestock of a reasonable supply of water as before accustomed nor in any way to foul or pollute any streams or springs. Provided that the lessee/lessees shall not interfere with the navigation in any navigable streams nor shall divert such stream with out the previous written permission of the State Government.

7. To use and for stacking, heaping or depositing purposes.

Liberty and Power to enter upon and use a sufficient part of surface of said lands for the purpose of stocking, heaping, thereon any produce of the mines or works carried on and any equipment, earth and materials and substances dug or raised under the liberties and powers mentioned in this part.

as per order



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8. Beneficiation and carrying away.

a) Liberty and power to enter upon and use a sufficient part of the said lands to beneficiate any ore produced from the said lands and to carry away such beneficiated ore.

b) To make coke (to be used in case of coal only):

Liberty and power upon the said lands to convert into coke any coal dust produced from the said lands and to carry away such coke.

9. To clear brushwood and to fell and utilise trees, etc.,

Liberty and power for or in connection with any of the purpose mentioned in this part and subject to the existing rights of others and save as provided in clause 3 of part III of this Schedule to clear undergrowth and brushwood and to fell and utilise any trees or timber standing or found on the said lands provided that the State Government may ask the lessee/lessees to pay for any trees or timber felled and utilised by him/them at the rates specified by the Deputy Commissioner or the State Government.

PART III

RESTRICTIONS AND CONDITIONS AS TO THE EXERCISE OF THE
LIBERTIES, POWERS AND PRIVILEGES IN PART II.

1. No building etc. upon certain places.

No building or thing shall be erected, set up, placed and no surface operations shall be carried on in or upon any public pleasure ground, burning or burial ground or place held sacred by any class of persons or any house or village site, public road or other place which the State Government may determine as public ground nor in such manner as to injure or prejudicially affect any buildings, work, property or rights of other persons and no land shall be used for surface operations which is already occupied by persons other than the State Government for works or purposes not included in this lease. The lessee/lessees shall not also interfere with any right of way, well or tank.

2. Permission for surface operations in a land not already in use.

Before using for surface operations any land which has not already been used for such operations the lessee/lessees shall give to the Deputy Commissioner of the district two calendar months previous notice in writing specifying the name or other description of the situation and the extent of the land proposed to be so used and the purpose for which the same is required and the said land shall not be so used if objection is issued by the Deputy Commissioner within two months after the receipt by him of such notice unless the objections so stated shall on reference to the State Government be annulled or waived.

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3. To cut tress in unreserved lands.

The lessee/lessees shall not without the express sanction of the Deputy Commissioner cut down or injure any timber or trees on the said lands but may without such sanction clear away any brushwood or undergrowth which interferes with any operations authorised by these presents. The Deputy Commissioner or the State Government may require the lessee/lessees to pay for any trees or timber felled and utilised by him at the rates specified by the Deputy Commissioner or the State Government.

4. To enter upon reserved forest;

Notwithstanding anything in this Schedule contained the lessee/lessees shall not enter upon any reserved forest included in the said lands without Previous sanction in writing of the District Forest Officer nor fell, cut and use any timber or trees without obtaining the sanction in writing of that Officer nor otherwise than in accordance with such conditions as the State Government may prescribe.

(4A) The lessee/lessees shall not fell any trees in any forest area converted by this lease without reasonable notice to the Forest Officer and except in accordance with the provisions of the law relating to forests for the time being in force.

5. No mining operations within 50 meters of public works etc.,

The lessee/lessees shall not work or carry no or allow to be worked or carried on any mining operations at or to any point within a distance of 50 metres any railways line except with the previous written permission of the Railway Administration concerned or under or beneath any ropeway or any ropeway trestle or station except under and in accordance with the permission of the authority owning the rope way or from any reservoir, canal or other public works such as public roads and buildings or inhabited site except with the previous written permission of the Deputy Commissioner or any other officer authorised by the State Government in this behalf and otherwise than in accordance with such instructions, restrictions and conditions and either general or special which may be attached to such permission. The said distances of 50 metres or 200 metres shall be measured in the case of railway, reservoir or canal horizontally from the outer toe of the bank of the outer edge of the cutting as the case may be and of building horizontally from the plinth thereof. In the case of village roads no working shall be carried on with the previous permission of the Deputy Commissioner or any other officer duly authorised by the State Government in this behalf and otherwise than in accordance with such directions restrictions and additions either general or special which may be attached to such permission [No.1(51)/65-MII dated.26-2-62]

Explanation: For the purposes of this clause, the expression 'Railway Administration' shall have the same meaning as it is defined to have in the Indian Railway Act, 1890, by Clause 6 of Section 3 of that Act, 'Public Road,' shall mean a road which has been constructed by artificially surfaced as district from a trace resulting from repeated use. Village road will include any trace shown in the revenue records as village road.

as of 2014

6. Facilities for adjoining Government licenses and leases.

The lessee/lessees shall allow existing and future holders of Government licenses or leases over any land which is comprised in or adjoins or is reached by the land held by the lessee/lessees reasonable facilities of access thereto.

PROVIDED THAT no substantial hindrance or interference shall be caused by such holder of licenses or leases to the operations of the lessee/lessees under these presents and the lessee/lessees shall be entitled to compensation as may be mutually agreed upon between the lessee/lessees under these presents and fair compensation (as may be mutually agreed upon or in the event of disagreement as may be decided by the State Government) shall be made to the lessee/lessees by reason of the exercise of this liberty.

The lessee/lessees shall not appoint / let any child labourers to work in the mines, failing which action will be initiated to cancel / determined the mining lease.

PART IV

LIBERTIES, POWERS AND PRIVILEGES RESERVED TO THE STATE GOVERNMENT

1. To work other minerals.

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

Provided that in the exercise of such liberty and power no substantial hindrance or interference shall be caused to with the liberties powers and privileges of the lessee/lessees under these presents and that the lessee/lessees shall be entitled to such fair compensation as may be mutually agreed upon or in the event or disagreement as may be decided by the State Government shall be made to the lessee/lessee for all loss or damage sustained by the lessee/lessees by reason or in consequences, of the exercise of such liberty and power.

2. To make railways and roads.

Liberty and power to the State Government or any lessee or person authorised by it in that behalf to enter into and upon the said lands and to make upon over or through the same any railways, tramways or pipelines for any purpose other than those mentioned in Part-II of these presents and to get from the said lands stones, gravel, earth and other

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materials for making, maintaining and repairing such railways, tramways, and roads or any existing railways and roads and to go and repass at all times with or without horses, cattle, or other animals carts, wagons, carriage, locomotives, or other vehicles over or along any such railways, tramways, roads, lines, and other ways for all purposes and as occasions may require provided that in the exercise of such liberty and power by such other lessee or person, no substantial hindrance or interference shall be caused to or with the liberties powers and privileges within the lessee/lessees under these presents and that fair compensation (as may be mutually agreed upon or in the event of disagreement as may be decided by the State Government) shall be made to the lessee/lessees for all loss or damage by substantial hindrance or interference shall be caused to or with the exercise by such lessee or person of such liberty and power.

PART V RENTS AND ROYALTIES RESERVED BY THIS LEASE

1. To pay dead rent or royalty whichever is greater:

That lessee shall pay for every year except the first year of the lease dead rent as specified in clause 2 of the part. Provided that where the holder of such mining lease becomes liable under section 9 of the Act, to pay royalty for any mineral removed or consumed by him or by his agent, manager, employee, contractor sub-lease from the leased area, he shall be liable to pay either such royalty or the dead rent in respect of the area, whichever is higher.

2. Rate and mode of payment of dead rent:

Subject to the provision of Clause 1 of the Part, during the subsistence of the lease the lessor/lessees shall pay to the State Government annual dead rent for the lands demised and described in part-I of this Schedule, the rate for the time being specified in the third schedule to the Act in such manner, as may be, specified in this behalf by the State Government.

Sl. No.	Name of the Mineral	Dead rent fixed per hectare	Area of demised land	Dead rent payable	Total Payable	Dead rent in year
1.	Iron ore	2000/-	-	2000/-	2000/-	
2.		per hect.		per hect.	per hect.	
3.						
4.						
5.						

(Here insert the manner in which and the time at which the dead rent, surface rent and water rate should be paid)

3. Rate and mode of Payment of royalty :

Subject to the provision of Clause 1 of this part, the lessee/lessees shall during the subsistence of this lease pay to the State Government at such times and in such manner as

as per schedule



2014-15 to 2015-16 8039.01
the State Government may prescribe royalty in respect of mineral/minerals removed by him/them from the leased area at the rate for the time being specified in the Second Schedule to the Mines and Mineral (Regulation and Development) Act, 1957.

(3-A). The lessee/lessees shall not remove any ores of minerals from the leased area except under and in accordance with the conditions or a permit issued by the Director of Mines and Geology in Karnataka in payment by the lessee/lessees of the royalty due on the ores or minerals.

4. Payment of surface rent and water rate :

The lessee/lessees shall pay rent and water rate the State Government in respect of all part of the surface of the said lands which shall from time to time be occupied or used by the lessee/lessees under the authority of these present at the rate of Rs. ... 2.50 ... respectively per annum per hectare of the area so occupied or used and so in proportion for any area less than a hectare during the period from the commencement of such occupation or use until the area shall cease to be so occupied or used and shall as far as possible restore the surface land so used to its original condition. Surface rent and water rate shall be paid as herein before detailed in Clause (2), PROVIDED THAT no such rent/water rate shall be payable in respect of the occupation and use of the area comprised in any roads or ways to which the public have full right of access.

5. Local and other cessess and taxes as prevalent in Chitradurga District.

PART VI

PROVISIONS RELATING TO THE RENTS AND ROYALTIES

Rent and royalties to be free from deduction etc.,

1. The rent water rate and royalties mentioned in Part V of this Schedule shall be paid free from any deductions to the State Government at and in such manner as the State Government may prescribe PROVIDED ALWAYS and it is hereby agreed that Rs. the balance standing to the credit of the lessee/lessees on account of the deposit made by him/them as a lessee/lessees over an area which included the said lands shall be retained and accepted by the State Government in satisfaction of the rents and royalties mentioned in Part V until they reach that amount.

2. Mode of computation of royalty.

For the purpose of computing the said royalties the lessee/lessees shall keep a correct account of the mineral/minerals produced and dispatched the account as well as the weight of the mineral/minerals in stock or in the process of export, may be checked by any Officer authorised by the Central or a State Government.

10. 10. 2014

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(Here specify the mode of arriving at ~~the price~~ ³⁰ prices at ~~its amount~~ ¹² of minerals) 2)

3. Course of action if rents and royalties are not paid in time.

Should any rent, royalty or other sums due to the State Government under the terms and conditions of these presents be not paid by the lessee/lessees within the prescribed time, the same may be recovered together with simple interest due there on at the rate of twenty four percent per annum on a certificate of such officer as may be specified by the State Government by general or special order in the same manner as an arrear of land revenue.

PART VII
THE COVENANTS OF THE LESSEE/LESSEES

1. Lessees to pay rents, royalties, Taxes, etc.

The lessee/lessees shall pay the rents and royalties reserved by this lease at such time and in the manner provided in PART V and VI of these presents and also may and discharge all taxes, rates assessments and impositions whatsoever being in the nature of public demands which shall from time to time be charged, assessed or imposed by the authority of the Central and State Government upon or in respect of the premises and works of the lessee/lessees in common with other premises and works of alike nature except demands for land revenues.

2. To maintain and keep boundary marks in good order.

The lessee/lessees shall at his/their own expenses erect and at all times maintain and keep in repair boundary marks and pillars according to the demarcation to be shown in the plan annexed to this lease/lessees. Such marks order and pillars shall be sufficiently clear of the shrubs and other obstructions as to allow easy identifications.

3. To commence operations within a year and work in a workman like manner.

The lessee/lessees shall commence operation within a year from the date of execution of the lease and shall thereafter at all times during the continuance of this lease, search for, win, work and develop the said minerals without voluntary intermission in a skilful and workman like manner and prescribed under clause 12 hereinafter without doing or permitting to be done any unnecessary or avoidable damage to the surface of the said lands or the drops, buildings, structures, or other property for the purposes of this clause. operation shall include the erection of machinery laying of a tramway or construction of a road in connection with the mine.

4. To indemnify Government against all claims.

The lessee/lessees shall make and pay such reasonable Satisfaction & compensation as may be assessed by lawful authority in accordance with the law in force on the subject

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for all damage, injury or disturbance which may be done by him/them in exercise of the powers granted by this lease and shall indemnify and keep indemnified fully and completely State Government against all claims which may be made by any person or persons in respect of any such damage, injury or disturbance and all costs and expenses in connection therewith.

5. To secure and keep in good condition pits shafts etc.,

The lessee/lessees shall during the subsistence of this lease well and sufficiently secure and keep open with timber or other durable means all pits shafts and that may be made or used on the said land make and maintain sufficient fences to the satisfaction of the State Government round every such pit, shaft or working whether the same is abandoned or not & shall during the same period keep all working in the said lands, except such as may be abandoned assessable free from water and foul air as far as possible.

6. To strengthen and support the Mines to necessary extent.

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

7. To allow inspection of working.

The lessee/lessees shall allow any officer authorised by the Central Government or the State Government in that behalf to enter upon the premises including any buildings, excavation or land comprised in the lease for the purpose of inspecting, examining, surveying prospecting and making plans there of sampling and collecting any data and the lessee/lessees shall with proper person employed by the lessee/lessees and acquainted with the mines and works effectually assist such officer, agents, servants and workmen in conducting every such inspection and shall afford them all facilities, information connected with the working of the mines which they may reasonably require and also shall and will conform to and observe all orders and regulations which the Central or State Governments as the result of such inspection or otherwise may from time to time deem fit to impose.

8. To report accidents.

The lessee/lessees shall without delay send to the Deputy Commissioner/Director of Mines and Geology a report of any accident causing death or serious bodily injury or serious injury to property or seriously affection or endangering life or property which may occur in the course of the operation under this lease.

9. To report discovery of other minerals.

The lessee/lessees shall report to the State Government, the discovery in the leased area of any mineral not specified in the lease within sixty days of such discovery along with full particulars of the nature and position of each such find. If any mineral not

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specified in the lease is discovered in the leased area the lessee/lessees shall not win and dispose of such mineral unless such mineral included in the lease or a separate lease is obtained therefore.

10. To Keep records and account regarding production and employees etc:

The lessee/lessees shall at all times during the said term keep or cause to be kept at an office to be situated upon or near the said lands correct and intelligible books of accounts which shall contain accurate entries showing from time to time.

- (1) Quantity and quality of the said mineral/ minerals realised from the said lands;
- (2) Quantity of the various qualities of the ores beneficiated or converted. (for example coal converted into coke)
- (3) Quantities of the various qualities of the said mineral/minerals sold and exported separately.
- (4) Quantities of the various qualities of the said mineral/minerals otherwise disposed of in the manner and purpose of such disposal.
- (5) The prices and all other particulars of all sales of the said mineral/minerals.
- (6) The number of persons employed in the mines or works or upon the said lands specifying nationality, qualifications and pay of the technical personnel.
- (7) Such other facts, particulars and circumstances as the Central or the State Governments may from time to time required and shall also furnish free of charge to such officers and at such times as the Central and State Governments may appoint, true and correct abstracts of all or any such books of accounts and such information and returns to all or any of the matters aforesaid as the State Governments may prescribe and shall at all reasonable times allow such officers as the Central Government or State Government shall in that behalf appoint, to enter into and have access to the said officers for the purposes of examining and inspecting the said books of accounts, plans and records and to make copies thereof and make extracts there from.

11. To maintain plans etc.,

The lessee/lessees shall at all times during the said term maintain at the mine office correct, intelligible, up to-date complete plans sections of the mines in the said lands. They shall show all the operations workings, and all the trenches, pits and drillings made by the him/them in the course of operations carried on by him/them under the lease, faults and other disturbances encountered and geological data and all such plans and sections shall be amended and filled up by and from actual surveys to be made for that purposes at the end of

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twelve months or any period specified from time to time and the lessee/lessees shall furnish free of charge to the Central and State Governments true and correct copies of such plans and section whenever required. Accurate records of all trenches, pits and drillings shall show:-

- (a) The sub-soil and strata through which they pass.
- (b) Any minerals encountered.
- (c) Any other matter of interest and all data required by the Central and State Government from time to time.

The lessee/lessees shall allow any officer of the Central or the State Governments authorised in this behalf by the Central Government, to inspect the same at all reasonable times. He/they shall also supply when asked for by the State Government/ the Coal Controller/ the Director/General Geological Survey of India/the Controller Indian Bureau of Mines, a composite plan of the area showing thickness dip, inclination, etc., of all the seams as also the quantity of reserves quality wise.

- 11A. The lessee shall pay a wage not less than the minimum wage prescribed by the Central or State Government from time to time.
- 11B. The lessee shall comply with provisions of the Mines Act, 1952 and rules made there-under.)
- 11C. The lessee shall take measures for the protection of environment like planting of trees, reclamation of land, use of pollution control devices; and such other measures as may be prescribed by the Central or state Government from time to time at his own expenses.
- 11D. The lessees shall pay compensation to the occupier of the land on the date and in the manner laid down in these rules.
- 11E. The lessee shall in the matter of employment give preference to the tribals and to the persons who become displaced because of the taking up of mining operations.

12. Act 67 of 1957 :

The lessee/lessees shall be bound by such rules may be issued from time to time by the Government of India under Section 18 of the Mines and Minerals (Regulations and Development) Act, 1957 (Act 67 of 1957) and shall not carry on mining or other operation under the said lease in any way other than as prescribed under these rules.

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13. To provide weighing machine:

Unless specifically exempted by the State Government the lessee/lessees shall provide and at all time keep at or near the pit head or each of the pit heads at which the said minerals shall be brought to bank a properly constructed and efficient weighing machine and shall weigh or cause to be weighed thereon all the said minerals from time to time brought to bank sold exported and converted and also the converted products shall at the close of each day cause the total weights, ascertained by such means of the said minerals, ores products raised, sold, exported and converted during the previous twenty-four hours to be entered in the aforesaid books of accounts. The lessee/lessees shall permit the State Government at all times during the said term to employ and persons or persons to be present at the weighing of the said minerals as aforesaid and to keep accounts thereof and to check the accounts kept by the lessee/lessees. The lessee/lessees shall give fifteen days previous notice in writing to the Director of Mines and Geology of every such measuring or weighing in order that he or some officer in his behalf may be present thereat.

14. To allow test of weighing machine :

The lessee/lessees shall allow any person or persons appointed in that behalf by the State Government at any time or times during the said term to examine and test every weighing machine to be provided and kept as afore-said and the weights used there with in order to ascertain whether the same respectively are correct and in good repair and order if upon any such examination or testing any such weighing machine or weights shall be found incorrect or out of repair or order the State Government may require that the same be adjusted, repaired and put in order by and at the expenses of the lessee/lessees and if such requisition be not complied with within fourteen days after the same shall have been made, the State Government may cause such weighing machine or weights to be adjusted, repair and put in order and the expense of so doing shall be paid by the lessee/lessees to the State Government on demand and if upon any such examination or testing as aforesaid any error shall be discovered in any weighing machine or weights to the prejudice of the State Government such error shall be regarded as having existed for three calendar months previous to the discovery thereof or from the last occasion of so examining and testing the same weighing machine and weights in case such occasion shall be within such period of three months and the said rent and royalty shall be paid and accounted for accordingly.

15. To pay compensation for injury to third parties :

The lessee/ lessees shall make any pay reasonable satisfaction and compensation for all damage, injury or disturbance of person or property which may be done by or on these

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part of the lessee/lessees in exercise of the liberties and powers granted by the State Government shall at all times have harmless and keep indemnified the State Government from and against all suits, claims and demands which may be brought made by any person in respect of any such damage, injury or disturbance.

16. Not to obstruct working of other minerals.

The lessee/lessees will exercise the liberties and powers hereby granted in such a manner as to offer no unnecessary or reasonable avoidable obstructions or interruption to the development and working within the said lands of any minerals not included in this lease and shall at all times afford to the Central and State Government and to the holders of prospecting licence or mining leases in respect of any such minerals or any such minerals within any land adjacent to the said lands as the case may be reasonable means of access and safe and convenient passage upon and across the said lands to such minerals for the purpose of getting working, developing and carrying away the same provided that the lessee/lessees shall receive reasonable compensation for any damage or injury which he/they may sustain by reason or in consequence of the use of such passage by such lessee/lessees or holders of prospecting licences.

17. Transfers of lease :

1. The lessee/lessees shall not, without the previous consent in writing of the State Government, which in the case of a mining lease in respect of any mineral specified in the first Schedule to the Act shall not be given except after previous approval of the Central Government:

- a) assign, subject, mortgage or in any other manner, transfer the mining lease or any right, title or interest therein or
- b) enter into or make any arrangement, contract or understanding whereby the lessee/lessees will or may be directly or indirectly financed to a substantial extent by or under which the lessee's operations or undertakings will or may be substantially controlled by any person or body of persons other than the lessee/lessees.

Provided that the State Government shall not give its written consent unless:

- a) the lessee has furnished an affidavit along with his application for transfer of the mining lease specifying therein the amount that he has already taken or proposes to take as consideration from the transferee.
- b) the transfer of the mining lease is to be made to a person or body directly undertaking mining operations.

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(2) Without prejudice to the above provisions, the lessee/lessees may subject to the condition specified in the proviso to Rule 35 of said Rules, transfer this lease or any right, title or interest therein, to a person who has filed and affidavit stating that he has filed upto date income tax returns, paid income tax assessed in him and paid the income tax on the basis of self assessment as provided in the Income tax Act 1961 (43 of 1961) on payment of five hundred rupees to the State Government.

Provided that the lessee/lessees shall make available to the transferee the original or certified copies of all plans of abandoned workings in the area and in a belt meters wide surrounding it.

Provide further that where the Mortgage is an institution or a Bank or a Corporation specified in Schedule V it shall not be necessary for any such institution Bank of Corporation to meet with the requirement relating income tax.

(3) The State Government may by order in writing, determine the least at any time if the lessee/lessees has/have in the opinion of the State Government committed a breach of any of the above provisions or has/have transferred the lease or any right, title or interest therein otherwise than in accordance with clause(2);

Provided that no such order shall be made without giving the lessee/lessees a reasonable opportunity stating his/their case.

18. Not to be financed or controlled by a Trust, Corporation Firm or person.

The lease shall not be controlled and the lessee/lessees shall not allow themselves to be controlled by any Trust, Syndicate, Corporation, Firm or person except with the written consent of the Central Government. The lessee/lessees shall not enter into or make any arrangement compact or understanding whereby the lessee/lessees will or may be directly or indirectly financed by or under which the lessee/lessees operations or undertakings will or may be carried on directly or indirectly by or for the benefit of or subject to the control of any Trust, Syndicate, Corporation, Firm or person unless with the written sanction given prior to such arrangement compact or understanding being entered into or made of the Central Government and any or every such arrangement compact or understanding as aforesaid entered into or made with such sanction as aforesaid) shall only be entered into or made and shall always be subject to an express condition binding upon the other party of parties thereto that on the occasion of state of emergency of which the President of India in his discretion shall be the sole judge it shall be terminable if so required in writing, by the State Government and shall in the event of any such requisition being made be forthwith thereafter determined by the lessee/lessees accordingly.



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The lessee/lessees shall at the expiration or sooner determination of the said term or its renewal thereof deliver up to the State Government all mines, pits shafts, inclines drifts levels, waterways, airways, and other works now existing or hereafter to be sunk or made on or under the said lands except such as have been abandoned with the sanction of the Government and in an ordinary and fair course of working all engines machines plant, buildings, structures, other works and convenience which at the commencement of the said term were upon or under the said lands and all such machinery set up by the lessee/lessees below ground which cannot be removed without causing injury to the mines or works under the said lands (except such of the same as may with the sanction of the State Government have become discarded) and all buildings and structures of bricks or stone erected by the lessee/lessees above ground level in good repair order and condition and fit in all respects for further working of the said mines and the said minerals.

- a) The State Government shall from time to time and all times during the said term have the right (to be exercised by notice in writing to the lessee/lessees) of pre-emption of the said minerals (and all products thereof) lying in or upon the said lands hereby demised or elsewhere under the control of the lessee/lessees and the lessee/lessees shall with all possible expedition deliver all mineral or products or minerals purchased by the State Government under the power conferred by this provision in the quantities at the times in the manner and at the place specified in the notice exercising the said right.
- b) Should the right of pre-emption conferred by this present provision be exercised and a vessel chartered to carry the minerals or products thereof procured on behalf of the State Government or the Central Government be detained on demurrage at the port of loading the lessee/lessees shall pay the amount due to causes beyond the control of the lessee/lessees.

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- c) The price to be paid for all minerals or products of minerals taken in pre-emption by the State Government in exercise of the rights hereby conferred shall be the fair market price prevailing at the time of pre-emption PROVIDED THAT in order to assist in arriving at the said fair market price the lessee/lessees shall if so required furnish to the State Government for the confidential information of the Government particulars of the quantities, descriptions and prices of the said minerals or products thereof sold to other customers and of charters entered into for freight carriage of the same and shall produce to such officer or officers as may be directed by the State Government original or authenticated copies of contracts and charter parties entered into for the sale of freightage of such minerals or products.
- d) In the event of the existence of a state or war of emergency (of which existence of President of India shall be the sole judge and a notification to this effect in the Gazette of India shall be conclusive proof) the State Government with the consent of the Central Government shall from time to time and all times during the said term have the right (to be exercised by a notice in writing to the lessee/lessees) forthwith take possession and control of the works, plant, machinery and premises of the lessee/lessees on or in connection with the said lands or operations under this lease and during such possession or control the lessee/lessees shall conform to and obey all direction given by or on behalf of the Central Government or State Government regarding to use of employment of such works, plants, premises and minerals. PROVIDED THAT fair compensation which shall be determined in default of agreement by the State Government shall be paid to the lessee/lessees for all loss or damage sustained by him/them by reason or in consequence of the exercise of the powers conferred by this clause and PROVIDED ALSO that the exercise of such powers shall not determine the said term hereby granted or effect the terms and provisions of these presents further that may be necessary to give effect to the provisions of this clause.

22. Employment of Foreign National

The lessee/lessees shall not employ, in connection with the mining operations any person who is not an Indian national except with the previous approval of Central Government.

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23. Recovery of expenses incurred by the State Government

If any of the works or matters which in accordance with the covenants in that behalf hereinbefore contained are to be carried or performed by the lessee/lessees be not so carried out or performed within the time specified in that behalf, the State Government, may cause the same to be carried out or performed and the lessee/lessees shall pay the State Government on demand all expenses which shall be incurred in such carrying out or performance of the same and the decision of the State Government as to such expenses shall be final.

24. Furnishing of Geophysical data

The lessee/lessees shall furnish-(a) all geophysical data relating to mining fields or engineering and ground water surveys, such as anomaly maps, sections, plans, structures, contour maps, logging, collected by him/ them during the course or mining operations to the Director General, Geological Survey of India, Calcutta.

(b) all information pertaining to investigations of radio active minerals collected by him/ them during the course of mining operations to the Secretary, Department of Atomic Energy, New Delhi.

Data or information referred to above shall be furnished every year reckoned from the date of commencement of the period of the mining lease.

(c) lessee shall install RFID integrated weigh bridge in the lease premises and arrange transportation of PART VIII ore so produced from the mine as per sub-rule 3(7) of chapter II of the Karnataka (Prevention of Illegal Mining, Transportation and Storage of Minerals) The Covenants of the State Government Rules-2011.

1. Lessee/Lessees may hold and enjoy rights quietly

The lessee/lessees paying the rents, water rate and royalties here by reserve and observing and performing all the covenants and agreements herein contained and on the part of the lessee/lessees to be observed and performed shall and may quietly hold and enjoy the rights and premises hereby demised for and during the term hereby granted without any unlawful interruption from the State Government, or any person rightfully claiming under it.

2. Acquisition of lands of third parties and compensation thereof

If in accordance with the provision of Clause 4 of Part VII of this Schedule, the lessee/lessees shall offer to pay to an occupier of the surface of any part of the said lands compensation for and damage or injury which may arise from the proposed operations of the lessee/lessees and the said occupier shall refuse his consent to be exercise of the right and powers reserved to the State Government and demised to the lessee/lessees by these presents and the lessee/lessees shall report the matter to the State Government and shall

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deposits with it the amount offered as compensating and if the Central/State Government are satisfied that the amount of compensation offered is fair and reasonable or if it is not so satisfied and the lessee/lessees shall have deposited with it such further amount as the State and Central Governments shall consider fair and reasonable, the State Government shall order the occupier to allow the lessee/lessees to enter the land and to carry out such operations as may be necessary for the purpose of this lease. In assessing the amount of such compensation the State Government shall be guided by the principles of the Land Acquisition Act.

3. To renew :

The mining lease is renewable in terms of the Provisions of the Act and the rules made there under.

Provided that the State Government may for reasons to be recorded in writing reduce the area applied for.

If the lease is in respect of minerals specified in the First Schedule to the Act, renewal will be subject to the prior approval of the Central Government.

If the lessee/lessees be desirous of taking a renewal lease of the premises hereby demised or of any part or parts of them for a further term from the expiration of the term hereby granted and is otherwise eligible, he/ they shall prior to the expiration of the last mentioned term give to the State Government 12 calendar months previous notice in writing and shall pay the rents, rates and royalties hereby reserved and shall observe and perform the several covenants and agreements herein contained and on the part of the lessee/lessees to be observed and performed up to the expiration of the term hereby granted. The State Government on receipt of application for renewal, shall consider it in accordance with the provisions of the Act and the rules made thereunder and shall pass orders as it deems fit. If renewal is granted the State Government will at the expense of the lessee/lessees and upon his executing and delivering to the State Government if required a counter part thereof execute and deliver to the lessee/lessees a renewed lease of the said premises or part thereof for the further term of (20) Twenty years at such rents, rates, and royalties and on such terms and subject to such rents, rates and royalties and on such terms and subject to such covenants and agreements, including this present covenant to renew as shall be accordance with the Mineral Concession Rules, 1960, applicable to Iron ore - (Name of Mineral on the day next following the Expiration of the terms hereby granted).

4. Liberty to determine the lease:

The lessee/lessees may at any time determine this lease by giving not less than 12 calendar months notice in writing to the State Government or to such officer, or authority as the State Government may specify in this behalf and upon the expiration of such notice provided that the lessee/lessees shall upon such expiration tender and pay all rents, water rates, royalties compensation for damages and other moneys which may then be due and

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payable under these presents to the lessor or any other person or persons and shall deliver up these presents to the State Government the lease and the said term and the liberties, powers and privileges hereby granted shall absolutely cease and determine but without prejudice to any right or remedy of the lessor in respect of any breach of any of the covenants or agreements contained in these presents.

- a. The State Government may on an application made by the lessee permit him to surrender one or more minerals from his lease which is for a group of minerals on the ground that deposits of that mineral have since exhausted or depleted to such an extent that it is no longer possible to work the mineral economically, subject to the condition that the lessee-
 - b. Makes an application for such surrender of mineral at least six months before the intended date of surrender; and
 - c. Gives an undertaking that he will not cause any hindrance in the working of the mineral so surrendered by any other person who is subsequently granted a mining lease for that mineral.

5. Refund of security deposit

On such date as the State Government may elect within twelve calendar months after the determination of this lease or of any renewal thereof, the amount of the security deposit paid in respect of this lease and then remaining in deposit with the State Government and not required to be applied to any of the purposes mentioned in this lease shall be refunded to the lessee/lessees. No interest shall run on the security deposit.

PART IX

General Provisions

1. Obstructions to Inspection

In case the lessee/lessees or his/their transferee/assignee does/do not allow entry or inspection by the Officers authorised by the Central or State Government under clauses (i), (j) or (l) of sub-rule (1) rule 27 of said Rules, the State Government shall give notice in writing to the lessee/lessees requiring him/them to show cause within such time as may be specified in the notice why the lease should not be determined and his/their security deposit forfeited; and if the lessee/lessees fails/fail to show cause within the aforesaid time to the satisfaction of the State Government, the State Government may determine the lease and forfeit the whole or part of the security deposit.

2. Penalty In case of default in payment of royalty and breach covenants:

If the lessee/lessees or his/their transferee or assignee makes/make any default in payment of rent or water rate or royalty as required by Section 9 of the Act of rent or

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commits a breach of any of the conditions and covenants other than those referred to in covenant (1) above, the State Government shall give notice to the lessee/lessees requiring him/them to pay the rent water rate, royalty or remedy the breach, as the case may be, within sixty days from the date of receipt of the notice and if the rent, water and royalty are not paid or the breach is not remedied within such period, the State Government may without prejudice to any proceedings that may be taken against him/them, determine the lease and forfeit the whole or part of the security deposit.

3. Penalty for repeated breaches of covenants

In cases of repeated breaches of covenants and agreements by the lessee/lessees for which notice has been given by the State Government in accordance with clauses (1) and (2) aforementioned on earlier occasion, the State Government without giving any further notice may impose such penalty not exceeding twice the amount of annual deed rent specified in Clause 2, Part V.

4. Failure to fulfill the terms of leases due to "Force Majeure"

Failure on the part of the lessee/lessees to fulfill any of the terms and conditions of this lease shall not give the Central or State Government any claim against the lessee/lessees or be deemed a breach of this lease. In so far as such failure is considered by the said Government to arise from force majeure, and if through force majeure the fulfillment by the lessee/lessees of any of the terms and conditions of this lease be delayed, the periods and such delay shall be added to the period fixed by this lease. In this clause the expression "Force Majeure" means Act of God, war, insurrection, riot, civil commotion, strike, tide, storm, tidal wave flood, lightning, explosion, fire, earthquake and any other happening which the lessee/lessees could not reasonably prevent or control.

5. Lessee/Lessees to remove his/their properties on the expiry of lease:

The lessee/lessees having first paid and discharged rents, rates and royalties payable by virtue of these Presents may at the expiration or sooner determination of the said term or within six calendar months thereafter (unless the lease shall be determined under clauses 1 and 2 of this Part and in this case at any time not less than three calendar months not more than six calendar months after such determination) take down and remove for his/their own benefit or any engines, machinery plant, buildings, structures, tramways, railway and other works, erections and conveniences which may have been erected/set up or placed by the lessee/lessees in or upon the said lands and which the lessee/lessees is/are not bound to deliver to the State Government under clause 20 of Part VII of this Schedule and which the State Government shall not desire to purchase.

6. Forfeiture of property left more than six months after determination of lease

If at the end of six calendar months after the expiration or sooner determination of the said term under the provision contained in clause 4 of Part VIII of this Schedule become effective there shall remain in or upon the said land any engines machinery plant,

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buildings, structures tramway, railway, or other works and conveniences or other property which are not required by the lessee/lessees in connection with operations in any other lands held by him/them under prospecting licence or mining lease the same shall if not removed by the lessee/lessees within one calendar months after notice in writing requiring their removal has been given to the lessee/lessees by the State Government be deemed to become the property of the State Government and may be sold or disposal of in such manner as the State Government shall deem fit without liability to pay any compensation or to account to the lessee/lessees in respect thereof.

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7. Notices

Every notice by these presents required to be given to the lessee/lessees shall be given in writing to such person resident on the said lands as the lessee/lessees may appoint for the purpose of receiving such notice and if there shall have been no such appointment then every such notice shall be sent to be lessee/lessees by registered post addressed to the lessee/lessees at the address recorded in the lease or at such other address in India at the lessee/lessees may from time to time in writing to the State Government designate for the receipt of notice and every such service shall be deemed to the proper and valid service upon the lessee/lessees and shall not questioned or challenged by him.

8. Immunity of State Government from liability to pay compensation

If in any event of the orders of the State Government are revised, reviewed or cancelled by the Central Government in pursuance of proceedings under Chapter VII of Mineral Concession Rules, 1960, the lessee/lessees shall not be entitled to compensation for any loss sustained by the lessee/lessees in exercise of the powers and privileges conferred upon him/them by these presents.

"(8A) The lease is executed at Bangalore the Capital town of the state of Karnataka (Name of the State) and subject to the provision of Article 226 of the Constitution of India it is hereby agreed upon by the lessee and the lessor that in the event of any dispute in relation to the area under lease, condition of lease, the dues realisable under the lease and in respect of all matters touching the relationship of the lessee and the lessor, the suits (or appeals) shall be filed in the Civil Courts at Chitradurga (Name of the city) and it is hereby expressly agreed that neither party shall be competent to file and petition at any place other than the courts named above."

9. For the purpose of stamp duty the anticipated royalty from the demised land is Rs. 10,136,91,400/- per year.

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Signature



2014-15A and the date 2039

30 October 26

IN WITNESS WHEREOF these presents have been executed in the manner hereunder appearing the day and year first above written.

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In the presence of
SESA STERLITE LTD.
Mining Division,
Karnataka "Mines and Geology Office Complex",
Near Chitradurga Village
CHITRADURGA-577 520
Dist. Chitradurga
Ph: 08194 238110

Signed by

[Signature]

for and on behalf of the
Governor of Karnataka

for and on behalf of

In the presence of

[Signature]
Additional Director (Mineral)
Department of Mines & Geology
Bangalore

For Sesa Sterlite Limited

[Signature]

Head Iron Ore Karnataka

1/ *[Signature]*

B.R. Lavagha s/o A. Revanna
N. Sarga Nilaya,
Dhavalagiri 2nd stage
Bheemasaundari Road Chitradurga.

2/ *[Signature]*

G. R. Nagaraja s/o late G. S. Ramechandra Rao
No 495 S. Raghavendra Nilaya
Dhavalagiri 2nd stage Bheemasaundari
Chitradurga 577501



25] ADDITIONAL CONDITIONS:

"The owner of a mining lease shall:

- (a) Ensure that prospecting work is carried out in his lease area at his own cost in such mining lease where:
 - (i) Prospecting has not been done and a Prospecting Report has not been filed with the Indian Bureau of Mines;
 - (ii) The Prospecting Report for the mining lease has been prepared in terms of standards that are materially different or incompatible with UNFC standards;
 - (iii) Fresh prospecting work has become necessary for such minerals for which the threshold values have been revised by the Indian Bureau of Mines; and
 - (iv) Fresh prospecting is required to prove the depth persistency of the ore or mineral deposit;
- (b) Ensure that prospecting work, if required under clause (a) above, shall be completed as per the time-schedule given below:

| Sl. No. | Item | Time limit |
|---------|---|---|
| 1 | All mining lease with an area of less than 10 hectares. | Within one year of the imposition of the condition in the mining lease. |
| 2 | All mining leases with an area more than 10 hectares and less than 50 hectares. | One half of the area within one year of the imposition of the condition in the mining lease and remaining half of the mining lease area within three years of imposition of condition in the mining lease. |
| 3 | All mining leases with an area of more than 50 hectares. | The mining lease area to be equally demarcated for prospecting work such that all the prospecting work is completed in a period of five years from the date of imposition of the condition in the mining lease. |

(c) Submit:

- (i) Yearly report on the progress in the prospecting work alongwith the expenditure details and a copy of the interim Prospecting Report, where 3 the prospecting Report is for a part area (as at serial number (2) and (3) of the sub-clause (b) above; and
- (ii) Complete Prospecting Report with a feasibility report at end of the prospecting Report, to the Chief Controller of Mines, Indian Bureau of Mines, and concerned State Government".

26) This deed is executed subject to the conditions mentioned in the notification and addendum No.CI 166 MMM 2014 dated 07-01-2015 & 12-01-2015 respectively.

27) Any difference amount in the stamp duty and registration fee, arises later lessee shall pay the same immediately upon intimation.

28) Lessee shall not engage child / bonded labours in mining.

DIRECTOR

Dept. of Mines & Geology

SESA STERLITE LTD.

Mining Division,
Karnataka "Megashah Office Complex",
Near Megashah Village
BHEEMASAMUDRA-577 520
Dist. Chitradurga
Ph. 0844-23811

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30ನೇ ಮಾರ್ಚ್ 29ನೇ ಮಾರ್ಚ್

| ಕ್ರಮ
ನಂ. | ಹೆಸರು ಮತ್ತು ವಿವರ | ಸಹಿ |
|-------------|---|--------------|
| 1 | ಪ್ರಧಾನ ಕಾರ್ಯದರ್ಶಿ ಮತ್ತು ಮುಖ್ಯಸ್ಥರು
ಯೋಜನೆ, ಸಂಸ್ಥಾಪನೆ, ಮತ್ತು ಸಂಸ್ಥಾಪನೆ | <i>Rushe</i> |
| 2 | ವಿ.ಆರ್. ಎಚ್.ಎಸ್.ವಿ. ರಾಜ್ಯ
ಯೋಜನೆ, ಸಂಸ್ಥಾಪನೆ, ಮತ್ತು ಸಂಸ್ಥಾಪನೆ | <i>Ram</i> |

ಹರಿಯ ಶಾಂತಿ ಸಂಸ್ಥಾಪನಾಧಿಕಾರಿ
ಜಿಲ್ಲಾಧಿಕಾರಿ

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ಸಹಿ, ನಂ. CDG140 ನೇ ಮೂಲ
ದಿನಾಂಕ 13-02-2015 ರಂದು ಸೋದಾಯಿಸಲಾಗಿದೆ

[Signature]
ಅಧ್ಯಕ್ಷರು
ಹರಿಯ ಶಾಂತಿ ಸಂಸ್ಥಾಪನಾಧಿಕಾರಿ



Designed and Developed by C-DAC, ACTS, Pune

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ಕರ್ನಾಟಕ ಸರ್ಕಾರ
ಮೊಂಡಲೆ ಹಾಗೂ ಮುದ್ರಾಂಕ ಇಲಾಖೆ
Department of Stamps and Registration

ಪ್ರಮಾಣ ಪತ್ರ

1957 ರ ಕರ್ನಾಟಕ ಮುದ್ರಾಂಕ ಇಲಾಖೆಯ ಕಲಂ 10 ಎ ಅಡಿಯಲ್ಲಿಯ ಪ್ರಮಾಣ ಪತ್ರ

ಕ್ರಿ+ SESA STERLITE LTD, Mining Division, Near Megalohalli Village, Bheemasamudra / ಇವರು
20281500.00 ರೂಪಾಯಿಗಳನ್ನು ನಿಗದಿತ ಮುದ್ರಾಂಕ ಕುಲ್ಕವಾಗಿ ಪಾವತಿಸಿರುವುದನ್ನು ಪರಿಶೀಲಿಸಲಾಗಿದೆ

| ಪ್ರಕಾರ | ಮೊತ್ತ (ರೂ.) | ಪರಿಶೀಲಿಸಿದ ದಿನಾಂಕ |
|--------------------|-------------|--|
| ಇತರ ಬ್ಯಾಂಕ್ ಡಿ.ಡಿ. | 20281500.00 | ಡಿ.ಡಿ. ಸಂಖ್ಯೆ: 005722 ದಿನಾಂಕ: 11-02-2015 ರಂದು
ಎ.ಪಿ.ಎ.ಸಿ.ಎ ಬ್ಯಾಂಕ್ ಟೆಕ್ನೋಲಜಿ ಕಾರ್ಪೊರೇಷನ್
ಇಲಾಖೆಯಲ್ಲಿ |
| ಒಟ್ಟು : | 20281500.00 | |

ಸ್ಥಳ : ಮೈಸೂರು
ದಿನಾಂಕ : 13/02/2015

ಹಿರಿಯ ನಿರ್ದೇಶಕರು, ಮುದ್ರಾಂಕ ಇಲಾಖೆ
(ಮುದ್ರಾಂಕ)

Designed and Developed by C- OAC, ACTS Pune.



GOVERNMENT OF KARNATAKA

No. CL163/MMM2005

Karnataka Government Secretariat

M. S. Building

Bangalore, Dated: 03.08.2005.

From,

The Secretary to Government
(Mines, SSI & Textiles)
Commerce & Industries Department,
BANGALORE-560 001.

To,

Commissioner for Mines & Geological
Resources Development and
Director of Mines and Geology,
No.49, "Khanija Bhavan"
D.Devaraj Urs Road
BANGALORE-560 001.

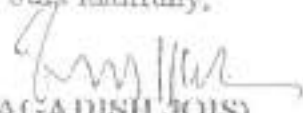
Sir,

Sub: Change of name in respect of M.L. bearing No.2236 dated
29.05.1998 from M/s.A.Narayan Mines Limited to M/s.Sesa
Goa Limited.

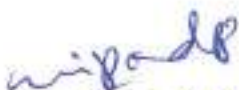
Ref: Your letter No.DMG/ML.No.2236/668 dated 17.06.2005.


I am directed to refer to your letter under reference on the subject and
to state that since M/s. A.Narayan Mines Limited is amalgamated with M/s.
Sesa Goa Limited, change in the name in respect of M.L.No.2236 from M/s.
A. Narayan Mines Limited to M/s. Sesa Goa Limited is accepted.

Yours faithfully,


(JAGADISH JOIS)

Under Secretary to Government (Mines)
Commerce & Industries Department.


SRIPAD PUJAR
QUALIFIED PERSON


B.V.R. ACHAR
QUALIFIED PERSON

GOVERNMENT OF KARNATAKA

No.CI 205 MMM 2012

Karnataka Government Secretariat,
Vikasa Soudha,
Bangalore, Dated:31.12.2013

From:

The Secretary to Government,
(Mines, SSI & Textiles),
Commerce & Industries Department,
BANGALORE-560 001.

To:

The Director,
Department of Mines & Geology,
No.49, Khanija Bhavan,
D. Devaraj Urs Road,
Bangalore - 560 001.

Sir,

Sub: Change of Name of M/s SESAGOA as M/s SESA
STERLITE - reg.Ref: (1) Your letter No.ಗಜಪೂರ್ವ/ಗಜಪೂರ್ವ/501 AML 2011/2013-14/RML-2236
Dated:12.12.2013.(2) Fresh Certificate of Incorporation, consequent upon change of
name, issued by the Registrar of Companies, Goa, Daman and
Diu.

With reference to the above mentioned subject and reference in pursuance to the issue of Certificate referred at (2) above, I am directed to state that the change of name of Sesa Goa Limited as Sesa Sterlite Limited has been perused by the Government.

You are requested to bring this to the notice of the concerned departments.

Yours faithfully,

(Jyothi R.J)

Under Secretary to Govt., (Mines)
Commerce & Industries Department
Phone No.080-22034362

Copy to:

1. The Principal Secretary to Govt., Forest, Environment & Ecology Department,
M.S. Building, Bangalore.
2. The Member Secretary, Karnataka State Pollution Control Board, Church Street,
Bangalore.

SRIPAD PUJARI

B.V.R. ACHAR



GOVERNMENT OF INDIA
MINISTRY OF CORPORATE AFFAIRS
Registrar of Companies, Goa

Company Law Bhawan, EDC Complex, Plot No. 21, Patto Panaji Goa - 403001, Goa, INDIA

Certificate of Incorporation pursuant to change of name
[Pursuant to rule 29 of the Companies (Incorporation) Rules, 2014]

Corporate Identification Number (CIN): : L13209GA1965PLC000044

I hereby certify that the name of the company has been changed from Sesa Sterlite Limited to Vedanta Limited with effect from the date of this certificate and that the company is limited by shares.

Company was originally incorporated with the name Sesa Goa Private Limited

Given under my hand at Goa this Twenty First day of April Two Thousand Fifteen.


Signature valid

Digitally signed by
VISHNU PANDURANG KATKAR
Date: 2015.04.21 16:40:12
GMT+5:30

VISHNU PANDURANG KATKAR
Registrar of Companies
Registrar of Companies
Goa

Mailing Address as per record available in Registrar of Companies office:

Vedanta Limited
SESA GHOR, 20 EDCCOMPLEX PATTO, PANJIM,
GOA - 403001,
Goa, INDIA


SRIPAD PUJAR
QUALIFIED PERSON


B.V.R. ACHAR
QUALIFIED PERSON



Date: 28/04/2015

To

The Regional Controller of Mines
Indian Bureau of Mines
29, Industrial suburb
H stage, Tumkur road, Geruguntapalya,
Yeshwanthpur, Bangalore-560022

Sir,

Sub: Change in name of Sesa Sterlite Limited to Vedanta Limited

We are pleased to inform you that consequent to the Fresh Certificate of Incorporation Pursuant to Change of Name issued by the Registrar of Companies, Goa, the name of the company has been changed from Sesa Sterlite Limited to Vedanta Limited with effect from 21st April 2015.

The copy of the said fresh Certificate of Incorporation dated 21st April referred above is attached herewith for your perusal.

The legal entity continues to be in existence and the change in name has not affected the corporate structure or any rights and obligations of the Company.

We request you to kindly take on record Change in name of 'Sesa Sterlite Limited' to 'Vedanta Limited' and do the needful.

Thanking You,

Yours Faithfully
For Vedanta Limited,

Authorized Signatory
[Signature]

Encl: 1) Certificate of Incorporation

21/5/15
21/5/15
DEPARTMENT
Bureau of Mines, Industrial
Bangalore-560022

Vedanta Limited (formerly known as Sesa Sterlite Limited, Sesa Goa Limited)
(A Navam Mines), Moghalpur Office Complex, Bhamburda P.O., Chavandega (Kumbharguda) - 751001
Fax: 91-66-2311000, 2311001, 2311002

Registered Office: Sesa Goa, 25/500 Durgam, Kotha, Ponda Taluk, Goa-401302
E-mail: corporate@vedanta.com

[Signature]
SRIPAD PUJAR
QUALIFIED PERSON

[Signature]
B.V.R. ACHAR
QUALIFIED PERSON



To,
Secretary (SSI, Mines & Textiles),
Government of Karnataka, Vikasasoudha,
Bangalore - 560 001

To,

The Director,
Department of Mines and Geology,
Khanija Bhavan, Race course road,
Bangalore

Dear Sir,

Sub: Change in name of Sesa Sterlite Limited to Vedanta Limited - Intimation of change in name under Rule 62, MCR 1960

We request your kind attention to our letter dated: 28.04.2015 submitted to your kind office regarding the intimation of change in name under Rule 62 of MCR act 1960.

Vide the said intimation we had also furnished the 'Fresh Certificate of Incorporation' issued by Registrar of Companies, Ministry of Corporate Affairs, Government of India, who is the competent authority to approve the change of name of a Company under the statutes.

As mentioned in previous communications, we reiterate that the legal entity continues to be in existence and the change in name has not affected the corporate structure or any rights and obligations of the company.

We request you to intimate the concerned departments and the Monitoring Committee regarding the name change from Sesa Sterlite Limited to Vedanta Limited.

Yours Sincerely,

For Vedanta Limited

Vinod Mishra

Head - Iron Ore Karnataka

SRIPATH PUJAR
QUALIFIED PERSON

B.V.R. ACHAR
QUALIFIED PERSON

Vedanta Limited (Formerly known as Sesa Sterlite Limited Post GoL order)
of (Iron Ore Mines), Meghaluruli Office Complex, Shreevastisoudha Post, Chikmagalur (Karnataka) - 577220
T +91 8134 238100, F + 91 8134 238170

Registered Office: Sesa Ghor, 29 EDC Complex, Palya, Palya Road - 560 001

CIN: L3270KA1985PT000504



भारत सरकार/ GOVERNMENT OF INDIA
खान मंत्रालय/ MINISTRY OF MINES
भारतीय खान ब्यूरो/ INDIAN BUREAU OF MINES
क्षेत्रीय खान नियंत्रक कार्यालय/
OFFICE OF THE REGIONAL CONTROLLER OF MINES



फैक्स: (080) 23371027 / 23373287
दूरभाष: 080-23371027 / 23375366/67
Email ID: ro.bangalore@ibm.gov.in

29, इंडस्ट्रियल सबर्ब II, स्टेट, लुमकुर रोड,
मोरमुंटापाल्वा येशवंतपुर,
बेंगलुरु -560022

सं/No.: 279/272/91/BNG 349
सेवा में/ To,
M/s. Vedanta Ltd.,
Sesa Ghot, 20 EDC Complex, Patto,
Panjim-Goa,
North Goa-403001.

दिनांक/Date: 16/08/2019

21 AUG 2019

विषय/Sub: Approval of "Modifications to the Approved Modified Mining Plan" in respect of ML No. 2677 of M/s Vedanta Ltd. over an area of 161.54 Ha (as per CEC) in Meghalahalli, Bommaravanagathihalli and Madakeripura villages, Chitradurga & Holalkere Taluk, Chitradurga District, Karnataka state, submitted for approval under rule 17(3) of MCR, 2016.

संदर्भ /Ref: Your letter No. Nil dated 19/06/2019 submitting therewith final bound copies of Modifications to the Approved Modified Mining Plan.

महोदय/Sir,

In exercise of the powers conferred by clause (b) of sub-section (2) of section 5 of the Mines and Minerals (Development & Regulation) Act, 1957 and clause (3) of Rule 17 of the Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016 read with Govt. of India order No.S.O.445 (E) dated 28.04.1987 and S.O.1857 (E) dtd.18/05/2016. I hereby approve the Modifications to the approved Mining Plan including Progressive Mine Closure Plan in respect ML No. 2677 of M/s Vedanta Ltd. over an area of 161.54 Ha (as per CEC) in Meghalahalli, Bommaravanagathihalli and Madakeripura villages, Chitradurga & Holalkere Taluk, Chitradurga District, Karnataka State. This approval is subject to the following conditions:

1. The Modification to the approved Mining Plan with Progressive Mine Closure Plan is approved without prejudice to any other laws applicable to the mine from time to time whether made by the Central Government, State Government or any other authority and without prejudice to any order or direction from any court of competent jurisdiction.
2. The proposals shown on the plates and /or given in the document is based on the lease map/Sketch submitted by the applicant /lessee and is applicable from the date of approval.
3. It is clarified that the approval of your aforesaid Modification to the approved Mining Plan with Progressive Mine Closure Plan does not in any way imply the approval of the Government in terms of any other provisions of the Mines and Minerals (Development and Regulation) Act 1957 or the Mineral (Other than Atomic and Hydro-Carbon Energy Minerals) Concession Rules, 2016 and any other laws including Forest (Conservation) Act, 1980, Environment (Protection) Act, 1986 or the rules made there under Mines Act, 1952 and Rules & Regulations made there under.
4. Indian Bureau of Mines has not undertaken verification of the mining lease boundary on the ground and does not undertake any responsibility regarding correctness of the boundaries of the leasehold shown on the ground with reference to lease map& other plans furnished by the applicant/ lessee.

.....2

SRIPATH PUJAR

B.V.R. ACHAR
QUALIFIED PERSON

Sl/No.: 279/272/91/BNG

5. At any stage, if it is observed that the information furnished, data incorporated in the document are incorrect or misrepresent facts, the approval of the document shall be revoked with immediate effect.
6. Next Financial Assurance shall be due for submission on 01.04.2022.
7. The execution of Modification to the approved Mining Plan shall be subjected to vacation of prohibitory orders / notices, if any.
8. The Approval of Modification to the approved Mining Plan is strictly confined to the proposals contained within the mining leasehold demarcated as per lease sketch given by the joint survey team constituted by the CEC and duly authenticated by the State DMG. It does not convey approval to the proposals falling outside the Mining Lease boundary.
9. The Approval of Modification to the approved Mining Plan is without prejudice to the final order of the Hon'ble Supreme Court order dtd.18/04/2013 in W.P. No. 562/2009 and interim orders passed by the Hon'ble Supreme Court from time to time in the said W.P. Nos. 25910/2009 and 26083/2009.
10. A copy of Environment Impact Assessment and Environment Management Plan as approved by the MOEF, New Delhi shall be submitted to this office along with a copy of their approval letter, within one month of the date of such approval.
11. The Environmental Monitoring Cell of the company shall continue monitoring ambient air quality, dust fall rate, water quality, soil sample analysis and noise level measurements on various stations established for the purpose both in the core zone and buffer zone as per MOEF guidelines and keeping in view IBM's circular No.3/92, season wise every year or by engaging the services of an Environment Laboratory approved by MOEF/CPCB. The data so generated shall be maintained in a bound paged register kept for the purpose and the same shall be made available to the inspecting officer on demand.
12. In case the mining lease falls within a radius of 10 kms of National Park/ sanctuary, recommendations of NBWL have to be obtained as per the Order of Hon'ble Supreme Court in I A No. 460/2004.
13. An yearly report shall be submitted to this office before 1st July of every year setting forth the extent of protective and rehabilitative works carried out as envisaged in the approved mine closure plan.
14. The Modification to the approved Mining Plan is approved for proposals contained therein and as applicable from the date of approval of the document for the mining activities to be carried out within the mining lease hold. The earlier instances of irregular mining/illegal mining, if any, shall not be regularized with this approval.
15. If anything is found to be concealed as required by the Mines Act in the contents of this document and the proposal for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect.
16. You shall maintain the boundary pillars as required under Rule 12 of Minerals (Other than Atomic & Hydro Carbons Energy Minerals) Concession Rules, 2016.
17. The Modification to the approved Mining Plan is approved for 3 years period from 2019-20 & 2021-2022 for total Mineral Reserves of **104.616** Million Tonnes of Hematitic Iron ore and **26.458** Million Tonnes of Hematitic Siliceous Iron Ore with Annual Production Capacity proposals valid for the following period with respective production capacity.

Contd.....3

सं/No.: 279/272/91/BNG

| Year | Production Capacity in Tonnes
(Iron Ore) |
|-----------------------------------|---|
| 2019-20 for the balance
period | 3035490 |
| 2020-21 | 4507770 |
| 2021-22 | 7206165 |

18. The Lessee shall obtain an Environment Clearance before financial year 2021-22 for production of 7.2 million tonnes per annum of iron ore from the competent authority as committed in modification to the approved mining Plan.
19. This approval is subject to the grant of production allocation of 7.2 million tonnes per annum of iron ore from the Central Empowered Committee.
20. The Lessee shall not produce 7.2 million tonnes per annum of iron ore prior to obtaining the necessary permission/approval from the competent authority.

भवदीय/Yours faithfully,

संलग्नक : अनुलग्नक/ One copy of the approved Modification to the
Approved Mining Plan with Progressive Mine Closure.

(जी सी मीणा/ G C Meena)

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

प्रतिलिपि सूचनार्थ/ Copy for kind information to:

1. The Director of Mines & Geology, Govt. of Karnataka, Bangalore, along with a copy of the approved Modification to the approved Mining Plan.
2. The Director of Mines Safety, Directorate General of Mines Safety, Bellary Sub- Region, 31, Infantry Road, Cantonment, Bellary – 584104.
3. The Controller of Mines (SZ), Indian Bureau of Mines, Bangalore along with soft copy of the Modified Mining plan in CD form.
4. ✓ Sri Sripad Pujar & Sri BVR Achar, Qualified Person, Rock Tech Enterprises, First Floor, Sapthagiri Enclave, College Road, Hosapete-583201, Bellary Dist, Karnataka.
5. Mine file / Guard file

Encl: As above.

(जी सी मीणा/ G C Meena)

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

CENTRAL EMPOWERED COMMITTEE

(CONSTITUTED BY THE HON'BLE SUPREME COURT OF INDIA

IN WRIT PETITION NO. 202/95 AND 171/96)

11 Floor, Chanakya Bhawan, Chanakyaपुरी, New Delhi - 11, Tel: 2161 0612 / 13, Fax: 2410 1925

F.No. 2-75/CEC/SC/2018-Pt.VII

Dated : 4th March 2020

To

The Chief Secretary
Government of Karnataka
Bangalore

Sub: Enhancement of permissible limit in respect of "Category-A" and "Category-B" mining leases and auctioned "C" Category Mine - Karnataka

Sir

Please refer to Government of Karnataka, Commerce & Industries Department letters No. E-CI 41 MMM 2019 dated 18.2.2020 on the above subject. The CEC, after examining in detail the recommendations of the Technical Committee and report of the ICFRE and keeping in view the Hon'ble Supreme Court order dated 13.4.2012 and Judgment dated 18.4.2013, decision of CEC in the meeting held on 01.12.2015 and the direction in Judgment dated 14.12.2017 of the Hon'ble Supreme Court, hereby approves the revised permissible annual production in respect of following three mining leases as per the details given below :

| Sl. No. | Name of Lessee, ML No. | Current PAP (in MMT) | Recommended PAP (in MMT) | Remarks |
|---------|--|----------------------|--------------------------|------------------------|
| 1. | M/s. Praveen Chandra, ML No. 2294 | 0.75 | 1.40 | Based on dump capacity |
| 2. | M/s. Vedanta Ltd., ML No. 2677 | 4.51 | 5.89 | Based on dump capacity |
| 3. | M/s. Sri Kumaraswamy Mineral Exports Pvt Ltd., ML No. 2141 | 1.48 | 1.64 | Based on road capacity |



SRIPAD PUJAR

QUALIFIED PERSON



B.V.R. ACHAR

QUALIFIED PERSON

| | | | | |
|----|--|------|------|-------------|
| 4. | M/s JSW Steel Ltd.,
(auctioned "C" Category
Mine, ML No. 009, Old
No. 2621) | 0.50 | 0.94 | Based on EC |
|----|--|------|------|-------------|

2. The above approval is subject to the following conditions :

- a) the State Government will ensure that the sum total of annual production from all the lessees does not exceed 28 MMT in District Bellary and 7 MMT in District Chitradurga and Tumkur.
- b) in the event it is found that the sum total of annual production is exceeding the limits mentioned at (a) above the lease wise permissible annual production of all the operating leases will automatically stand reduced on pro rata basis against the approved PAP given in this letter in such a way that the actual annual production does not exceed 28MMT in District Bellary and 7MMT in District Chitradurga and Tumkur;
- c) the State Government will ensure that all the respective lessees are having all the requisite statutory approvals; and

Yours faithfully


(Amarnatha Shetty)
Member Secretary

Copy to :

- i. The Secretary (Mines), Government of Karnataka, Bangalore
- ii. The Additional Chief Secretary, Forest, Ecology and Environment Department, Government of Karnataka.
- iii. The Principal Chief Conservator of Forests, Aranya Bhawan, Bangalore.
- iv. Chairman, Monitoring Committee, Bangalore
- v. Controller of Mines (SZ), Indian Bureau of Mines, Bangalore
- vi. Director, Mines & Geology, Government of Karnataka, Bangalore
- vii. Secretary General, Federation of Indian Mineral Industries, New Delhi
- viii. FIMI, Southern Region, Bangalore
- ix. Concerned Lessees.

F. No. 8-81/1992 - FC (Pt)
Government of India
Ministry of Environment, Forests and Climate Change
(Forest Conservation Division)

Indira Paryavaran Bhawan,
Alignaj, Jorbagh Road,
New Delhi - 110003

Date: 30th December, 2014

To

The Principal Secretary (Forests),
Government of Karnataka,
Bangalore.

Sub: Renewal of mining lease over an area of 164.79 ha(161.54 ha for renewal of mining lease and 3.25 ha for approach road) of forest land in favour of M/s Sesa Sterlite Limited (Earlier known as M/s Sesa Goa Limited), Chitradurga in Nirthadi Reserve Forest, Holalkere Range, Chitradurga, Karnataka - regarding.

Sir,

I am directed to refer to the Government of Karnataka's letter no. No. FEE 91 FFM 2012 dated 23.02.2013 on above mentioned subject seeking prior approval of the Central Government under Section-2 of the Forest (Conservation) Act, 1980. After careful consideration of the proposal by the Forest Advisory Committee constituted under section-3 of the said Act, 'in-principle' approval was granted vide this Ministry's letter of even number dated 31.07.2013 subject to fulfilment of certain conditions prescribed therein. The State Government has furnished compliance report in respect of the conditions stipulated in the 'in-principle' approval and has requested the Central Government to grant final approval.

In this connection, I am directed to say that on the basis of the compliance report furnished by the State Government, vide letter no. no. FEE 91 FFM 2012 dated 4.08.2012 'final approval' of the Central Government is hereby granted under section-2 of the Forest (Conservation) Act, 1980 for renewal of mining lease over an area of 164.79 ha of forest land(161.54 ha for renewal of mining lease and 3.25 ha for approach road) in favour of Sesa Sterlite Limited (Earlier known as M/s Sesa Goa Limited), Chitradurga in Nirthadi Reserve Forest, Holalkere Range, Chitradurga, Karnataka subject to fulfilment of the following conditions:


1. Legal status of the diverted forest land shall remain unchanged.
2. All conditions imposed by Hon'ble SC in W.P.(C No.562/2009 (Samaj Parivartana & others vs. State of Karnataka & others) including R&R Plan prepared by ICFRE, Safety Zone Plan, Other conditions imposed for re-opening of the mine, etc. shall be complied with.
3. The User Agency shall pay the additional amount of NPV, if so determined, as per the final decision of the Hon'ble Supreme Court of India.
4. Wherever possible and technically feasible, the User Agency shall undertake by involving local community, the afforestation measures in the blanks within the lease area, as well as along the roads outside the lease area diverted under this approval, in consultation with the State Forest Department at the project cost.



SRIPAD PUJAR
QUALIFIED PERSON


B.V.R. ACHAR
QUALIFIED PERSON

5. The period of diversion of the said forest land under this approval shall be for a period co-terminus with the period of the mining lease proposed to be granted under the Mines and Minerals (Development & Regulating) Act, 1957, or Rules framed there under, subject to a maximum period of 20 years.
6. User Agency either himself or through the State Forest Department shall undertake gap planting and soil & moisture conservation activities to restock and rejuvenate the degraded open forests (having crown density less than 0.40), if any, located in the area within 100m. from outer perimeter of the mining lease.
7. The User Agency shall undertake mining in a phased manner after taking due care for reclamation of the mined over area. The concurrent reclamation plan as per the approved mining plan shall be executed by the User Agency from the very first year, and an annual report on implementation thereof shall be submitted to the Nodal Officer, Forest (Conservation) Act, 1980, in the concerned State Government and the concerned Regional Office of the Ministry. If it is found from the annual report that the activities indicated in the concurrent reclamation plan are not being executed by the User Agency, the Nodal Officer or the Chief Conservator of Forests (Central) may direct that the mining activities shall remain suspended till such time, such reclamation activities are satisfactorily executed.
8. Following activities shall be undertaken by the user agency for the management of safety zone:
 - (a) User agency shall ensure demarcation of boundary of safety zone (7.5 meter strip all along the outer boundary of the mining lease area), and its protection by erecting adequate number of 4 feet high RCC boundary pillars inscribed with DGPS coordinates and deploying adequate number of watchers under the supervision of the State Forest Department.
 - (b) In case of the mining leases adjoining the habitation stretch of the boundary of the safety zone of the lease adjacent to the habitation/roads should be properly fenced by the user agency at the project cost to protect the vegetation /regeneration activities in the safety zone.
 - (c) Safety zone shall be maintained as green belt around the mining lease and to ensure dense canopy cover in the area, regeneration shall be taken in this area by the user agency at the project cost under the supervision of the State Forest Department.
 - (d) Afforestation on degraded forest land, to be selected elsewhere, measuring one and a half times the area under safety zone shall also be done by the user agency at the project cost under the supervision of the State Forest Department.
9. The User Agency shall implement the Resettlement and Rehabilitation Plan in case of displacement if any as per the Resettlement and Rehabilitation Policy of State Government in consonance with National R&R Policy, Government of India before the commencement of the project work and implementation. The said R&R Plan will be monitored by the State Government/Regional Office of MoEF&CC along with indicators for monitoring and expected observable milestones.
10. The User Agency shall undertake de-silting of the village tanks and other water bodies located within five km. from the mine lease boundary so as to mitigate the impact of siltation of such tanks/water bodies, whenever required.



11. Following activities shall be undertaken by the User Agency at the project cost:

- (a) Preparation and implementation of a plan containing appropriate mitigate measures to minimize soil erosion and choking of streams.
- (b) Planting of adequate drought hardy plant species and sowing of seeds in the appropriate area within the mining lease to arrest soil erosion.
- (c) Construction of check dams, retention/toe walls along the contour to arrest sliding down of the excavated material.
- (d) Stabilize the overburden dumps by appropriate grading/benching so as to ensure that the angles of repose/angle of waste dump at any given place is as per the R R plan approved by Hon'ble Supreme Court and its orders in WP(C) No 562 of 2009, and
- (e) Strict adherence to the prescribed top soil management.
- (f) Ample care shall be taken while reclaiming the mined area by employing suitable top soil management scheme and ensuring plantation of native species of the area.
- (g) Stabilize the overburden dumps by appropriate grading/benching so as to ensure the angle of repose at any given place is less than 28 degrees

These activities shall be undertaken in consonance with the R&R Plan prepared by the ICFRE in WP(C) No. 562/2009 & approved by CEC. by the user agency under the supervision of the State Forest Department.

- 12. The User Agency shall provide fuels preferably alternate fuels to the labourers and the staff working at the site so as to avoid any damage and pressure on the nearby forest areas.
- 13. The boundary of the diverted forest land shall be demarcated on ground at the project cost, by erecting four feet high reinforced cement concrete pillars, each inscribed with its serial number, forward and back bearing and distance from pillar to pillar in consonance with the orders / judgment passed in WP(C) No. 562/2009.
- 14. The layout plan of the proposal shall not be changed without the prior approval of the Central Government.
- 15. The forest land shall not be used for any purpose other than that specified in the proposal.
- 16. The forest land proposed to be diverted shall under no circumstances be transferred to any other agency, department or person without prior approval of the Central Government.
- 17. No damage to the flora and fauna of the adjoining area shall be caused
- 18. Any tree felling shall be done only when it is unavoidable and that too under strict supervision of the State Forest Department.



19. The user agency in consultation with the State Government shall create and maintain alternate habitat/home for the avifauna, whose nesting trees are to be cleared in this project. Birds nests artificially made out of eco-friendly material shall be used in the area, including forest area and human settlements, adjoining the forest area being diverted for the project."
20. All other conditions stipulated in the Stage-I approval for which the user agency has submitted undertakings shall be complied with.
21. The User Agency shall submit the annual self compliance report in respect of the above conditions to the State Government and to the concerned Regional Office of the Ministry regularly.
22. Any other condition that the concerned Regional Office of this Ministry may stipulate, from time to time, in the interest of conservation, protection and development of forests and wildlife.
23. The User Agency and the State Government shall ensure compliance to provisions of the all Acts, Rules, Regulations and Guidelines, for the time being in force, as applicable to the project.
24. Stage - II approval shall be subject to in principle decision of the authority in the State Government in terms of Section 8 (3) of MMDR Act-1957 that in the interest of Mineral Development, it is necessary to renew the lease.

Yours faithfully


(M. Rajkumar)

Assistant Inspector General of Forests (FC)

Copy for favour of information to:

1. The Principal Chief Conservator of Forest, Government of Karnataka, Bangalore.
2. The Addl. PCCF (Central), Regional Office Bangalore.
3. The Nodal Officer (FCA), O/o the PCCF, Government of Karnataka, Bangalore.
4. The User Agency (Sesa Sterlite limited, PB-43, Megalahalli office complex, Near Bheemasamudra Chitradurga, Karnataka-577501).
5. Monitoring Cell, FC Division, MoEF&CC, New Delhi.
6. Guard File.


(M. Rajkumar)

Assistant Inspector General of Forests (FC)



J-11015/1167/2007- IA, II (M)
Government of India
Ministry of Environment & Forests

Telefax: 011-24367257
e-mail: w.bharat@nic.in
Paryavaran Bhavan, C.G.O. Complex,
Lodi Road, New Delhi-110003.
Dated: February 05, 2009

To

M/s Sesa Goa Limited,
Sesa Ghor, 20 EDC Complex,
Patta, Panaji,
Goa - 403 001.

Sub: Expansion of A. Narrain Iron Ore Mine (ML area 163.50 ha) from 2.50 to 6.0 MTPA at village Meghalahalli, in Taluk and Distt., Chitradurga, in Karnataka - reg. Environmental Clearance.

Sir,

The undersigned is directed to refer to your letter dated 03.11.2008, received by the Processing Division in the Ministry on 10.11.2008, of the above mentioned subject. The Ministry of Environment and Forests has examined the application.

2. It has been noted that the proposal is for expansion of Iron Ore mining from 2.5 to 6.0 MTPA. The lease area is 163.50 ha, which is in forest land. Forest clearance was obtained in July, 2006. Proposed expansion will be mainly vertically. Horizontal expansion would be over an area of 2.45 ha only. Out of total lease area of 163.50 ha, only 60.45 ha will be under mining during the plan period. An area of 19.57 ha will be kept for waste dump; 2.0 ha for Top soil storage; 2.0 ha for mineral storage; 4.0 ha will be used for infrastructure; 7.0 ha for roads; 7.88 ha for green belt and 50.60 ha will be reclaimed area. The lease area has undulating terrain ranging from 790 m to 984 m above MSL. The total mineable reserve of the ore is 29.85 MT. Life of the mine at proposed rate of production will be 8 years. Method of mining will be open cast mechanised. Bhimasamudra Kere tank is located at a distance of about 6.5 km from the lease boundary. There are no rivers or perennial nallahs in the study area. There are no wildlife sanctuaries, national parks, biosphere reserves, heritage sites etc within 10 km of the lease. Ultimate depth of mining will be at 735 m above MSL. Ground water table is at 700 m above MSL. Mining will not intersect water table even in future. Peak water requirement at the mine will be 554.5 KLD which will be met from harvested rain water and ground water sources. Solid waste of around 29.50 MT will be generated. These will be used for back-filling of the worked out pits. No relocation and rehabilitation of population will be involved. Mining plan (including progressive mine closure plan) has been approved by Indian Bureau of Mines on 19.08.2008. Public hearing was held on 25.10.2008. Cost of the project will be Rs 272.0 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.

4. Based on the information submitted by you, as at Para 2 above and others, 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:


SRIPATH PUJAR
QUALIFIED PERSON


B.V.R. ACHAR
QUALIFIED PERSON

A. Specific conditions

- i) Environmental Clearance is subject to final order of the Hon'ble Supreme Court of India in the matter of Goa Foundation Vs. Union of India in Writ Petition (Civil) no. 460 of 2004, as may be applicable to this project.
- ii) Environmental clearance is subject to obtaining clearance under the Wildlife (Protection) Act, 1972 from the Competent Authority.
- iii) No two pits shall be simultaneously worked i.e. before the first pit is exhausted and reclamation work completed, no mineral bearing area shall be worked.
- iv) After exhausting the first mine pit and before starting mining operations in the next pit, reclamation and plantation works in the exhausted pit shall be completed so as to ensure that reclamation, forest cover and vegetation are visible during the first year of mining operations in the next pit. This process will follow till the last pit is exhausted. **Adequate rehabilitation of mined pit shall be completed before any new ore bearing area is worked for expansion.**
- v) Adequate buffer zone shall be maintained between two consecutive mineral bearing deposits.
- vi) Primary survey of flora and fauna shall be carried out and data shall be submitted to the Ministry **within six months** before start of expansion activity.
- vii) Conservation plan for wildlife shall be prepared in consultation with the Chief Wild Life Warden for implementation **within six months** and before start of expansion activity. The plan shall consist of in-built monitoring and evaluation mechanism. Necessary fund for implementation of the same shall be separately allocated and shall not be diverted for any other activity.
- viii) Zero waste mining concept shall be implemented either by putting up pelletisation plant or dispose off 100% low grade ores/fines to prospective buyers.
- ix) Hydro-geological study of the area shall be reviewed annually. In case adverse effect on ground water quality and quantity is observed mining shall be stopped and resumed only after mitigating steps to contain any adverse impact on ground water is implemented. Specific hydro-geological shall be conducted at the end of mining plan period of the 5th year of mining, before proceeding to undertake mining in the 6th year. The report shall be submitted to the Regional Office of the Ministry.
- x) Fugitive dust generation shall be controlled. Fugitive dust emission shall be regularly monitored at locations of nearest human habitation (including schools and other public amenities located nearest to sources of dust generation as applicable) and records submitted to the Ministry.
- xi) Shelter belt i.e. Wind Break of 30 m width and consisting of at least 5 tiers around lease facing the school / agricultural fields (if any in the vicinity) shall be raised.
- xii) A 50 m barrier of no mining zone all along both the side(s) facing the nallah (if any) passing through the lease area shall be demarcated and thick vegetation of native

species raised. Status of implementation shall be submitted to the Regional Office of the Ministry on half yearly basis.

- xii) Need based assessment for the near by villages shall be conducted to study economic measures which can help in upliftment of poor section of society. Income generating projects/tools such as 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 imparted to take up self employment and jobs.
- xiii) Land-use pattern of the nearby villages shall be studied and action plan for abatement and compensation for damage to agricultural land/ common property land (if any) in the nearby villages, due to mining activity shall be submitted to the Regional office of the Ministry within six months. Annual status of implementation of the plan and expenditure thereon shall be reported to the Regional Office of the Ministry from time to time.
- xiv) Maintenance of village roads through which transportation of ores are undertaken shall be carried out by the company regularly at its own expenses. The roads shall be black topped.
- xv) Rain water harvesting shall be undertaken to recharge the ground water source. Status of implementation shall be submitted to the Regional Office of the Ministry within six months and thereafter every year from the next consequent year.
- xvi) Measures for prevention and control of soil erosion and management of silt shall be undertaken. Protection of dumps against erosion shall be carried out with geo textile matting or other suitable material, and thick plantations of native trees and shrubs shall be carried out at the dump slopes. Dumps shall be protected by retaining walls.
- xvii) Trenches / garland drains shall be constructed at foot of dumps and coco 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 nallahs (if any) flowing through the ML area and silts arrested. De-silting at regular intervals shall be carried out.

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 de-silted at regular intervals.
- xviii) Ground water in the core zone shall be regularly monitored for contamination and depletion due to mining activity and records maintained. The monitoring data shall be submitted to the regional office of the Ministry regularly. Further, monitoring points shall be located between the mine and drainage in the direction of flow of ground water shall be set up and records maintained.
- xix) Cultivable waste land shall be identified and fodder farming or other suitable productive use of waste land shall be taken up in phased manner. Status of implementation shall be submitted to the Regional office of the Ministry

- xx) Monitoring of soil samples for assessment of transformation to acidic state or contamination due to mining activity (as applicable) shall be regularly conducted and records maintained.
- xxi) Transportation of ore shall be done by covering the trucks with tarpaulin or other suitable mechanism so that no spillage of ore / dust takes place. Transportation shall be done only during day time.
- xxii) 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 interval of five years or less) shall be conducted followed by follow up action wherever required.
- xxiii) Top soil / solid waste shall be stacked properly with proper slope and adequate safeguards and shall be utilized for backfilling (wherever applicable) for reclamation and rehabilitation of mined out area. Top soil shall be separately stacked for utilization later for reclamation and shall not be stacked along with over burden.
- xxiv) 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. 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.
- xxv) Slope of the mining bench and ultimate pit limit shall be as per the mining scheme approved by Indian Bureau of Mines.
- xxvi) Adequate plantation shall be raised in the ML area, haul roads, OB dump sites etc. 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. The density of the trees shall not be less than 2500 plants per ha. The company shall involve local people with the help of self help group for plantation programme. Details of year wise afforestation programme including rehabilitation of mined out area shall be submitted to the Regional Office of the Ministry every year.
- xxvii) 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.

- xxviii) Adequate air monitoring stations shall be installed in areas of human habitations near the mine and the results of ambient air quality shall be maintained and regularly submitted to the Regional Office of the Ministry.
- xxix) The waste water from the mine shall be treated to conform to the prescribe standards before discharging in to the natural stream. The discharged water shall be regularly monitored and report submitted to the Ministry of Environment & Forests, Central Pollution Control Board and the State Pollution Control Board.
- xxx) 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. Transportation of ore shall be done only during day time. 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. The trucks transporting ore shall not pass through wild life sanctuary.
- xxxi) Prior permission from the Competent Authority shall be obtained for extraction of ground water, if any.
- xxxii) Action plan with respect to suggestions/improvements and recommendations made during public consultation/hearing shall be submitted to the Ministry and the State Govt within six months.
- xxxiii) 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 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) 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.
- (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, NO_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.
- (v) Data on ambient air quality (RPM, SPM, SO₂, NO_x) 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.

- (v) 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 / muffs.
- (vi) 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 shall be installed before discharge of workshop effluents.
- (vii) 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.
- (viii) Provision shall be made for the housing the labourers 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.
- (ix) 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.
- (x) The project authorities shall inform to the Regional Office of the Ministry located at Bangalore 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 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 Bangalore.
- (xii) The project authorities shall inform to the Regional Office located at Bangalore 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 Regional Office of the Ministry located at Bangalore 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.
- (xiv) 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.
- (xv) State Pollution Control Board shall display a copy of the clearance letter at the Regional office, District Industry Centre and Collector's office / Tehsildar's Office for 30 days.
- (xvi) 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 in 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 Any appeal against this environmental clearance shall lie with the National Environment Appellate Authority, if preferred, within a period of 30 days as prescribed under Section 11 of the National Environment Appellate Authority Act, 1997.

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.

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 Karnataka, Bangalore.
3. Secretary, Department of Mines and Geology, Government of Karnataka, Bangalore.
4. Secretary, Department of Forests, Government of Karnataka, Bangalore.
5. Chief Conservator of Forests, Regional Office (SZ), Kendriya Sadan, 4th Floor E&F, Wings 17th Main Road, 1 Block, Koramangala, Bangalore-560 034.
6. Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-Cum-Office Complex, East Arjun Nagar, New Delhi-110 032.
7. Chairman, Karnataka State Pollution Control Board, Parisara Bhawan, 4th & 5th Floor, 49, Church Street, Bangalore - 560 001.
8. Member Secretary, Central Ground Water Authority, A2, W - 3, Curzon Road Barracks, K.G. Marg, New Delhi-110001.
9. Controller General, Indian Bureau of Mines, Indira Bhawan, Civil Lines, Nagpur- 440 001.
10. District Collector, Chitradurga, Government of Karnataka.
11. E1 Division, Ministry of Environment & Forests, Paryavaran Bhawan, New Delhi.
12. Monitoring File.
13. Guard File.
14. Record File.

(W. Bharat Singh)
Deputy Director



CERTIFIED TRUE COPY OF THE MINUTES OF THE BOARD MEETING OF VEDANTA LIMITED (FORMERLY KNOWN AS SESA STERLITE LIMITED) ('COMPANY') HELD ON OCTOBER 28, 2016


To appoint Mr. Sauvick Mazumdar, Chief Operating Officer – Iron Ore Business of the Company as the Owner of Mines under Mines Act, 1952 in place of Mr. DD Jalan.

"RESOLVED THAT that in supersession of Resolutions passed earlier in this regard, Mr. Sauvick Mazumdar, Chief Operating Officer – Iron Ore Business, be and is hereby appointed as the Owner of Mines with immediate effect in place of Mr. DD Jalan under Section 76 of Mines Act, 1952, for various Mining Leases in the name of the Company, as follows:

| <u>Name of Mining Lease</u> | <u>T.C. No.</u> |
|---------------------------------|-----------------|
| Xirvi Culna | 39 of 1955 |
| Canca Galla Tolop | 3 of 1954 |
| Maindvilicho Sodo | 69 of 1951 |
| Gurmel | 70 of 1952 |
| Orasso Dongor | 76 of 1952 |
| Millem Dongor | 38 of 1955 |
| Cajumol | 26 of 1955 |
| Pirna E Nadora | 32 of 1955 |
| Maretta Sodo | 6 of 1955 |
| Macarxendo | 9 of 1949 |
| Gadia Sodo | 126 of 1953 |
| Botvadeacho Dongor | 28 of 1951 |
| Chireanchim Ambescodil Dongurli | 10 of 1949 |
| A. Narrain Mines, Chitradurga | 2677 (RML 2236) |

RESOLVED FURTHER THAT the said Owner be authorized to sign application forms, notices, etc. as may be required for compliance under the Mining Laws, take all necessary steps in connection with mining operations and to appoint an agent."

For Vedanta Limited


Tarun Jain
 Whole-Time Director

Vedanta Limited (Formerly Sesa Sterlite Limited)
 DLF Atrra, Jacaranda Marg, DLF City Phase II, Gurgaon – 122 002, Haryana
 T +91-124 4593000 www.vedantalimited.com

Registered Office: Sesa Ghor, 20 EDC Complex, Patto, Panaji (Goa) - 403 001
 CIN: L13208GA1965PLC000044


SRIKANT PUJAR
 QUALIFIED PERSON


B.V.R. ACHAR
 QUALIFIED PERSON

List of Directors as on 29.04.2015

| SR. NO. | DIRECTOR'S NAME | DESIGNATION | PAN NO. | TEL. NO. | RESIDENTIAL ADDRESS |
|---------|---------------------|--|------------|----------------------------------|---|
| 1 | Mr. Navin Agarwal | Executive Chairman | ACTPA4140J | 022
66461000
(Office no.) | Vedanta, 75 Nehru Road, Vile Parle (E), Mumbai- 400099 |
| 2 | Mr. Naresh Chandra | Independent Non-Executive Director | AAAPC1072G | 011-
26897295
(Res.) | C-4/4053, Vasant Kunj, New Delhi - 110070 |
| 3 | Mr. Ravi Kaht | Independent Non-Executive Director | AAIPK7999L | 022-
22041123
(Res.) | 114 B NCPA Apartments, 11 th floor, NCPA Complex, Nariman Point, Mumbai-400 021 |
| 4 | Ms. Lalita D. Gupte | Independent Non-Executive Director | AAEPG5696C | 9821069170 | Mhaskar Building, 153 C Matunga, Sir Bhalchandra Road, (Opposite Ruia College), Mumbai - 400 019, |
| 5 | Ms. Anuradha Dutt | Independent Non-Executive Director | AAGPD5393M | 011 -
47194400 | 78, Golf Links, New Delhi - 110 002. |
| 6 | Mr. Tarun Jain | Wholetime Director | AACPJ9089J | 022
66461000
(Office no.) | Vedanta, 75 Nehru Road, Vile Parle (E), Mumbai- 400099. |
| 7 | Mr. Din Dayal Jalan | Wholetime Director and Chief Financial Officer | ABHPJ9120E | 011-
49166100
(Office no.) | DLF Atria, Jacaranda Marg, DLF City Phase II, Gurgaon- 122 002, Haryana |
| 8 | Mr. Thomas Albanese | Wholetime Director and Chief Executive Officer | BNCPA8714K | 011-
49166100
(Office no.) | DLF Atria, Jacaranda Marg, DLF City Phase II, Gurgaon- 122 002, Haryana |

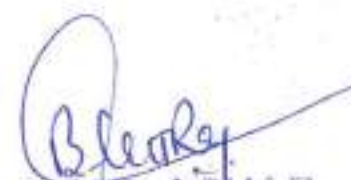
For VEDANTA LIMITED


RAJIV CHOUBEY
 COMPANY SECRETARY & AVP- LEGAL

29.04.2015


SRI PAD PUJAR
 QUALIFIED PERSON

Vedanta Limited (Formerly known as Sesa Sterile Limited/Sesa Goa Limited)
 Registered Office: Sesa Ghor, 20 EDC Complex, Patto, Panaji (Goa) - 403 001
 T +91-832 246 0600 | F +91-832 246 0690 | Website: www.sesasterile.com
 CIN: L13209GA1965PLC000344


B.V.R. ACHAR
 QUALIFIED PERSON

ML no. 2677

Photo ID of Nominated Owner



भारतीय विशिष्ट पहचान प्राधिकरण
भारत सरकार
Unique Identification Authority of India
Government of India

Enrollment No 1116/0011590901

To
 Saurabh Mazumdar
 C/O: Venkatesh Prabhakar Dasa
 Flat No B-202, Landscape Park Park
 Canal
 Opp Kala Academy
 Panaji
 Panaji, Taluqa North Goa
 Goa 403001
 0785065524

Net 2853 / 20D / 110506 / 110530 / F



1116/0011590901



आपका आधार क्रमांक / Your Aadhaar No. :

2178 0914 5566**आधार - आम आदमी का अधिकार**

भारत सरकार
Government of India



Saurabh Mazumdar
 DOB 12/08/1971
 Male

**2178 0914 5566****आधार - आम आदमी का अधिकार****सूचना**

- आधार पहचान का प्रमाण है, नागरिकता का नहीं।
- आधार का प्रमाण अंतर्राष्ट्रीय प्रमाणिकरण द्वारा प्राप्त करें।

INFORMATION

- Aadhaar is proof of identity, not of citizenship.
- To establish identity, authenticate online.

- आधार देश भर में लागू है।

- आधार अतिथि में मावकी और गैर-सरकारी सेवाओं का लाभ उठाने में उपयोगी होगा।

- Aadhaar is valid throughout the country.

- Aadhaar will be helpful in availing Government and Non-Government services in future.



भारतीय विशिष्ट पहचान प्राधिकरण
Unique Identification Authority of India

Address: C/O: Venkatesh Prabhakar Dasa
 Flat No B-202, Landscape Park
 Park, Canal, Opp Kala Academy,
 Panaji, Panaji, North Goa, Taluqa
 Goa, 403001

2178 0914 5566

SRIPAD PUJAR
QUALIFIED PERSON

B.V.R. ACHARYA
QUALIFIED PERSON



We, the Chancellor, Vice-Chancellor
and Members of the Senate of
the Gulbarga University

ಶ್ರೀ ಶ್ರೀ

Shri Pujar Srihad

Having been nominated for the Degree of Master of
Science (Mineral Exploration) and assigned
to have passed the examination (May 1988)
in the First Class the Degree of

MASTER OF SCIENCE

(Mineral Exploration)

has been conferred on him/her at Gulbarga on the
Fourth day of the month of March in the year
One thousand nine hundred and eighty eight

In Testimony whereof we set the seal of this said
University and the signature of the Vice-Chancellor

ಶ್ರೀ ಶ್ರೀ

Vice-Chancellor

ಗುಲಬರ್ಗಾ ವಿಶ್ವವಿದ್ಯಾಲಯದ ಕುಲಾಧಿಪತಿ,

ಕುಲಪತಿ ಹಾಗೂ ಸೆನೆಟ್ ಸದಸ್ಯರಾದ ನಾವು

ಶ್ರೀ ಪುಜಾರ್ ಶ್ರೀಹದ್

ಅವರು ಪದವಿ ಅರ್ಜಿ ಸಲ್ಲಿಸಿ, (ಖನಿಜ ಅನ್ವೇಷಣಾಶಾಸ್ತ್ರ)
ಪದವಿ ಪರೀಕ್ಷೆಯಲ್ಲಿ (ಮೇ 1988) ಪ್ರಥಮ ವರ್ಗದಲ್ಲಿ
ಉತ್ತೀರ್ಣರಾದುದರಿಂದ ಅವರಿಗೆ

ಮಾಸ್ಟರ್ ಆಫ್ ಸಯನ್ಸ್

(ಖನಿಜ ಅನ್ವೇಷಣಾಶಾಸ್ತ್ರ)

ಪದವಿಯನ್ನು ಗುಲಬರ್ಗಾದಲ್ಲಿ ಒಂದು ಸಾವಿರದ ಒಂಬತ್ತು
ನೂರ ಎಂಭತ್ತಾರನೆಯ ಮಾರ್ಚ್ ತಾರೀಖಿನಲ್ಲಿ ನೀಡಿದ್ದೇವೆ.

ಈ ವಿಶ್ವವಿದ್ಯಾಲಯದ ಮುದ್ರೆ, ಹುತ್ತು, ಕುಲಪತಿಯ
ಮುದ್ದುಗಳಿಂದ ಇದನ್ನು ಪ್ರಮಾಣೀಕರಿಸಲಾಗಿದೆ.

SRIPAD PUJAR

B.V.R. ACHAR

QUALIFIED PERSON QUALIFIED PERSON



Tungabhadra Minerals Ltd.,

ADMINISTRATIVE OFFICE

TAPAKHAR-592 110,
BELLARY DIST.
KARNATAKA STATE

Tele: 0817-224 TMLIN
0845-9556
Cable: AGGREGATES, SANDUR
3175
Phone: 3153 TORANAGALLU
3162

TMT/ 362 /93-94

28th June, 1993.

SERVICE CERTIFICATE

This is to certify that Mr. SRIPAD PUJAR has been working in our Organisation in the capacity of Junior Geologist since 3rd August, 1989. He is sincere and hard working. To the best of our knowledge his conduct and character are found to be good.

We wish him best of luck in his

endeavour.

FOR TUNGABHADRA MINERALS LTD.,

[Signature]

ASST. ADMINISTRATIVE OFFICER.

TELEX: 388-252 TPL IN

TEL. ADD: TIMBLO MARGAO

TIMBLO PRIVATE LIMITED

PHONE: 3188 15 LINES

Registered Office
KADAR HANZIL

POST BOX NO. 34

MARGAO - GOA

403 601

19th July, 1989.

TO WHOMSOEVER IT MAY CONCERN

THIS IS TO CERTIFY that Shri P. Shripad was in our employment as a Trainee Geologist at our Head Office Margao Goa, from 3.2.1987 to 31.1.1988 and as a Jr. Geologist from 1.2.88 to 18.7.1989.

During the period of his service we have found him to be diligent, honest and hard working and his services were found to be satisfactory.

He left our service of his own accord for better prospects.

We wish him a bright future career.

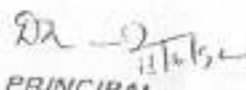
This certificate is issued at his request.

TIMBLO PRIVATE LIMITED



(SATISH TIMBLO)
Director.



Dr. 
PRINCIPAL

S.E.S. Arts Science & Commerce College
SANDUR-583 119.



Vijayanagara Srikrishnadevaraya University, Ballari
Director, Post Graduate Centre, Nandihalli-sandur

Ph. No(Off) : 08395-278236
: 08395-278226

e mail:directorpgcn@gmail.com
web :www.vskub.ac.in

No:VSKUPGCN/ADM/2017-18/379

Date: 23.06.2017

To whomsoever it may concern

This is to certify that **Shri Sripad Pujar** has been awarded Master of Science (Mineral Exploration) during May 1985 from the PG Centre, Nandihalli under Gulbarga University, Karnataka, which is recognised under University Grants Commission.

Currently, this PG Centre, Nandihalli comes under the jurisdiction of Vijayanagara Srikrishnadevaraya University, Ballari, which is also recognised under University Grants Commission.

This is certified that the Master of Science (Mineral Exploration) is equivalent to Master of Science in Applied Geology.

Further, the Master of Science in Mineral Exploration started in the year 1976 was renamed as Master of Science in Applied Geology in 1993 with same curriculum.


DIRECTOR
Vijayanagara Srikrishnadevaraya University
PG-Centre, Nandihalli-Sandur



मिनरल एक्सप्लोरेशन कॉर्पोरेशन लिमिटेड
(भारत सरकार का उद्यम)
Mineral Exploration Corporation Limited
(A Government of India Enterprise)

पंजीकृत कार्यालय : डॉ. बाबासाहेब आंबेडकर भवन, हाईलैंड ड्राइव रोड, सेमिनरी हिल, नागपुर - 440 004.
Regd. Office : Dr. Babasaheb Ambedkar Bhavan, Highland Drive Road, Seminary Hills, Nagpur-440 004.
Telephone : 510310, 510314, 510317, 510419, 510441, 510442, 510443, 510411
Fax : 291-0712-510132, 510548 E-mail : mecl@nagpur.dot.net.in, web@www.meclindia.com

No: SMPA/Adm/Mier/2000/5469

Dated: 6-11-2001

SERVICE CERTIFICATE

This is to certify that Shri B.V.R. Achar joined this Organisation as Officer Trainee(Geology) on 28.3.1990 and he resigned from the services of this Corporation with effect from 30.9.2001. At the time of leaving the services he was holding the post of Senior Geologist in the scale of pay of Rs.1900-200-1800-215-5275/- with a basic pay of Rs.6025/- per month.


(T.K. PATIL)

SENIOR MANAGER (PERS. & ADMN.)-HOD.

To

Shri B.V.R. Achar,
Ex-St. Geologist,
MECL, NAGPUR.

Through : The Project Manager, MECL, Harpur Project.



Vijayanagara Srikrishnadevaraya University, Ballari
Director, Post Graduate Centre, Nandihalli-sandur

Ph. No(Off) : 08395-278236
: 08395-278226

e mail:directorpgcn@gmail.com
web :www.vskub.ac.in

No:VSKUPGCN/ADM/2017-18/378

Date: 23.06.2017

To whomsoever it may concern

This is to certify that Shri Vajirajendrachar B. has been awarded Master of Science (Mineral Exploration) during May 1988 from the PG Centre, Nandihalli under Gulbarga University, Karnataka, which is recognised under University Grants Commission.

Currently, this PG Centre, Nandihalli comes under the jurisdiction of Vijayanagara SriKrishnadevaraya University, Ballari, which is also recognised under University Grants Commission.

This is certified that the Master of Science (Mineral Exploration) is equivalent to Master of Science in Applied Geology.

Further, the Master of Science in Mineral Exploration started in the year 1976 was renamed as Master of Science in Applied Geology in 1993 with same curriculum.


DIRECTOR
Vijayanagara Srikrishnadevaraya University
PG Centre, Nandihalli-Sandur

0/2

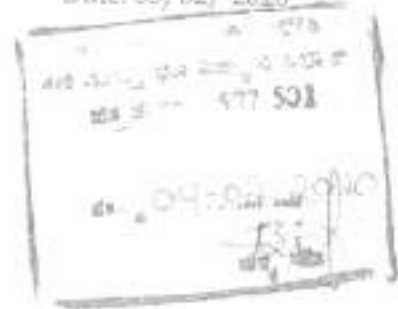
ANNEXURE 15



sesa goa iron ore

To,
The Regional Controller of Mines
Indian Bureau of Mines
Southern Region
Bangalore-560022

Date: 03/02/2020



Dear Sir,

M.C.D.R. RETURNS

Sub: Submission of notice of boreholes in **Form-I** under rule no 47 (a) MCDR-2017 of M/s.
Vedanta Limited, M.L. No: 2677

We are herewith enclosing here with the notice of boreholes in **Form-I** in respect of M/s.
Vedanta Limited, M.L. No: 2677.

Kindly acknowledge the receipt of the same.

Thanking you,

Yours faithfully,

For VEDANTA LIMITED,

For Vedanta Limited

SRIAD FUJAR
QUALIFIED PERSON

Authorised Signatory
(Mining Engineer)

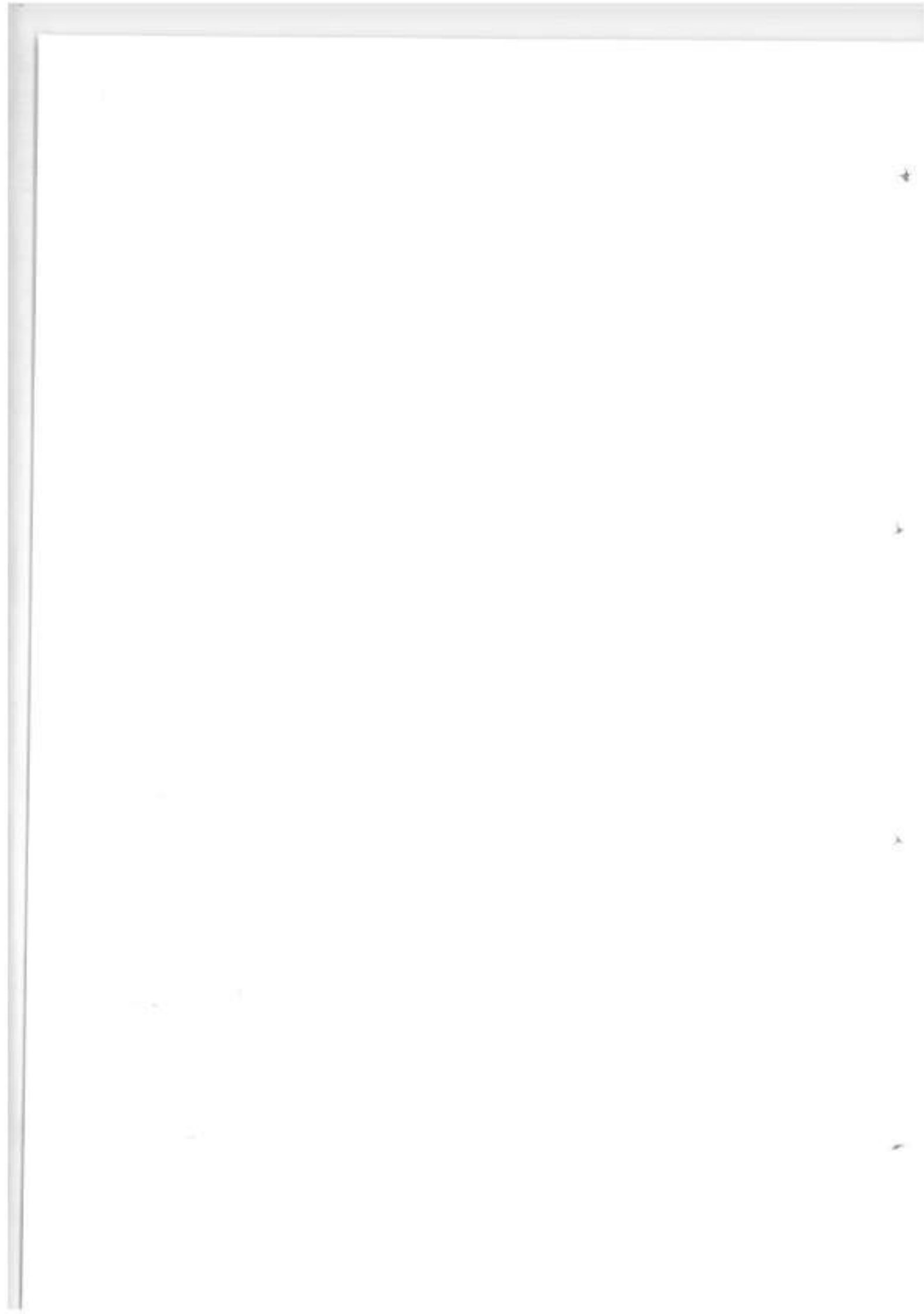
Cc: To

1. The Controller General of Mines, DM, Nagpur
2. The Controller Of Mines, DM, Bangalore
3. The Deputy Director, DMG, Channarayana

B.V.R. ACHAR
QUALIFIED PERSON

VEDANTA LIMITED
Bhilai Steel Plant, Bhilai
Department of Mining & Metallurgy, Bhilai Steel Plant
Bhilai, Chhattisgarh-491 004

For and on behalf of Vedanta Limited, Bhilai Steel Plant, Bhilai, Chhattisgarh-491 004
For and on behalf of Vedanta Limited, Bhilai Steel Plant, Bhilai, Chhattisgarh-491 004





sesa goa iron ore

ole

To,

Date: 07/10/2017

The Dy. Controller of Mines
Indian Bureau of Mines
Yeswanthpur,
Bangalore-560022

Subject: Our submission for violations on provisions of MCDR-2017 in respect of A Narrain Iron ore mines (M. L. No 2677) over an extent of area of 160.59Ha in chitradurga district, Karnataka State.

Ref: Your good office letter no KNT/CTD/FE/4/BNG/Vol-III/1756 Dt. 31st August 2017

Dear Sir,

Rule 11(1) Rule 11(1) The Modification to the approved Mining was approved vide letter No. 279/272/91/BNG/1111 dated 10/05/2016 for the period 2016-17. The deviations observed in mining operations vis-a-vis approved document are given below:

- (1) *It was proposed to form/ develop benches of 7m height in both the blocks, whereas the height of benches observed 8m to 9m against the proposed height of 7m at places*

Submission:

As proposed to develop benches of 7m height for safer operations and safety berms of 1.5 to 2 meters are provided over and above bench height at edge of the benches. However actual height of the benches are kept at 7 meters only.

- (2) *It was proposed to dump waste in dump no.3, whereas it is observed that part of waste dumped in dump no.4.*

Submission:

We have dumped waste only in dump number 3 as per approved mining plan. Waste dumping is not started in DUMP number 4.

- Rule 13(2)** *The benches in overburden have not been sufficiently kept in advance. The width of benches observed less than the height at several places*

Submission:

All working benches in overburden are kept with average width of 10 meters, as per approved mining plan.

- Rule 35(2)** *A high resolution satellite images obtained from CARTOSAT-2 satellite LISS-IV sensor on the scale of cadastral maps, covering the mining lease and an area of two kilometres from the lease boundary has not been submitted as required under the rule.*

VEDANTA LIMITED
Sesa Goa Iron Ore, Karnataka
Mishelole Office Complex, Heersamandri, Chitradurga, Karnataka - 577 501
T 081-442561060 www.vedantaindia.com

Registered Office: Vedanta Limited, 1st Floor, 'C' wing, Unit 501, Enterprise Avenue, 3rd Floor, Chokkikul, Arakkonam (Dist. Chennai) 600 090, Tamil Nadu
CIN: L23299GJ1995PLC291199

[Signature]
SRIPAD PUJAR
QUALIFIED PERSON

[Signature]
B.V.R. ACHAR
QUALIFIED PERSON

Submission:

We were in continuous discussion with empired agency and it has been told that the CARTOSAT-2 satellite image for a particular day cannot be generated (date 31.03.2017). However the LISS-IV sensor will be submitted to your office by 30th Oct 2017. For the CARTOSAT-2 image we have send the request to the NRSC for acquisition of high-resolution of cloud free satellite image will submit the same to your office as early as possible.

45(5) a (1)

The production for the month of June, 2017 is reported as 254,261 Tunes, against the target of 199,833t us per 12 months period. Further, the processed ore is reported as 324,675t, which is more than the production figure indicated above.

Submission:

There is no restriction on monthly production. Total ROM production achieved till June 2017 is 12,30,078 MT which is well within CEC approved annual production capacity. Processed ore reported for the month is 251,264 MT, which is less than ROM production.

Rule
45(5)(b)(i)

In annual return, part-I, sl.no 12(ii), the lease area utilization at the end of the year, the area reclaimed/rehabilitated given as 23.24 ha, but the same is not found in ML area. Besides, the same area also not brought out in the approved mining plan document, if it is under taken in the ML area, which is not appropriate and correct. This need to be updated and corrected suitably in the annual returns and wherever is applicable.

Submission:

In annual return, part-I, sl.no 12(ii) the lease area utilization at the end of the year, it is shown under reclaimed/rehabilitated as 23.24 ha. Since plantation area is above the dump area so these area can be considered in waste dump area only instead of reclaimed/rehabilitated area. In subsequent annual and other returns these will be corrected.

We hope that above mentioned reasons will suffice. We will produce further documents if required. In view of the compliance mentioned above we request you to please withdraw the said violation and oblige.

Thanking you,
Form Vedanta Ltd


Vijayanand Chakrasali
Mines Manager



Copy for Information to:-

1. The controller of Mines (SZ), IBM, Bangalore
2. The Director, Department of Mines and Geology, Govt. of Karnataka, Khanija Bhavan, Race Course Road, Bangalore 560001.

Received on
24 Aug 2018

GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES
OFFICE OF THE REGIONAL CONTROLLER OF MINES



Tel No 080 23371027
Fax No 080 23371287
Email ID: rc-bangalore@ibm.gov.in

29, Industrial Suburb, H Stage
Tumkur Road, Gostangatapalya
Yeshwantpur, Bangalore-560 022

No. KNT/CDT/IBNG/Vol-IV/1538

Dated: 13/8/2018

To
✓ Shri. Sanvik Mazumdar, Nominated Owner
M/s Vedanta Limited
Sesa Ghur, 20 IDC Complex,
Patto Panjiri, Goa,
Goa: 403 001

Subject: Violation of provisions of MCDR 2017 in respect of A Narran (Vedanta) Iron Ore Mine (M.L. No. 2677) of M/s Vedanta Ltd., over an extent of 161.54 ha (as per CEC) in Megalimalli Village, Holalkere Taluk, Chitradurga district, Karnataka State. Reg.

Sir,


The following provisions of Mineral Conservation and Development Rules 2017 were found violated in your above mine during the inspection on 30/05/2018 by undersigned in the presence of Mines Manager S/Shri Y.M. Mahesh Mining Engineer, Somdekkhar Dholekundi Geologist.

| | |
|------------|--|
| Rule 11(1) | <p>It was proposed in the Modification & Review of Mining Plan approved vide letter No 279/272/91/BNG/24 to 29 dated 23/3/2018 for the period 2018-19 to 2021-22. The deviations observed in mining operations vis-a-vis approved document are given below:</p> <p>The proposed development & production as per the year 2017-18 & 2018-19, given in plan & sections of plate No. (III/a & b), to develop the benches on the southern end of the south block with bench height of 7m & width of more than 3m, but on the day of inspection, it was observed and found that the benches towards SSW side found all the benches have been broken and collapsed without any systematic benches as shown in the plate, thereby caused working in contrary to the approved document. Thus the violation of unsystematic workings has been observed.</p> |
|------------|--|

02. In this connection, it is brought to your notice that the above violations constitute an offence punishable under Rule 62 of Mineral Conservation and Development Rules, 2017.

03. You are, therefore, advised to rectify the above violations immediately and intimate the position to this office within 45 (Forty Five) days from the date of issue of this letter.

Yours faithfully,


(C. Parameshwaran)
Deputy Controller of Mines
Indian Bureau of Mines

Date: 04.09. 2018

To,

The Regional Controller of Mines
Indian Bureau of Mines
Southern Region
Bangalore-560022

Sub: Our submission for violation on provision of MCDR 2017 in respect of A.Narain Iron Ore Mine (M.L. No. 2677) over an extent of 161.54 Ha in Chitradurga district, Karnataka State.

Ref: Your good office letter No: KNT/CTD/FE-4/BNG/Vol-IV/1538 dated 13/08/2018.

Dear Sir,

Rule 11(1) It was proposed in the Modification & review of Mining Plan approved vide letter No. 219/272/91/BNG/24 dated 23/03/2018 for the period 2018-19 to 2021-22. The deviations observed in mining operations vis-à-vis approved document are given below:

- (1) *The proposed development and production as per the year 2017-18 and 2018-19, given in plan 7 sections of plate NO.(III/a & b), to develop the benches on the southern end of the south block with bench height of 7m & width of more than 3m, but on the day of inspection, it was observed and found that the benches towards SSIP side found all the benches have been broken and collapsed without any systematic benches as shown in the plate thereby ceased working in contrary to the approved document. Thus the violation of unsystematic working has been observed.*

GENERAL NOTE

Vedanta Iron Ore (India) Limited, Bangalore, Karnataka - 560022. Tel: 080-2625 4225 Fax: 080-2625 4226 Email: info@vedanta.comVedanta Iron Ore (India) Limited, Sesa Iron Ore Mine, KNT/CTD/FE-4/BNG/Vol-IV/1538 dated 13/08/2018. Bangalore, Karnataka - 560022. Tel: 080-2625 4225 Fax: 080-2625 4226 Email: info@vedanta.com



sesa god iron ore

Submission

Since SEW side of pit in our major working area, development is concentrated in almost all the benches which include blasting to top hard layer to further and excavation in soft shale strata. Therefore during your field visit benches in all these area were appearing in irregular shape. We have developed this area in systematic manner by maintaining all working bench height of 7 m and width of area that 5 m or gives in our approved Mining Plan for the year 2017-18 and 2018-19. We have attached recent photographs of the mine area showing systematic development for your ready reference (attached as Annexure - 1).

We hereby request you to please withdraw the said violation and orders.

Thanking you,

Yours faithfully,

For VEDANTA LIMITED,
For VEDANTA LIMITED

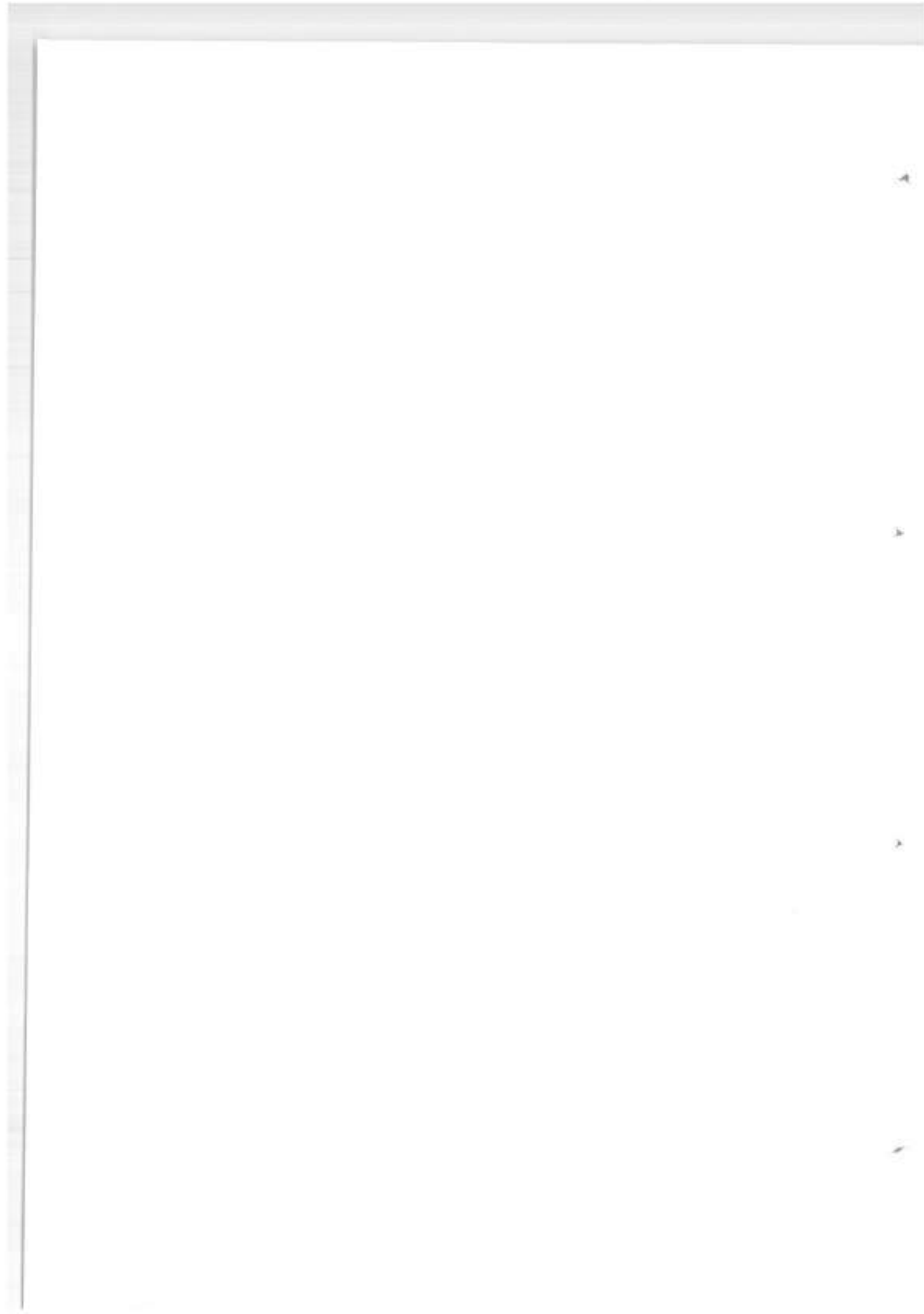
Director - Mining

(Miner Manager)

ANNEXURE - 1

The photographs are attached herewith for your reference. (10/01/2018)

High resolution photographs of the mine area showing systematic development for your ready reference (attached as Annexure - 1).





भारत सरकार / GOVERNMENT OF INDIA
खन मंत्रालय / MINISTRY OF MINES
भारतीय खान ब्यूरो / INDIAN BUREAU OF MINES
क्षेत्रीय खान नियंत्रक कार्यालय / OFFICE OF THE REGIONAL
CONTROLLER OF MINES

फैक्स: (080) 23371027 / 23373287
दूरभाष: 080-23371027 / 23375366/67
Email ID: ro_bangalore@ibm.gov.in

29, इंडस्ट्रियल सबर्बे II स्टेशन, तुमकूर रोड,
गोवर्गुटापाल्वा पैदावंतपुर,
बैंगलूर - 560022

सं. Letter No: KNT/CTD/Fe-4/BNG/Vol-IV

दिनांक: 29.07.2019

30 JUL 2019

सेवा में

✓ Shri. Saavick Mazumdar,
Nominated Owner,
Sesa Ghor, 20 EDC Complex,
Patto Panjim Goa,
Goa-403001

विषय/Sub: Violation of provisions of Mineral Conservation and Development Rules, 2017 in respect of your of Vedanta Limited (ML-2677) over an area of 160.39 Ha located in Chitradurga district of Karnataka State.

महोदय/Sir,

The following provisions of the Mineral Conservation & Development Rules 2017 were found violated in your above mine during the inspection carried out by the undersigned along with Shri K Chatterjee, JMG in presence of, Shri. Padmaraja T. - Mining Engineer and Shri. Somekhar Dhodkunde - Geologist on 05.07.2019.


| Rule | Nature of violations observed |
|-------|--|
| 11(1) | <p>Modified RMP with PMCP was approved vide letter no.279/272/91/BNG/24 dated 23.03.2018 for a period of 2018-19 to 2021-2022. The deviation observed in mining operation vis-a-vis approved document are given below</p> <p>i) It was observed that the production & development plan was deviated from the proposal towards Southern side in between Section Line 3A-3A' to 5A-5A'.</p> <p>ii) It was noticed that siliceous ore had not been worked out in between section line section 7A-7A' to 9A-9A', thus resulting in no generation of mineral reject and lowering of stripping ratio.</p> <p>iii) Retaining wall was not constructed as per the approved document against the proposal of 409 Mts.</p> |

| | |
|-------|---|
| 26(2) | Yearly report on PMCP setting forth the extent of protective and rehabilitative works carried out as per the approved Progressive Mine Closure Plan has not been sent till date. |
| 45(7) | <p>Following deficiencies were observed in the Annual Returns submitted:</p> <p>i) As per the approved document no area is considered as fully reclaimed and rehabilitated, where as 23.24 Ha is shown in Annual Returns. (ref Part I of the annual returns)</p> <p>ii) Ex mine price is given for ores even though there is no dispatch of lumps & fines. (ref Part VI of the annual returns)</p> <p>iii) The Royalty, DMF & NMET may be given separately for calculating the cost of production. (ref Part VII of the annual returns)</p> |

52. In this connection it is brought to your notice that the above violations constitute an offence punishable under Rule 62 of MCDR, 2017. Further, the violation of Rule 11(1) may also attract provisions of Rule 11(2) of MCDR, 2017 regarding suspension of mining operations till the compliance of violations.

53. You are advised to rectify/explain the above violations immediately and intimate the position to this office within 45 (Forty Five) days from the date of issue of this letter.

भवदीय/Yours faithfully,


(अरुण कुमार)
उप खान निरीक्षक
भारतीय खान ब्यूरो

प्रतिलिपि सूचनाएँ/Copy for kind information to:

1. The Controller of Mines (SZ), Indian Bureau of Mines, Bangalore.
2. The Director, Department of Mining & Geology, No.49, Khairatnagar, R.C. Road, Bangalore-560 001

उप खान निरीक्षक
भारतीय खान ब्यूरो



vedanta

transforming elements

sesa goa iron ore

Date: 07.09.2019

The Regional Controller of Mines
Indian Bureau of Mines
Southern Region
Bangalore-560022

Subject: Our submission for violations on provisions of MCDR-2017 in respect of A Narrain Iron ore mines (M. L. No 2677) over an extent of area of 160.59Ha in Chitradurga district, Karnataka State.

Ref: Your good office letter no KNT/CTD-FE-4 BNG/Vol-IV/157 Dt. 30th July 2019

Dear Sir,

Rule 11(1) *Modified RMP with PMCP was approved vide letter no.279/272/91/BMG/24 dated 23.03.2018 for a period of 2018-19 to 2021-22. The deviation observed in mining operations vis a vis approved document are given below:*

- i) *It was observed that the production and development plan was deviated from the proposal towards southern side in between section line 3A-3A' to 5A-5A'.*

Submission:

The modification in proposals of production & development work at sections 3A-3A' to 5A-5A' for the year 2019-20 is made in latest modified approved mining plan (letter no 279/272/91/ BNG dated 19.8.2019).

- ii) *It was noticed that siliceous ore had not been worked out in between section line section 7A-7A' to 9A-9A', thus resulting in no generation of mineral reject and lowering of stripping ratio.*

Submission:

The proposals of production & development work at sections 7A-7A' to 9A-9A' is made in latest modified approved mining plan (letter no 279/272/91/ BNG dated 19.8.2019). The parking yard and workshop will be removed in the year 2019-20 simultaneously as benches are progressing. Working in this part of the pit is already started; photographs of the same are attached as ANNEXURE-I for reference. This part of working is necessary to facilitate the backfilling areas in next plan period.



VEDANTA LIMITED

Sesa Goa Iron Ore, Kharakabali IS, ONG Chemicals, 1st Floor, Seelaj Road, Sakinaka, Bangalore - 560060 T: 08020512775 | www.sesagoanironore.com

Registered Office: Vedanta Limited, 1st Floor, 'C' wing, Unit 103, Chiranjeeva Avenue, Akshayapada, Chokkai, Andheri East, Mumbai - 400053, Maharashtra, India
CIN: L13200MH1999PLC291384

- iii) *Retaining wall was not constructed as per the approved document against the proposal of 409 mts.*

Submission:

With reference to approved mining plan the area identified for construction of retaining wall was 409 mts i.e. 168 mts in dump3 and remaining 241 mts was proposed in new office area. Out of this 168 mts is already constructed in dump 3 area and remaining construction is proposed in latest approved mining plan.

- Rule 26(2) *Yearly report on PMCP setting forth the extend of protective and rehabilitative work carried out as per the approved Progressive Mine Closure Plan has not been submitted till date.*

Submission:

Soft copy of yearly report of PMCP returns was submitted to your good office through email dated 29.06.2019 to rcmbng@rediffmail.com (Attached as ANNEXURE-2), hard copy of the PMCP returns is also sent to your good office on the same date. We are attaching here with copy of email (Attached as ANNEXURE-2) and copy of PMCP returns (Attached as ANNEXURE-3) for your ready reference.

- Rule 45(7) *Following deficiencies were observed in the annual Returns submitted;*

- i. *As per the approved document no area is considered as fully reclaimed and rehabilitated, whereas 23.24 ha is shown in annual returns. (refer part I of annual returns)*

Submission:

In annual return, part-I, sl.no 12(iii) the lease area utilization at the end of the year, it is shown under reclaimed-rehabilitated as 23.24 ha. Since plantation area is above the dump area so these areas can be considered in waste dump area only instead of reclaimed/rehabilitated area. In subsequent annual and other returns these will be corrected.

- ii. *Ex-mine price is given for ores even though there is no dispatch of lumps & fines. (ref Part IV of the Annual Returns)*

Submission:

Annual returns part IV, will be referred back and corrections in Ex-mine price for the non dispatched lumps and fines will be corrected accordingly.



VEDANTA LIMITED

Sesa Goa Iron Ore, Karmadola 15, S&S Chambers, 1st Floor, Bankoy Road, Erandiwane, Bangalore - 560093. T: 08022512733 / www.vedantagroup.com

Registered Office: Vedanta Limited, 1st Floor, 'C' wing, Unit 103, Corporate Avenue, Atrix Projects, Chiplin, Andheri (East), Mumbai 400093, Maharashtra, India
CIN: L11020MH1985PLC0201294



vedanta

transforming elements

sesa goa iron ore

- iii. *The Royalty, DMF & NMET may be given separately for calculating the cost of production. (ref part VII of the annual returns)*

Submission:

Royalty on dispatched material is paid by the buyer therefor it is not considered as part of our cost of production. There is no option to mention DMF and NMET separately in cost of production in online annual return form, therefor it is mentioned together into others section.

We hope that above mentioned reasons will suffice. We will produce further documents if required. In view of the compliance mentioned above we request you to please withdraw the said violation and oblige.

For **VEDANTA LIMITED**

7/9/19
Manager - Mining
Vijayanand Chakrasali
Mines Manager
From Vedanta Ltd

Copy for Information to:-

1. The controller of Mines (SZ), IBM, Bangalore
2. The Director, Department of Mines and Geology, Govt. of Karnataka, Kharija Bhavan, Race Course Road, Bangalore 560001. To,



VEDANTA LIMITED

Sesa Goa Iron Ore, Karnataka 15, 5th Floor, 1st Floor, Sakinaka Road, Sakinaka, Bangalore - 560080. T: 08023612703 | www.vedantalimited.com

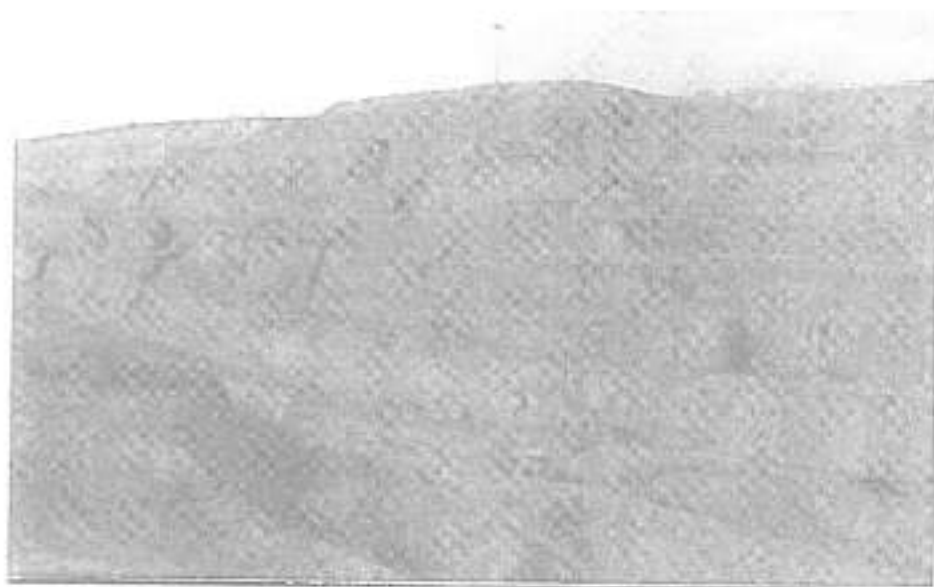
Registered Office: Vedanta Limited, 1st Floor, 10 wing, Unit 103, Corporate Avenue, And Promoters, Dattala, Andheri (East), Mumbai 400053, Maharashtra, India

CIN: 113305MH1005PLC293394

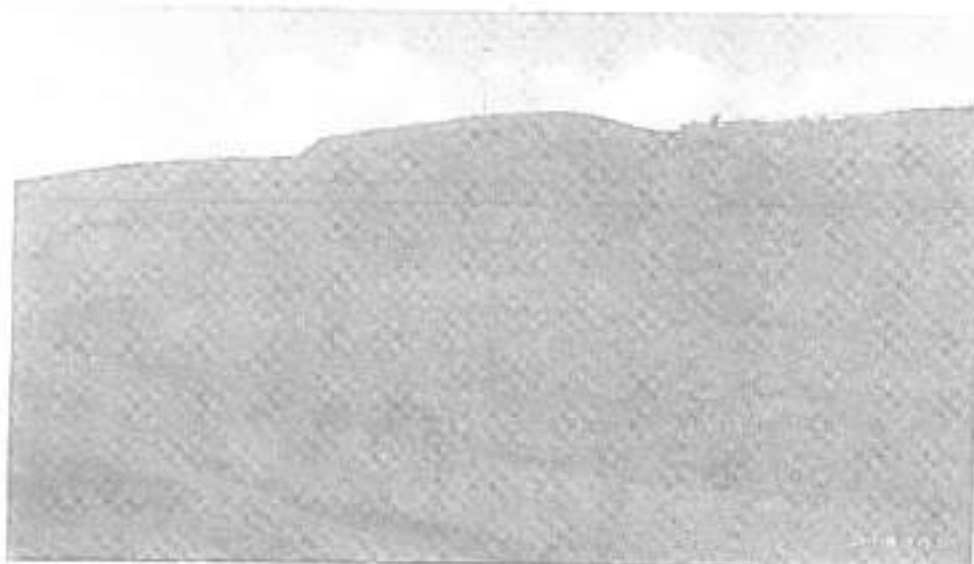
10

ANNEXURE-1

PIT photos of South Block, footwall side section 7A-7A' to 9A-9A'



Pit position during mine inspection on 05.07.2019



Pit position after starting of operations as on 19.08.2019



: EMAIL to rcmbmg@rediffmail.com IBM Bangalore office dated 29.06.2019

LONG-TERM EFFECTS

10

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Aditya K. Sengupta





sesa goa iron ore

29th June 2019

To,
The Regional Controller of Mines
Indian Bureau of Mines,
Industrial Estate, Goruguntapalya,
Yeshwantpura
Bangalore - 22

Subject: Report on Reclamation and Rehabilitation carried out in accordance with the proposals in approved PMCP and FMCP for the year 2018-19 for Vedanta Limited Iron Ore Mine of M/s Vedanta Limited (ML: 2677) situated in Chitradurga, Karnataka.

Respected Sir,

With reference to the above subject, we are herewith submitting the information on Reclamation and Rehabilitation carried out in accordance with the proposals in approved PMCP and FMCP for the year 2018-19 for Vedanta Limited Iron Ore Mine of M/s Vedanta Limited (ML: 2677) situated in Chitradurga, Karnataka.

Thanking You,
For Vedanta Limited

For VEDANTA LIMITED

29/6/19
Manager - Mining
Authorized Signatory

Enclosures:

1. Duly filled "Format- B".
2. Air Monitoring Results as Annexure I
3. Water Monitoring Results as Annexure II
4. Noise level Monitoring Results as Annexure III



VEDANTA LIMITED (formerly known as Iron Ore India Ltd.) Sesa Goa (Ld.)
Sesa Goa Iron Ore, Sesa Goa, 70 EDC Complex, Patta, Pargana, Goa - 401 002 India
T +91 0832 2440602 Website: www.sesagoa.com

Placed and signed: Vedanta Limited, 1st Floor, C- wing, 1st 103, Frontier Avenue, And Projects, Chhatrapati Sambhaji Maharaj Vastu Sangrahalaya, Mumbai - 400 007, Maharashtra, India.
13



Form: B
INFORMATION ON RECLAMATION & REHABILITATION CARRIED OUT IN ACCORDANCE WITH THE PROPOSALS IN APPROVED PMCP & FMCP FOR THE YEAR 2018-19 & CUMULATIVE FIGURES (Mins-wiss)
 Name of the Mine: A Majra Mine (Ms. 2677) of M/s Vedanta Limited
 District: Chhattisgarh

| Vedanta Limited Iron Ore Mines (ML NO. 2677) for the year 2018-2019 | | | | | | | |
|---|---|-----------|----------|------------|-------------|---------------------|---------------|
| FIGURES (Rupee-wise) | | | | | | | |
| | | Area (Ha) | | Quantities | | Expenditure (In Rs) | |
| | | Proposed | Achieved | Proposed | Achieved | Proposed | Achieved |
| A) Reclamation and Rehabilitation of mined out area | i) Rock filling | - | - | - | - | - | - |
| | ii) Afforestation on the backfilled area | - | - | - | - | - | - |
| | iii) Other vegetation (specify) i.e. afforestation on exhausted benches | - | - | - | - | - | - |
| | iv) Phoculture | - | - | - | - | - | - |
| | v) Contouring in water reservoir | - | - | - | - | - | - |
| | vi) Planting spot | - | - | - | - | - | - |
| | 7. Fencing | - | - | - | - | - | - |
| | 8) Picking (Sq.M) | - | - | - | - | - | - |
| | ii) Construction of parapet wall/reinforcing walls at the toe of the dump | NA | NA | NA | 863.57 Sq.M | - | 437,263.00 |
| | iii) Construction of check dams along slopes/valleys etc. (In Nos) | NA | NA | NA | 4,164.60 | - | 80,942,207.99 |
| B) Stabilisation & Rehabilitation of dump within lease | iv) Construction of gabion fences (In Meters) | - | - | - | 18.00 | - | 16,091,204.21 |
| | v) Details of settling ponds | - | - | - | 3,710.00 | - | 21,885,200.92 |
| | vi) Afforestation on dumps | NA | NA | NA | 2.00 | - | 12,579,692.87 |
| | vii) Others | Under ML | 4.17 | 400.00 | 22,830.00 | 9,174,161.80 | 21,390,510.00 |
| | Crusher ML | NA | 2.28 | - | 5,500.00 | - | - |
| | 8.11 Others | - | - | - | - | - | - |
| | 9.11 Others | - | - | - | - | - | - |
| | 10.11 Others | - | - | - | - | - | - |
| | 11.11 Others | - | - | - | - | - | - |
| | 12.11 Others | - | - | - | - | - | - |
| C) Rehabilitation of mining area within lease | 13.11 Others | NA | NA | NA | 540.00 | 479,564.00 | 950,004.00 |
| | 14.11 Others | - | - | - | 39.00 | 3,777,853.35 | 2,899,133.21 |
| | 15.11 Others | - | - | - | 953.42 | - | 5,240,238.22 |
| | 16.11 Others | - | - | - | 14.00 | - | 10,062,147.06 |
| | 17.11 Others | - | - | - | - | - | - |
| | 18.11 Others | - | - | - | - | - | - |
| | 19.11 Others | - | - | - | - | - | - |
| | 20.11 Others | - | - | - | - | - | - |
| | 21.11 Others | - | - | - | - | - | - |
| | 22.11 Others | - | - | - | - | - | - |
| D) Environmental Monitoring (Scan Zone & Buffer Zone) | 23.11 Others | - | - | - | - | - | - |
| | 24.11 Others | - | - | - | - | - | - |
| | 25.11 Others | - | - | - | - | - | - |
| Detail technical report has been attached herewith as Annexure-1 | | | | | | | |
| Detail technical report has been attached here with as Annexure-2 | | | | | | | |
| Detail technical report has been attached herewith as Annexure-3 | | | | | | | |
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Received on
13 Dec 2019

मंत्रालयित डाक द्वारा



भारत सरकार / GOVERNMENT OF INDIA
खान मंत्रालय / MINISTRY OF MINES
भारतीय खान ब्यूरो / INDIAN BUREAU OF MINES
क्षेत्रीय खान नियंत्रक कार्यालय / OFFICE OF THE REGIONAL
CONTROLLER OF MINES

फैक्स: 0800 23371027 / 23373287

दूरभाष: 080-23371027 - 23375366/07

Email ID: crs_bangalore@ibm.gov.in

29, इंडस्ट्रियल एरवे 11 स्ट्रीट, तुमकुर रोड,

सौरभटापाखा पैकवातपुर,

बैंगलूर - 560022

से Letter No. KNTCTHFs-4/BNG/CLAY/913

दिनांक: 10.12.2019

से उ में

Shri. Satvick Marimdar,

Nominated Owner,

Seet Oher 20th DC Complex,

Patta Pampore, Tumkur,

(Pin-560022)

विषय: Violation of provisions of Mineral Conservation and Development Rules, 2017 in respect of case of Vidhana Limited (ML-2677) over an area of 150.54 Ha located in Chitradurga district of Karnataka State.

महोदय Sir,

The following provisions of Mineral Conservation and Development Rules, 2017, were found violated in your above mine during the inspection on 05.7.2019 by Sri Arun Kumar, Deputy Controller of Mines and communicated to you vide this office registered letter of even number dated 30.07.2019 giving you a period of 45 (Forty-Five) days time for rectification of the same & subsequent inspection carried out by the undersigned dated 05.11.2019.

| Rule | Nature of violations observed |
|-------|---|
| 14(1) | <p>Modified RMP with PMCP was approved vide letter no.270/27201/ BNG/CLAY dated 25.03.2018 for a period of 2018-19 to 2021-2022. The deviation observed in mining operation vis-à-vis approved document are given below</p> <p>(i) It was observed that the production & development plan was deviated from the proposal towards Southern side in between Section Line AA-AA' to AA-AA'</p> <p>(ii) It was noticed that alluvium ore had not been worked up in between section line section AA-AA' to AA-AA' thus resulting in no generation of mineral reject and lowering of stripping ratio.</p> |

02. Till date you have not complied the pointed out violation and the reply received from you vide your letter dated 07.09.2019 has been examined and is not found satisfactory in respect of Rule 13(3).
03. It is again brought to your notice that these violations constitute an offence punishable under rule 62 of MCDR 2017. On non compliance of the above provisions of MCDR 2017, the mining operation can be suspended under the rule 11(2) of the above mentioned rules.
04. You are therefore, directed to **show cause** within a period of 30 (thirty) days from the date of issue of this letter as to why your mine should not be suspended for the above offence.
05. Please note that no further notice will be given to you in this regard.

आपकी सेवा में Yours faithfully,

(सो सी सीणा)
उत्तरीय खान नियंत्रक
भारतीय खान विभाग

प्रतिलिपि सूचना के लिए (Copy for kind information to)

1. The Controller of Mines (C/M) Indian Bureau of Mines, Bangalore.
2. The Director, Department of Mining & Geology, No.49, Khanpabbavai, R.C. Road, Bangalore-560 001

उत्तरीय खान नियंत्रक
भारतीय खान विभाग

Date: 03.01.2020

To
The Regional Controller of Mines
Indian Bureau of Mines
Southern Region
Bangalore-560022

Dear Sir

Subject: Violations on provisions of MCDR-2017 in respect of Vedanta Limited (M. L. No 2677) over an area of 160.59Ha in Chitradurga district, Karnataka State.

Ref: Your good office letter no KNT/CTD/FE-4/BNG/Vol-IV/917 Dt. 11th December 2019

Rule 11(1) *Modified RMP with PMCP was approved vide letter no.279/272/91/BMG/24 dated 23.03.2018 for a period of 2018-19 to 2021-22. The deviations observed in mining operations vis a vis approved document are given below:*

- (i) *It was observed that the production and development plan was deviated from the proposal towards southern side in between section line 3A-3A' to 5A-5A'.*

Submission:

Due to presence of Limonitic Ore Bench we faced huge quality issues. Due to quality issue we had slightly deviated from approved plan in the section 3A-3A' to 5A-5A'. However same has been submitted to your good office for modification. The modification in proposals of production & development work at sections 3A-3A' to 5A-5A' for the year 2019-20 were approved in latest modified approved mining plan (letter no.279/272/91/ BNG dated 19/8/2019). Currently working is done as per latest approved mining plan without any deviation.

- (ii) *It was noticed that siliceous ore had not been worked out in between section line section 7A-7A' to 9A-9A', thus resulting in no generation of mineral reject and lowering of stripping ratio.*

Submission:

The proposals of production & development work at sections 7A-7A' to 9A-9A' is made in latest modified approved mining plan (letter no.279/272/91/ BNG dated 19/8/2019). We have started working in this area as per the approved production and development plan for FY 2019-20. Till date 6010 tonnes of siliceous ore is produced from the above said sections. By end of FY 2019-20 proposed annual production quantity of siliceous ore will be produced.

9-1-20

VEDANTA LIMITED

Sesa Goa Iron Ore, Karnataka Region, 1046 Choudhary, 1st Floor, 2nd & 3rd, 4th Floor, Bangalore - 560022. Tel: 080-22201274. Fax: 080-22201275. Email: info@vedanta.com

Registered Office: Vedanta Limited, 11th Floor, 12, West, 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th, 15th, 16th, 17th, 18th, 19th, 20th, 21st, 22nd, 23rd, 24th, 25th, 26th, 27th, 28th, 29th, 30th, 31st, 32nd, 33rd, 34th, 35th, 36th, 37th, 38th, 39th, 40th, 41st, 42nd, 43rd, 44th, 45th, 46th, 47th, 48th, 49th, 50th, 51st, 52nd, 53rd, 54th, 55th, 56th, 57th, 58th, 59th, 60th, 61st, 62nd, 63rd, 64th, 65th, 66th, 67th, 68th, 69th, 70th, 71st, 72nd, 73rd, 74th, 75th, 76th, 77th, 78th, 79th, 80th, 81st, 82nd, 83rd, 84th, 85th, 86th, 87th, 88th, 89th, 90th, 91st, 92nd, 93rd, 94th, 95th, 96th, 97th, 98th, 99th, 100th, 101st, 102nd, 103rd, 104th, 105th, 106th, 107th, 108th, 109th, 110th, 111th, 112th, 113th, 114th, 115th, 116th, 117th, 118th, 119th, 120th, 121st, 122nd, 123rd, 124th, 125th, 126th, 127th, 128th, 129th, 130th, 131st, 132nd, 133rd, 134th, 135th, 136th, 137th, 138th, 139th, 140th, 141st, 142nd, 143rd, 144th, 145th, 146th, 147th, 148th, 149th, 150th, 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We hope that above mentioned reasons will suffice. We will produce further documents if required. In view of the compliance mentioned above we request you to kindly withdraw the said show cause and oblige.

Thanking you
For **VEDANTA LIMITED**


Manager - Mining
Vijayanand Chakrasali
Mines Manager
From Vedanta Ltd

Copy for Information to:-

1. The controller of Mines (S2), IBM, Bangalore
2. The Director, Department of Mines and Geology, Govt. of Karnataka, Kharja Bhavan, Race Course Road, Bangalore 560001 To,

Vedanta Ltd - Lithologs of Drilled BH during 2018-19

| HOLE_ID | FROM | TO | DEPTH | Fe% | Ore Type | HOLE_ID | FROM | TO | DEPTH | Fe% | Ore Type |
|---------|--------|--------|--------|-------|----------|---------|--------|--------|--------|-------|----------|
| ANDD331 | 0.00 | 122.50 | 122.50 | 13.19 | WASTE | ANDD339 | 0.00 | 152.00 | 152.00 | 16.65 | WASTE |
| ANDD331 | 122.50 | 223.70 | 101.20 | 31.73 | BHQ | ANDD339 | 152.00 | 162.00 | 10.00 | 19.82 | BHQ |
| ANDD332 | 0.00 | 107.80 | 107.80 | 14.68 | WASTE | ANDD339 | 162.00 | 276.50 | 114.50 | 35.08 | SO |
| ANDD332 | 107.80 | 215.00 | 107.20 | 41.51 | SO | ANDD339 | 276.50 | 300.00 | 23.50 | 11.08 | WASTE |
| ANDD332 | 215.00 | 227.00 | 12.00 | 16.55 | BHQ | ANDD340 | 0.00 | 44.15 | 44.15 | 51.60 | NO |
| ANDD333 | 0.00 | 33.00 | 33.00 | 51.72 | NO | ANDD340 | 44.15 | 132.00 | 87.85 | 20.32 | WASTE |
| ANDD333 | 33.00 | 65.00 | 32.00 | 22.77 | WASTE | ANDD340 | 132.00 | 197.00 | 65.00 | 53.34 | NO |
| ANDD333 | 65.00 | 176.00 | 111.00 | 38.03 | SO | ANDD340 | 197.00 | 216.00 | 19.00 | 38.82 | SO |
| ANDD333 | 176.00 | 188.00 | 12.00 | 16.81 | WASTE | ANDD340 | 216.00 | 221.20 | 5.20 | 25.43 | BHQ |
| ANDD334 | 0.00 | 147.00 | 147.00 | 14.38 | WASTE | ANDD340 | 221.20 | 245.00 | 23.80 | 15.50 | WASTE |
| ANDD334 | 147.00 | 180.00 | 33.00 | 37.30 | SO | ANDD341 | 0.00 | 55.60 | 55.60 | 8.20 | WASTE |
| ANDD334 | 180.00 | 215.00 | 35.00 | 16.83 | BHQ | ANDD341 | 55.60 | 118.00 | 62.40 | 20.12 | BHQ |
| ANDD335 | 0.00 | 48.00 | 48.00 | 28.87 | WASTE | ANDD342 | 0.00 | 98.00 | 98.00 | 18.58 | WASTE |
| ANDD335 | 48.00 | 89.50 | 41.50 | 51.61 | NO | ANDD342 | 98.00 | 135.00 | 37.00 | 20.98 | BHQ |
| ANDD335 | 89.50 | 119.00 | 29.50 | 37.00 | SO | ANDD342 | 135.00 | 155.00 | 20.00 | 26.90 | SO |
| ANDD335 | 119.00 | 132.00 | 13.00 | 28.50 | BHQ | ANDD342 | 155.00 | 173.00 | 18.00 | 28.73 | BHQ |
| ANDD335 | 132.00 | 147.00 | 15.00 | 7.58 | WASTE | ANDD342 | 173.00 | 186.00 | 13.00 | 34.10 | SO |
| ANDD336 | 0.00 | 60.00 | 60.00 | 50.50 | NO | ANDD342 | 186.00 | 224.00 | 38.00 | 25.80 | BHQ |
| ANDD336 | 60.00 | 157.00 | 97.00 | 14.64 | WASTE | ANDD342 | 224.00 | 233.00 | 9.00 | 7.68 | WASTE |
| ANDD336 | 157.00 | 196.00 | 39.00 | 28.76 | SO | ANDD343 | 0.00 | 178.00 | 178.00 | 15.95 | WASTE |
| ANDD336 | 196.00 | 239.00 | 43.00 | 51.81 | NO | ANDD343 | 178.00 | 203.00 | 25.00 | 37.02 | SO |
| ANDD336 | 239.00 | 281.00 | 41.10 | 42.97 | SO | ANDD343 | 203.00 | 227.00 | 24.00 | 28.86 | BHQ |
| ANDD336 | 281.00 | 290.00 | 9.00 | 17.77 | BHQ | ANDD343 | 227.00 | 282.00 | 55.00 | 35.97 | NO |
| ANDD336 | 290.00 | 310.00 | 20.00 | 19.67 | WASTE | ANDD343 | 282.00 | 300.50 | 18.50 | 6.38 | WASTE |
| ANDD337 | 0.00 | 234.00 | 234.00 | 14.00 | WASTE | ANDD346 | 155.10 | 233.00 | 77.90 | 39.84 | SO |
| ANDD337 | 234.00 | 273.50 | 39.50 | 24.59 | BHQ | ANDD346 | 233.00 | 255.00 | 22.00 | 23.16 | BHQ |
| ANDD337 | 273.50 | 290.00 | 16.50 | 17.27 | WASTE | ANDD346 | 255.00 | 270.00 | 15.00 | 35.16 | SO |
| ANDD337 | 290.00 | 325.00 | 35.00 | 36.05 | BHQ | ANDD346 | 270.00 | 289.00 | 19.00 | 5.50 | BHQ |
| ANDD338 | 0.00 | 73.50 | 73.50 | 53.31 | NO | ANDD347 | 0.00 | 89.00 | 89.00 | 9.99 | WASTE |
| ANDD338 | 73.50 | 135.50 | 62.00 | 20.78 | WASTE | ANDD338 | 284.00 | 290.00 | 6.00 | 18.71 | BHQ |
| ANDD338 | 135.50 | 260.00 | 124.50 | 52.66 | NO | | | | | | |
| ANDD338 | 260.00 | 284.00 | 24.00 | 10.07 | SO | | | | | | |
| ANDD338 | 284.00 | 290.00 | 6.00 | 18.71 | BHQ | | | | | | |


SRIPAD PUJAR
QUALIFIED PERSON


B.V.R. ACHAR
QUALIFIED PERSON

SGS

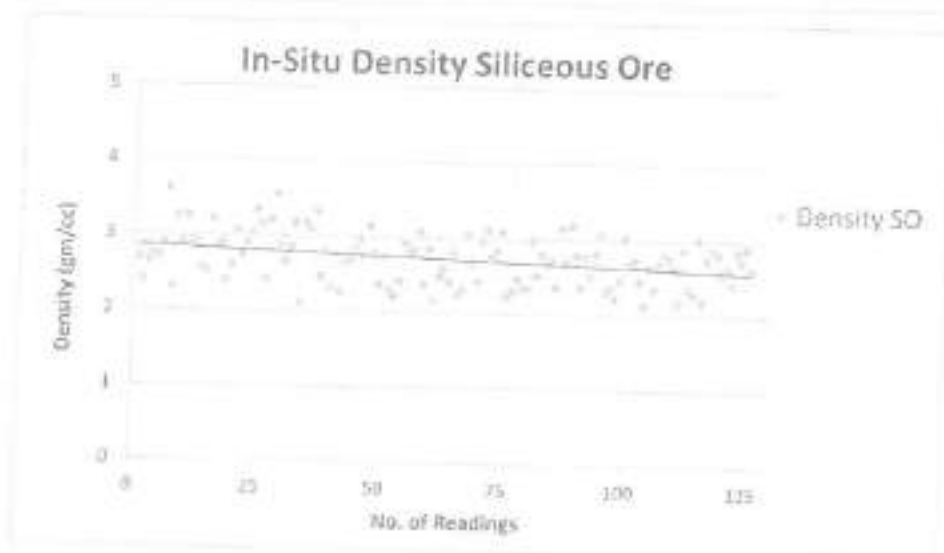
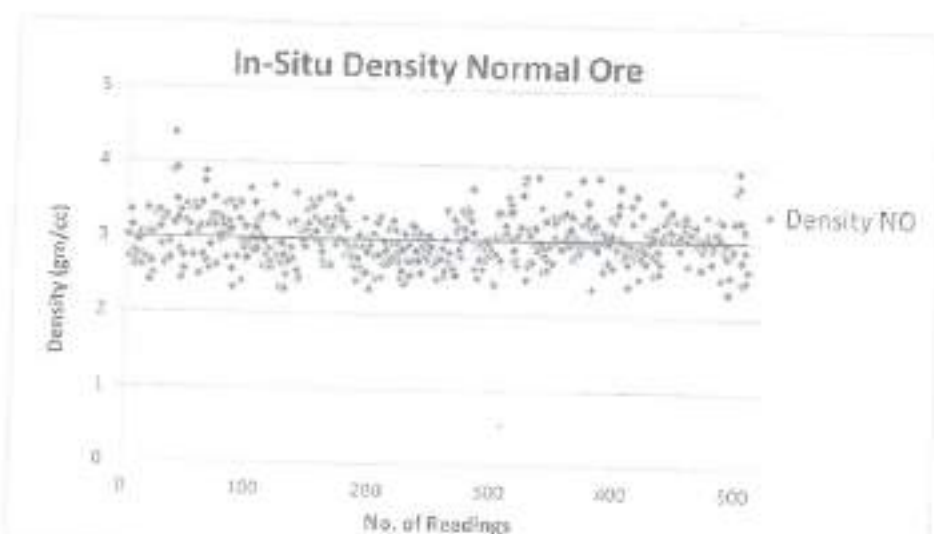
REPORT NO. : 16011801A3

Date: 17/03/2015

PO No. : 4800011560 dated 11.12.2015

Insitu Bulk density test and chemical analysis report at ANM Mines

| Ore Type | Density (gm/cc) | No. of Readings |
|---------------|-----------------|-----------------|
| Normal Ore | 3.00 | 508 |
| Siliceous Ore | 2.70 | 126 |



[Signature]
SRIPAD PUJAR
QUALIFIED PERSON

[Signature]
B.V.R. ACHAR
QUALIFIED PERSON

SGS

Report N°: 16042003D6

Page N°: 1/1

INSPECTION REPORT

REF: IN/HOS/MIN/201500040/1

DATE: 02.03.2016

CARGO DESCRIBED AS :

Iron ore (ROM)

SELLER :

M/s. Vedanta Ltd.

PLACE & DATE OF

At A. Narain Iron ore Mines ML No 2677 (As informed by Vedanta)

ATTENDANCE

on 23rd February 2016

In accordance with the instructions received from our principal, **M/s. Vedanta Ltd.**, we have attended the recovery test and chemical analysis for iron ore float material and the details are as under:

SAMPLING / SAMPLE PREPARATION:

Manual sampling was carried out as per mutual agreed SOP during the course of opening of pits and requisite number of increments was collected for recovery test and chemical analysis. Sample processed further to obtain representative composite sample. Total two sample packets were prepared and sealed our monogram SGS-05. One sealed sample packet was submitted to our laboratory and remaining one sample is retained by us for record. The recorded sample will be retained by us for a period of two months until and unless definite instructions to the contrary are received in the mean time.

ANALYSIS:

One composite sample analysed our in-house laboratory. For each pit the results obtained are as under:-

Fe, SiO₂, Al₂O₃, P, Mn as per ISM 01 and S as per IS 1493 (Part-1) and size test conducted as per IS 1607-2013.

Chemical Composition (on dried basis) RESULTS

| Recovery Test of Iron ore | | | | | | | |
|---------------------------|-------|-------|------|--------------------|----------------------------------|-------|-------|
| Wt % | SIZE | Fe% | Mn% | SiO ₂ % | Al ₂ O ₃ % | P% | S% |
| 1.78 | +40mm | 61.49 | 2.82 | 2.91 | 4.11 | 0.236 | 0.011 |
| 11.11 | +20mm | 57.85 | 0.39 | 1.75 | 3.77 | 0.426 | 0.011 |
| 20.89 | +10mm | 55.85 | 1.18 | 3.06 | 6.32 | 0.204 | 0.013 |
| 13.78 | +6mm | 55.91 | 1.58 | 5.25 | 2.8 | 0.105 | 0.009 |
| 52.44 | -6mm | 53.83 | 1.07 | 1.76 | 3.0 | 0.136 | 0.012 |

The above reflects our findings at time and place of inspection. This certificate does not relieve Sellers/Suppliers from their contractual responsibilities nor does prejudice buyer's right of claim towards Seller/Supplier for compensation for any apparent and/or hidden defects not detected during our random inspection at occurring thereafter.

The manual sampling method was agreed with the SGS Principal, as sampling by more reliable methods that provide probability samples was not possible. The Holder of this document is cautioned that collected MANUAL samples of this type do not satisfy the minimum requirements for probability sampling, and as such cannot be used to draw statistical inferences such as precision, standard error or bias.

Recovery sampling is the least preferred of sampling for obtaining a truly representative sample. Due to the limitations of the sampling method and limited access to the entire volume of the cargo, the samples collected will not be representative of the entire cargo but only that part accessible and sampled. SGS accepts no liability for the consequences of any action taken or not taken on the basis of this report.

For SGS INDIA PVT. LTD.,

SGS India Private Limited

SGS House

48 Adi Shankaracharya Marg

Vikhroli (W), Mumbai-400 083

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SRIPAD PUNJIA
QUALIFIED PERSON

MR. ACHAR
QUALIFIED PERSON

INSPECTION REPORT

REF: IN/HOS/MIN/201500040/1

DATE: 02.03.2016

CARGO DESCRIBED AS :

Iron ore (ROM)

SELLER :

M/s. Vedanta Ltd.

PLACE & DATE OF

At A. Narrain Iron ore Mines ML No 2677 (As informed by Vedanta)

ATTENDANCE

on 23rd February 2016

In accordance with the instructions received from our principal **M/s. Vedanta Ltd.**, we have attended the recovery test and chemical analysis for iron ore float material and the details are as under:

SAMPLING / SAMPLE PREPARATION:

Manual sampling was carried out as per mutual agreed SOP during the course of opening of pits and requisite number of increments was collected for recovery test and chemical analysis. Sample processed further to obtain representative composite sample. Total two sample packets were prepared and sealed our monogram SGS-05. One sealed sample packet was submitted to our laboratory and remaining one sample is retained by us for record. The recorded sample will be retained by us for a period of two months until and unless definite instructions to the contrary are received in the mean time.

ANALYSIS:

One composite sample analysed our In-house laboratory. For each pit the results obtained are as under:-

Fe, SiO₂, Al₂O₃, P, Mn as per IS 1493 (Part-1) and S as per IS 1493 (Part-1) and size test conducted as per IS 1607-2013

Chemical Composition (on dried basis) RESULTS

| Recovery Test of Iron ore | | | | | | | |
|---------------------------|-------|-------|------|--------------------|----------------------------------|-------|-------|
| Wt % | SIZE | Fe% | Mn% | SiO ₂ % | Al ₂ O ₃ % | P% | S% |
| 5.45 | +40mm | 58.42 | 0.68 | 5.86 | 3.89 | 0.3 | 0.014 |
| 15.45 | +20mm | 55.75 | 5.2 | 2.42 | 2.32 | 0.104 | 0.013 |
| 23.21 | +10mm | 59.96 | 1.11 | 3.84 | 3.13 | 0.326 | 0.013 |
| 17.57 | +6mm | 56.87 | 2.81 | 5.48 | 2.6 | 0.086 | 0.014 |
| 38.02 | -6mm | 57.86 | 2.47 | 2.22 | 3.02 | 0.179 | 0.012 |

The above reflects our findings at time and place of inspection. This certificate does not relieve Seller/Supplier from their contractual responsibilities nor does prejudice buyer's right of claim towards Seller/Supplier for compensation for any apparent and/or hidden defects not detected during our random inspection or occurring thereafter.

The manual sampling method was agreed with the SGS Principal, as sampling by more reliable methods that provide probability samples was not possible. The holder of this document is cautioned that collected MANUAL samples of this type do not satisfy the minimum requirements for probability sampling, and as such cannot be used to draw statistical inferences such as precision, standard error or bias.

Stockpile sampling is the least preferred of sampling for obtaining a truly representative sample. Due to the limitations of the sampling method and limited access to the entire volume of the cargo, the samples collected will not be representative of the entire cargo but only that part accessible and sampled. SGS accepts no liability for the consequences of any action taken or not taken on the basis of this report.

For SGS INDIA PVT. LTD.,

SGS India Private Limited

SGS House

4B Adi Shankaracharya Marg

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INSPECTION REPORT

REF: IN/HOS/MIN/201500040/1

DATE: 02.03.2016

CARGO DESCRIBED AS :

Iron ore (ROM)

SELLER :

M/s. Vedanta Ltd.

PLACE & DATE OF

At A. Narrain Iron ore Mines ML No 2577 (As informed by Vedanta)

ATTENDANCE

on 23rd February 2016

In accordance with the instructions received from our principal, **M/s. Vedanta Ltd.**, we have attended the recovery test and chemical analysis for iron ore float material and the details are as under:

SAMPLING / SAMPLE PREPARATION:

Manual sampling was carried out as per mutual agreed SOP during the course of opening of pits and requisite number of increments was collected for recovery test and chemical analysis. Sample processed further to obtain representative composite sample. Total two sample packets were prepared and sealed our monogram SGS-05. One sealed sample packet was submitted to our laboratory and remaining one sample is retained by us for record. The recorded sample will be retained by us for a period of two months until and unless definite instructions to the contrary are received in the mean time.

ANALYSIS:

One composite sample analysed our In-house laboratory. For each pit the results obtained are as under:-

Fe, SiO₂, Al₂O₃, P, Mn as per IIM 01 and S as per IS 1493 (Part-1) and size test conducted as per IS 1607-2013

Chemical Composition (on dried basis) RESULTS

| Recovery Test of Iron ore | | | | | | | |
|---------------------------|-------|-------|------|--------------------|----------------------------------|-------|-------|
| Wt % | SIZE | Fe% | Mn% | SiO ₂ % | Al ₂ O ₃ % | P% | S% |
| 25.22 | +40mm | 60.43 | 0.33 | 1.31 | 5.15 | 0.117 | 0.013 |
| 18.92 | +20mm | 57.38 | 1.07 | 0.75 | 3.36 | 0.124 | 0.015 |
| 17.12 | +10mm | 58.21 | 0.82 | 0.5 | 4.28 | 0.161 | 0.012 |
| 8.00 | +6mm | 56.41 | 1.07 | 0.87 | 5.25 | 0.144 | 0.014 |
| 29.74 | -6mm | 55.37 | 1.07 | 0.95 | 4.28 | 0.174 | 0.013 |

The above reflects our findings at time and place of inspection. This certificate does not relieve Seller/Supplier from their contractual responsibilities nor does prejudice buyer's right of claim towards Seller/Supplier for compensation for any apparent and/or hidden defects not detected during our random inspection or occurring thereafter.

The manual sampling method was agreed with the SGS Principal, as sampling by more reliable methods that provide probability samples was not possible. The Holder of this document is cautioned that collected MANUAL samples of this type do not satisfy the minimum requirements for probability sampling, and as such cannot be used to draw statistical inferences such as precision, standard error or bias.

Stockpile sampling is the least preferred of sampling for obtaining a truly representative sample. Due to the limitations of the sampling method and limited access to the entire volume of the cargo, the samples collected will not be representative of the entire cargo but only that part accessible and sampled. SGS accepts no liability for the consequences of any action taken or not taken on the basis of this report.

For SGS INDIA PVT. LTD.,

SGS India Private Limited

SGS House

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REPORT OF INVESTIGATION
IBM/BNG/R.I.No. 765

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GOVERNMENT OF INDIA

खान मंत्रालय
MINISTRY OF MINES

भारतीय खान ब्यूरो
INDIAN BUREAU OF MINES



BENEFICIATION STUDIES ON A SILICEOUS IRON ORE SAMPLE (SO - 1) FROM
A.NARRAIN MINES, CHITRADURGA, KARNATAKA

FOR
M/s VEDANTA LIMITED, CHITRADURGA, KARNATAKA

क्षेत्रीय अयस्क प्रसाधन प्रयोगशाला
REGIONAL ORE DRESSING LABORATORY

बैंगलूरु
BENGALURU


SRIPATH PUJAR
QUALIFIED PERSON


B.V.R. ACHAR
QUALIFIED PERSON

INVESTIGATION TEAM

| | |
|---|---|
| GENERAL SUPERVISION &
PRINCIPAL INVESTIGATOR | : Smt. Indira Ravindran
Director (OD) |
| CO-INVESTIGATORS | : Dr. B. Devaprasad Ananth
Asstt. Research Officer |
| | Md. Asdulla
Sr. Technical Assistant |
| | Purna Chandra Rao, Tulluri
Jr. Technical Assistant |
| | V bhadra Rao Koruprolu
Jr. Technical Assistant |
| MINERALOGY | : Prakash Inkane
Sr. Technical Assistant |
| | Purna Chandra Rao, Mendu
Jr. Technical Assistant |
| CHEMICAL ANALYSIS | : D.V Moon
Sr. Chemist |
| | P. Hari Rama Krishna
Sr. Technical Assistant |

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| 3 | CHARACTERISTICS OF THE SAMPLE | 2 |
| 4 | EXPERIMENTAL WORK | 3 |
| 5 | SUMMARY AND CONCLUSIONS | 7 |
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REPORT OF INVESTIGATION
IBM/BNG/R.I.No.....765

BENEFICIATION STUDIES ON A SILICEOUS IRON ORE SAMPLE (SO - 1) FROM
A.NARRAIN MINES, CHITRADURGA, KARNATAKA

FOR
M/s VEDANTA LIMITED, CHITRADURGA, KARNATAKA

1. ABSTRACT

- 1.1 A siliceous iron ore sample (SO-1) from A.Narrain Mine, Chitradurga, Karnataka was received from M/s Vedanta Limited, Karnataka for beneficiation studies at the Regional Ore Dressing Laboratory, Indian Bureau of Mines, Bangalore.
- 1.2 The as received sample assayed 44.92% Fe(T), 64.24% Fe_2O_3 , 31.28% SiO_2 , 1.32% Al_2O_3 , 1.38% Mn, 0.24% CaO, 0.14% MgO, 0.09% P, 0.31% LOI and traces K_2O , Na_2O and S.
- 1.3 Hematite and quartz / feldspar are the major minerals present in the sample. Goethite / limonite, ferruginous clay, psilomelane / pyrolusite, pyrite are observed in minor to trace amounts.
- 1.4 The objectives of the investigation were to :
 - i) Carry out chemical analysis and mineralogical studies on the as received sample.
 - ii) Up grade the ore to >55% Fe(T) by dry methods
- 1.5 The as received sample was subjected to dry screening, the minus 50+0.425 mm fraction assayed 56.08% Fe (T) with 74.2% Fe(T) recovery (Wt.% yield 60.1) by simple screening the iron values improved from 45.42 to 56.08% Fe (T) .
- 1.6 This can be blended with the normal ore. The ratio of blending is 20:80 i.e. Normal: SO-1 ore analyses 55.40% Fe(T), 13.73% SiO_2 , 2.01% Mn.
- 1.7 The wet processing of minus 0.425 mm size, subjected to gravity separation, yielding a concentrate assaying 57.43% Fe (T) with 49.5% Fe (T) recovery (wt% yield 10.2).
- 1.8 The schematic flow sheet for Siliceous Iron Ore Sample (SO-1) is given in Fig No.1.

2. INTRODUCTION

- 2.1. About 200 kgs of siliceous iron ore sample- 1 was received from M/s Vedanta Limited, Chitradurga for dry beneficiation studies.
- 2.2. The beneficiation studies were carried out at the Regional Ore Dressing Laboratory, Indian Bureau of Mines, Bangalore.
- 2.3. The objectives of the investigation were to:
 - i) Carry out chemical analysis and mineralogical studies on the as received sample
 - ii) To upgrade the ore to > 55% Fe(T) by dry methods

3. CHARACTERISTICS OF THE SAMPLE

- 3.1. Physical
 - 3.1.1 The as received sample contained lumps of 50 mm size with fines. The lumps were hard and compact.
- 3.2. Chemical
 - 3.2.1 A representative portion of the as received sample was ground to requisite size and subjected to complete chemical analysis. The results of chemical analysis of the as received sample are given in Table No.1

Table No. 1: Chemical analysis of the as received sample

| Radicals | Percentage |
|--------------------------------|------------|
| Fe(T) | 44.92 |
| Fe ₂ O ₃ | 64.24 |
| SiO ₂ | 31.28 |
| Al ₂ O ₃ | 1.32 |
| Mn | 1.38 |
| CaO | 0.24 |
| MgO | 0.14 |
| K ₂ O | Traces |
| Na ₂ O | Traces |
| P | 0.09 |
| S | 0.05 |
| LOI | Traces |

3.3. Mineralogy

Hematite and quartz / feldspar are the major minerals present in the sample. Goethite / limonite, ferruginous clay, psilomelane / pyrolusite and pyrite are observed in minor to trace amounts.

Hematite is medium to coarse grained (100 to 900 microns) normally present as granular aggregates as pockets.

Quartz / feldspar are fine to medium grained (20 to 150 microns) present as discrete grains within the inter-granular spaces hematite

Goethite / limonite are fine to medium grained present as patches within the inter-granular spaces of hematite. The approximate percentage of different mineral constituents is given in Table No.2.

Table No. 2: Mineralogical constituents of the original sample

| Mineral | Percentage |
|--------------------------|------------|
| Hematite | 40- 45 |
| Quartz | 30 - 35 |
| Goethite / limonite | 7 - 10 |
| Ferruginous clay | 7 - 10 |
| Psilomelane / pyrolusite | 3 - 5 |
| Pyrite | Traces |
| Talc | Traces |

4. EXPERIMENTAL WORK

4.1. Dry size analysis of the as received sample

- 4.1.1 The as received sample was subjected to dry size analysis to check if iron values were segregating in any particular fractions and each fraction was subjected to chemical analysis. The results are given in Table No 3.

Table No. 3: Dry Sieve Analysis of As Received Sample

| Size
mm | Wt% | Assay% | | | Dist. | | |
|--------------|------|--------|------------------|------|-------|------------------|------|
| | | Fe(T) | SiO ₂ | Mn | Fe(T) | SiO ₂ | Mn |
| -50+25 | 6.6 | 56.03 | 16.31 | 1.75 | 8.1 | 3.3 | 9.8 |
| -25+19 | 5.6 | 53.23 | 23.16 | 1.04 | 6.6 | 4.1 | 4.9 |
| -19+12.5 | 7.3 | 55.58 | 19.51 | 1.05 | 8.9 | 4.4 | 6.5 |
| -12.5+6.3 | 15.2 | 57.82 | 14.43 | 1.35 | 19.4 | 6.8 | 17.4 |
| -6.3+3 | 9.9 | 56.64 | 14.61 | 1.22 | 12.3 | 4.5 | 10.2 |
| -3+1.7 | 3.7 | 56.69 | 14.53 | 1.38 | 4.7 | 1.7 | 4.4 |
| -1.7+1.2 | 3.7 | 54.8 | 16.51 | 1.55 | 4.4 | 1.9 | 4.8 |
| -1.2+0.85 | 3.1 | 55.93 | 15.51 | 1.74 | 3.8 | 1.5 | 4.5 |
| -0.85+0.6 | 2.7 | 54.25 | 16.55 | 1.74 | 3.3 | 1.4 | 4.0 |
| -0.6+0.425 | 2.3 | 54.18 | 18.12 | 1.38 | 2.7 | 1.3 | 2.7 |
| -0.425+0.3 | 2.5 | 51.84 | 22.12 | 1.73 | 2.8 | 1.7 | 3.6 |
| -0.3+0.212 | 2.4 | 47.72 | 28.67 | 2.09 | 2.6 | 2.2 | 4.3 |
| 0.212+0.150 | 3.1 | 39.92 | 39.74 | 1.38 | 2.8 | 3.9 | 3.7 |
| -0.150+0.106 | 4.6 | 27.76 | 58.2 | 0.86 | 2.8 | 8.3 | 3.3 |
| -0.106 | 27.3 | 24.73 | 62.44 | 0.69 | 14.8 | 53.0 | 15.9 |
| Head(Calc.) | 100 | 45.42 | 32.12 | 1.18 | 100 | 100 | 100 |
| -50 + 0.425 | 60.1 | 56.08 | 16.52 | 1.36 | 74.2 | 30.9 | 69.2 |
| -50 + 1.20 | 52.0 | 56.26 | 16.51 | 1.32 | 64.5 | 26.8 | 58.0 |
| Minus 0.425 | 39.9 | 29.35 | 55.62 | 0.95 | 25.8 | 69.1 | 30.8 |

- 4.1.2 As can be seen from the above table 3, the -50+0.425 mm fraction assayed 56.08% Fe (T) with 74.2% Fe(T) recovery (Wt.% yield 60.1) by simple screening the iron values improved from 45.42 to 56.08% Fe (T) with 1.36% Mn. This can be blended with the normal ore.

4.2. Blending Ratio

4.2.1 The blending ratio of normal ore with siliceous ore after screening i.e. minus 50+0.425 mm fraction is given below in Table No. 4.

4.2.2 The analysis of as received normal ore 52.71% Fe (T), 2.57% SiO₂, 5.04% Mn.

Table No. 4: Blending Ratio

| Normal
(By wt.) | Siliceous ore 1
(by wt. after
dry screening
at +0.425mm) | Assay% | Constituent |
|--------------------|---|--------|------------------|
| 50 | 50 | 54.39 | Fe |
| | | 9.55 | SiO ₂ |
| | | 3.2 | Mn |
| 40 | 60 | 54.73 | Fe |
| | | 10.94 | SiO ₂ |
| | | 2.83 | Mn |
| 30 | 70 | 55.06 | Fe |
| | | 12.33 | SiO ₂ |
| | | 2.46 | Mn |
| 20 | 80 | 55.40 | Fe |
| | | 13.73 | SiO ₂ |
| | | 2.1 | Mn |

The blending of 20:80 (Normal: SO-1) ore analysed 55.40% Fe(T), 13.73% SiO₂, 2.1% Mn.

4.2.3 The reject minus 0.425 mm after dry sizing of the as received sample was subjected to dry and wet processing.

4.3. Dry and Wet processing of minus 0.425 mm size

4.3.1 Dry magnetic Separation

The minus 0.425 mm fraction after dry screening of as received sample was subjected to dry magnetic separation on Box Magnetic Rapid separator at 15000 gauss. The results are given in Table No. 5.

Table No. 5: Dry Magnetic separation on minus 0.425 mm

| Product | Wt% | Fe(T) | SiO ₂ | Al ₂ O ₃ |
|---------|------|-------|------------------|--------------------------------|
| Mag | 3.0 | 48.05 | 27.53 | 1.3 |
| Non Mag | 36.9 | 28.33 | 56.30 | 1.1 |
| Head | 39.9 | 29.84 | 54.14 | 1.21 |

From the above Table No. 5, by dry magnetic separation, the minus 0.425 mm fraction could not be upgraded to desired level.

4.3.2 Wet Processing

The minus 0.425 mm was subjected to gravity separation on a Quarter deck Deister table with controlled feed and 7lpm wash water, to get concentrate, tail and slimes. The results are depicted in Table No. 6.

Table No. 6: Tabling of the sample ground to 0.425 mm

| S.No | Product | Wt% | Assay% | | | Dist | | |
|------|-------------|------|--------|------------------|------|-------|------------------|-------|
| | | | Fe(T) | SiO ₂ | Mn | Fe(T) | SiO ₂ | Mn |
| 1 | Conc. I | 4.0 | 64.19 | 7.37 | 0.61 | 21.7 | 1.3 | 9.6 |
| 2 | Conc.II | 6.2 | 53.07 | 20.99 | 0.74 | 27.8 | 5.9 | 18.0 |
| 3 | Tails | 9.4 | 13.52 | 79.41 | 0.55 | 10.7 | 33.9 | 20.3 |
| 4 | T. Slimes | 20.3 | 23.12 | 63.39 | 0.65 | 39.8 | 58.8 | 52.1 |
| 5 | Head | 39.9 | 29.61 | 54.98 | 0.64 | 100.0 | 100.0 | 100.0 |
| 6 | Conc.I + II | 10.2 | 57.43 | 15.65 | 0.69 | 49.5 | 7.3 | 27.6 |

As seen from the table 6, that by gravity separation the minus 0.425 mm fraction was upgraded from 29.61% to 57.43% Fe(T) with 49.5 % Fe(T) recovery (Wt.% yield 10.18).

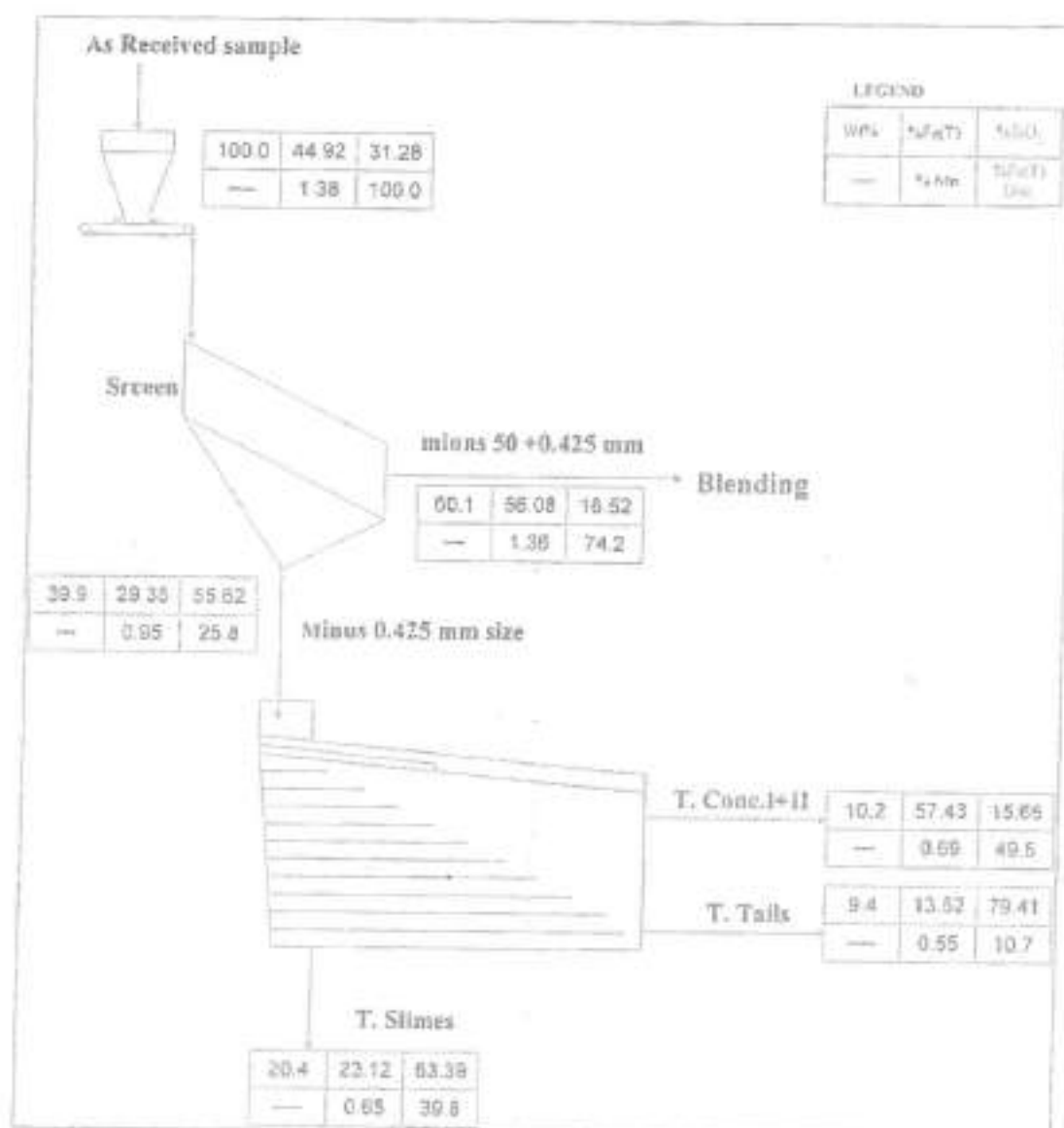
5. SUMMARY AND CONCLUSION

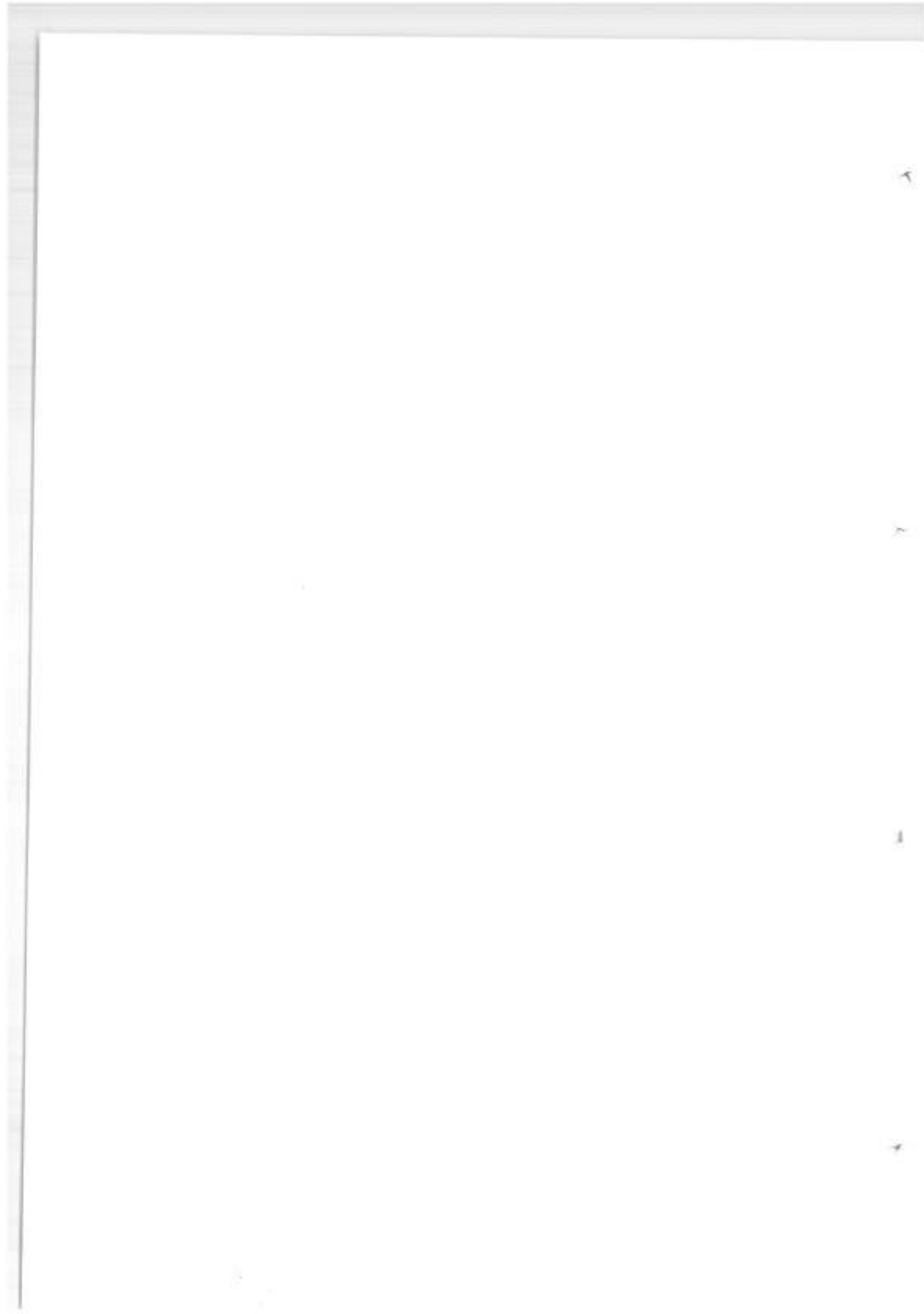
- 5.1 A siliceous iron ore sample (SO-1) from A.Narain Mine, Chitradurga, Karnataka was received from M/s Vedanta Limited, Karnataka for beneficiation studies at the Regional Ore Dressing Laboratory, Indian Bureau of Mines, Bangalore.
- 5.2 The as received sample assayed 44.92% Fe(T), 64.24% Fe_2O_3 , 31.28% SiO_2 , 1.32% Al_2O_3 , 1.38% Mn, 0.24% CaO, 0.14% MgO, 0.09% P, 0.31% LOI and traces K_2O , Na_2O and S.
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 - iii) Carry out chemical analysis and mineralogical studies on the as received sample.
 - iv) Up grade the ore to >55% Fe(T) by dry methods
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- 5.7 The wet processing of minus 0.425 mm size, subjecting to gravity separation, yielding a concentrate assaying 57.43% Fe (T) with 49.5% Fe (T) recovery (wt% yield 10.2)
- 5.8 The schematic flow sheet for Siliceous Iron Ore Sample (SO-1) is given in Fig No.1.

6. ACKNOWLEDGEMENT

The authors express their sincere thanks Shri R. K. Sinha, Controller General, Indian Bureau of Mines, Nagpur for his keen interest and also for his guidance in this investigation

Fig No.1: schematic flow sheet for Siliceous Iron Ore Sample (SO-1)







भारत सरकार/ Govt. of India
 श्रम एवं रोजगार मंत्रालय/ Ministry of Labour & Employment
 खान सुरक्षा महानिदेशालय/ Directorate General of Mines Safety
 बंगलुरु, क्षेत्र, द.अ. / Bengaluru Region, SZ.



ANNEXURE 21

E-Mail : dir.bgr@dgm.gov.in

No 5, 17th Main, 100 ft Road, 4th Block
 Koramangala, Bangalore- 560034 (Karnataka)
 Tel. : 080-25535971-74 FAX: 080-25535972

R/SZ/BGR/111(3)/P-40/2015-16/

बंगलुरु, दिनांक.

2015.

From/सेवा:

Director of Mines Safety/खान सुरक्षा निदेशक
 Bengaluru Region, Southern Zone/बंगलुरु क्षेत्र, द.अ.

To सेवा में

Shri R.Praveen Chandra,
 Owner: John Mine,
 No. 59, 12th Main, B-S X 1st Stage,
 1st Block, Srinagar,
 BANGALORE - 560 050

Shri D.D.Jalan,
 Nominated Owner: A Narrain Iron Ore Mine
 M/s Sesa Sterilite Limited
 (M/s Vedanta Limited), Sesa ghor, IOEDC Complex,
 Patta, Panaji, Goa-403001

Subject/विषय : Permission under Regulation 111(3) of the Metalliferous Mines Regulations, 1961 to work within 7.5m and up to the common mine boundary between A Narrain Iron ore mine (ML No.2677) of M/s Sesa Sterilite Limited (Re-named as M/s Vedanta Limited) and John Mines (M.L No.2294) of Sri R.Praveen Chandra- Modification thereof.

- Ref: 1. Your application No. Nil dated 25.05.2015
 2. Permission letter No.CR/Iron ore/Perm/2009/4090 dated 07.12.2009

Sir/श्रीमान:

Please refer to your application No. Nil dated 25.05.2015 on the above subject enclosing therewith Surface Plan No. Nil dated 27.03.2015

It has been stated in your joint application that the modification in the Mine boundary has been done as per the directives of Central Empowered Committee appointed by Hon'ble Supreme court.

The said modification of mine boundaries at your mines has been noted at this Directorate.

However, you are hereby requested to comply with the conditions of the permission under Regulation 111(3) of the Metalliferous Mines Regulations, 1961 granted vide this Directorate's letter No.CR/Iron ore/Perm/2009/4090 dated 07.12.2009 to work within 7.5m of the modified mine boundary as shown on Surface Plan No. Nil dated 27.03.2015.

Further, you are also requested to submit an updated Surface Plan of each of your mine separately showing modified mine boundary to this Directorate at the earliest.

Yours faithfully/आपका विश्वसनीय,

Sd/-
 (S.K Das)

Director of Mines Safety/खान सुरक्षा निदेशक
 Bengaluru Region, Southern Zone/बंगलुरु क्षेत्र, द.अ.

SRIPAD PUJAR
 QUALIFIED PERSON

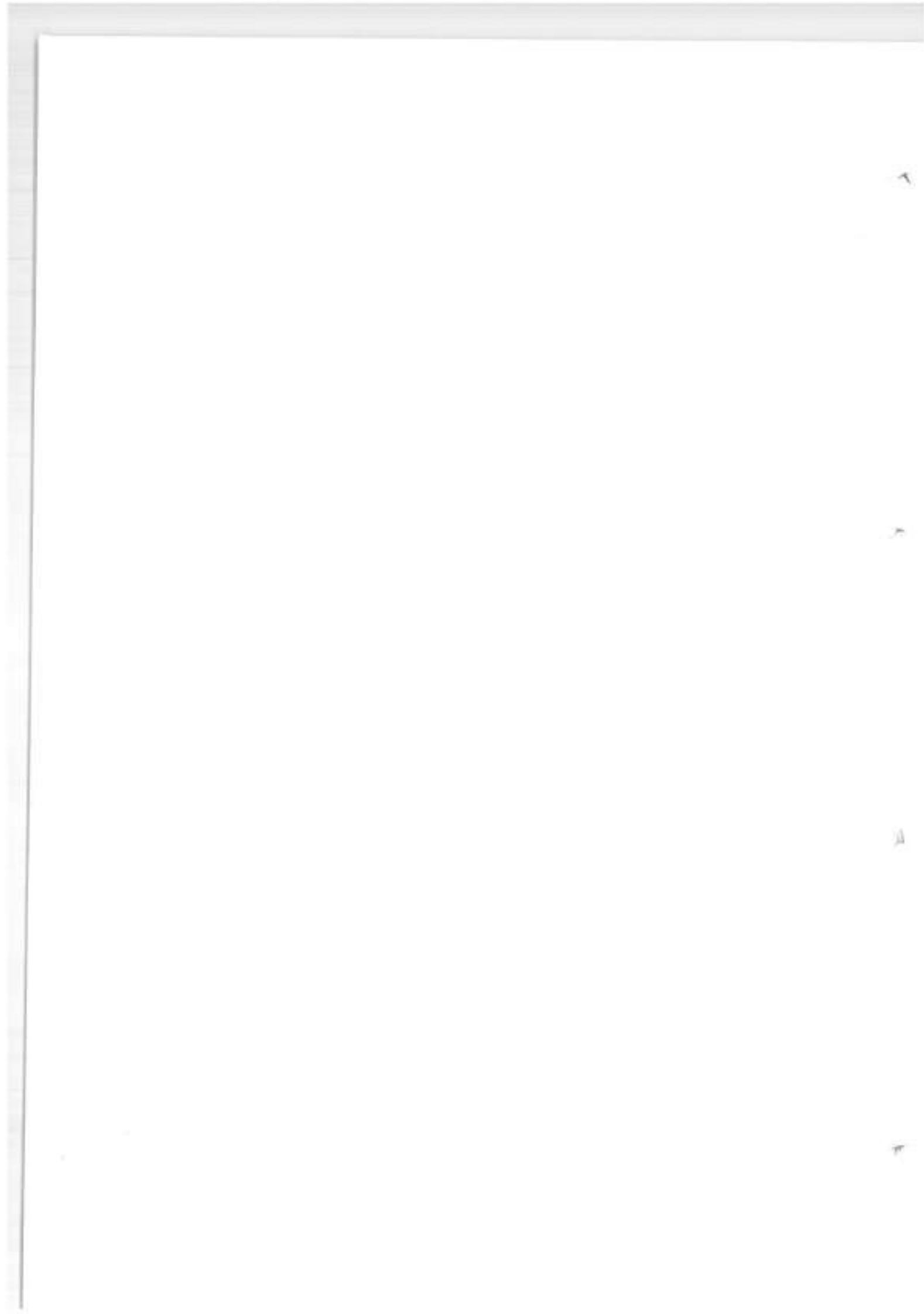
B.V.R. ACHAR
 QUALIFIED PERSON



Copy forwarded for information and necessary action to:

1. The Agent, A Narraim Iron ore mine of M/s Vedanta limited, Megalahalli Complex, Bheemasandra, Chitradurga District, Karnataka State-577520,
2. The Agent, John Mines, Medikeripura Village, Singera Post Chitradurga District, Karnataka State-577541
3. The Manager, A Narraim Iron ore mine of M/s Vedanta limited, Megalahalli Complex, Bheemasandra, Chitradurga District, Karnataka State-577520,
4. The Manager, John Mines, Medikeripura Village, Singera Post Chitradurga District, Karnataka State-577541


 Director of Mines Safety/ದಿನಾ ಸುರಾ ನೆರವು,
 Bengaluru Region, Southern Zone/ಬೆಂಗಳೂರು ಸಿ.ಇ. ಸಿ.ಜಿ.



Annexure-22a

PRODUCTION DEVELOPMENT PROGRAM -2019-20

Annexure-22a

PRODUCTION DEVELOPMENT PROGRAM -2019-20

| Sections | Iron Ore (+45% Fe) | | | | | | Bauxite Silicious Ore (+35 Fe) | | | | | | BHQ waste | | | | | | Rehandling waste | | | | | | Waste | | | | | | | | |
|----------|--------------------|-----|---------|--------|---------|--------|--------------------------------|-----------------|----------|-------|-----|--------|-----------|-------|-----|--------|----|-----------------|------------------|-------|-----|--------|----|-----------------|----------|-------|-----|--------|----|-----------------|--------------------|-----|---------|
| | Area | | | Volume | | | BD | Quantity tonnes | Area sqm | Intha | Mtr | Cu Mtr | Area sqm | Intha | Mtr | Cu Mtr | BD | Quantity tonnes | Area sqm | Intha | Mtr | Cu Mtr | BD | Quantity tonnes | Area sqm | Intha | Mtr | Cu Mtr | BD | Quantity tonnes | Total Waste tonnes | | |
| | sqm | Mtr | cu Mtr | sqm | Mtr | cu Mtr | | | | | | | | | | | | | | | | | | | | | | | | | | sqm | Mtr |
| 2A-2A' | 123.2 | 50 | 61600 | 3 | 184800 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 2-B' | 1290 | 50 | 64500 | 3 | 191500 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 3A-3A' | 454 | 50 | 22700 | 3 | 68100 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 4-4' | 170 | 50 | 8500 | 3 | 25500 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Total | | | 157,200 | | 471,900 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 203,700 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 203,700 |

PRODUCTION DEVELOPMENT PROGRAM -2020-21

| PRODUCTION DEVELOPMENT PROGRAM -2020-21 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--------------------|-----|----------|--------|---------|--------|--------------------------------|-----|--------|--------|-----|--------|-----------|-----|--------|--------|-----|--------|------------------|-----|--------|--------|-----|--------|-------|-----|--------|---------|---|---|-----------------|--------------------|--|
| Sections | Iron Ore (+45% Fe) | | | | | | Bauxite Silicious Ore (+35 Fe) | | | | | | BHQ waste | | | | | | Rehandling waste | | | | | | Waste | | | | | | | | |
| | Area | | | Volume | | | Area | | | Volume | | | Area | | | Volume | | | Area | | | Volume | | | Area | | | Volume | | | Quantity tonnes | Total Waste tonnes | |
| | sqm | Mtr | Cu Mtr | sqm | Mtr | Cu Mtr | sqm | Mtr | Cu Mtr | sqm | Mtr | Cu Mtr | sqm | Mtr | Cu Mtr | sqm | Mtr | Cu Mtr | sqm | Mtr | Cu Mtr | sqm | Mtr | Cu Mtr | sqm | Mtr | Cu Mtr | | | | | | |
| 1A-1A' | 1124 | 50 | 56200 | 3 | 168600 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 2-B' | 4220 | 50 | 211000 | 3 | 633000 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 3A-2A' | 5302 | 50 | 265100 | 3 | 795300 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 1-B' | 4121 | 50 | 206150 | 3 | 618450 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 3A-3A' | 1749 | 50 | 87450 | 3 | 262350 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 4-A' | 358 | 50 | 17900 | 3 | 53700 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 4A-4A' | 658 | 50 | 32900 | 3 | 98700 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 4-A' | 845 | 50 | 42250 | 3 | 126750 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 5A-5A' | 721 | 50 | 36050 | 3 | 108150 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 6-A' | 812 | 50 | 40600 | 3 | 121800 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 6A-6A' | 526 | 50 | 26300 | 3 | 78900 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 7-A' | 735 | 50 | 36750 | 3 | 110250 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 7A-7A' | 921 | 50 | 46050 | 3 | 138150 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 8-A' | 864 | 50 | 43200 | 3 | 129600 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 8A-8A' | 1245 | 50 | 62250 | 3 | 186750 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 8-A' | 406 | 50 | 20300 | 3 | 60900 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 9A-9A' | 628 | 50 | 31400 | 3 | 94200 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 10A-10A' | 430 | 50 | 21500 | 3 | 64500 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 10A-10A' | 212 | 50 | 10600 | 3 | 31800 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 11A-11A' | 117 | 50 | 5850 | 3 | 17550 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 12A-12A' | 0 | 50 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 13A-13A' | 1417 | 50 | 70850 | 3 | 212550 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 13A-13A' | 1340 | 50 | 67000 | 3 | 201000 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| TOTAL | 3115.5 | | 355825.8 | | 4674750 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | 150900 | | | 487430 | | | 68450 | | | 95700 | | | 115384 | | | 1370 | | | 728150 | | | | | | 1237855 | | | 1903629 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

SRIPAD PUJAR

Y.R. ACHAR

Annexure-22b

PRODUCTION DEVELOPMENT PROGRAM - 2021-22

| Scenarios | Iron Ore (+45% Fe) | | | | | Hematite Siliceous Ore (+35 Fe) | | | | | BHQ waste | | | | | Rehandling waste | | | | | Waste | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------|--------------------|--------------|------------------|----|--------------------|---------------------------------|--------------|------------------|-----|--------------------|-------------|--------------|------------------|-----|--------------------|------------------|--------------|------------------|-----|--------------------|-------------|--------------|------------------|-----|--------------------|-----------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | Area
sqm | Infla
Mtr | Volume
Cu Mtr | BD | Quantity
tonnes | Area
sqm | Infla
Mtr | Volume
Cu Mtr | BD | Quantity
tonnes | Area
sqm | Infla
Mtr | Volume
Cu Mtr | BD | Quantity
tonnes | Area
sqm | Infla
Mtr | Volume
Cu Mtr | BD | Quantity
tonnes | Area
sqm | Infla
Mtr | Volume
Cu Mtr | BD | Quantity
tonnes | Total Waste
tonnes | | | | | | | | | | | | | | | | | | | | |
| South Block | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1A-1A' | 48 | 50 | 2400 | 3 | 7200 | 171 | 50 | 8550 | 2.7 | 23085 | 0 | 50 | 0 | 2.2 | 18810 | 0 | 50 | 0 | 1.2 | 0 | 43 | 50 | 2250 | 1.7 | 3825 | 22635 | | | | | | | | | | | | | | | | | | | | |
| 2-2' | 165 | 50 | 2100 | 3 | 15300 | 0 | 50 | 0 | 2.7 | 0 | 0 | 50 | 0 | 2.2 | 0 | 193 | 50 | 9550 | 1.2 | 11590 | 0 | 50 | 0 | 1.7 | 0 | 11590 | | | | | | | | | | | | | | | | | | | | |
| 2A-2A' | 350 | 50 | 17950 | 3 | 53850 | 0 | 50 | 0 | 2.7 | 0 | 0 | 50 | 0 | 2.2 | 0 | 166 | 50 | 8700 | 1.2 | 5960 | 644 | 50 | 32100 | 1.7 | 54740 | 64700 | | | | | | | | | | | | | | | | | | | | |
| 3-3' | 418 | 50 | 20900 | 3 | 62700 | 0 | 50 | 0 | 2.7 | 0 | 0 | 50 | 0 | 2.2 | 0 | 58 | 50 | 2900 | 1.2 | 3480 | 1542 | 50 | 27150 | 1.7 | 131070 | 134590 | | | | | | | | | | | | | | | | | | | | |
| 3A-3A' | 1725 | 50 | 86250 | 3 | 258750 | 0 | 50 | 0 | 2.7 | 0 | 0 | 50 | 0 | 2.2 | 0 | 0 | 0 | 0 | 1.2 | 0 | 2514 | 50 | 125700 | 1.7 | 213660 | 213660 | | | | | | | | | | | | | | | | | | | | |
| 4-4' | 1834 | 50 | 91700 | 3 | 278100 | 189 | 50 | 9450 | 2.7 | 25515 | 0 | 50 | 0 | 2.2 | 26750 | 21 | 50 | 1050 | 1.2 | 1260 | 2002 | 50 | 100100 | 1.7 | 179170 | 192220 | | | | | | | | | | | | | | | | | | | | |
| 4A-4A' | 2627 | 50 | 131350 | 3 | 394050 | 0 | 50 | 0 | 2.7 | 0 | 0 | 50 | 0 | 2.2 | 0 | 62 | 50 | 3100 | 1.2 | 8720 | 3038 | 50 | 151900 | 1.7 | 258230 | 261990 | | | | | | | | | | | | | | | | | | | | |
| 5-5' | 1595 | 50 | 30750 | 3 | 230250 | 0 | 50 | 0 | 2.7 | 0 | 0 | 50 | 0 | 2.2 | 0 | 191 | 50 | 9550 | 1.2 | 11660 | 4648 | 50 | 152400 | 1.7 | 395680 | 406540 | | | | | | | | | | | | | | | | | | | | |
| 5A-5A' | 1302 | 50 | 65100 | 3 | 195300 | 252 | 50 | 12600 | 2.7 | 34020 | 117 | 50 | 5850 | 2.2 | 27720 | 1886 | 50 | 9450 | 1.2 | 89160 | 3921 | 50 | 196250 | 1.7 | 335785 | 350465 | | | | | | | | | | | | | | | | | | | | |
| 6-6' | 150 | 50 | 7500 | 3 | 22500 | 90 | 50 | 2500 | 2.7 | 6750 | 0 | 50 | 0 | 2.2 | 3500 | 0 | 50 | 0 | 1.2 | 0 | 401 | 50 | 30050 | 1.7 | 34085 | 39585 | | | | | | | | | | | | | | | | | | | | |
| 6A-6A' | 1927 | 50 | 96350 | 3 | 289050 | 671 | 50 | 33550 | 2.7 | 90585 | 0 | 50 | 0 | 2.2 | 15810 | 1708 | 50 | 85480 | 1.2 | 102480 | 2254 | 50 | 362700 | 1.7 | 436360 | 623880 | | | | | | | | | | | | | | | | | | | | |
| 7-7' | 610 | 50 | 30500 | 3 | 91500 | 862 | 50 | 43100 | 2.7 | 116370 | 119 | 50 | 5950 | 2.2 | 94810 | 205 | 50 | 10150 | 1.2 | 12180 | 6890 | 50 | 344500 | 1.7 | 595650 | 692650 | | | | | | | | | | | | | | | | | | | | |
| 7A-7A' | 587 | 50 | 49350 | 3 | 148050 | 0 | 50 | 0 | 2.7 | 0 | 0 | 50 | 0 | 2.2 | 0 | 215 | 50 | 10750 | 1.2 | 12960 | 8213 | 50 | 410680 | 1.7 | 608105 | 711005 | | | | | | | | | | | | | | | | | | | | |
| 8-8' | 166 | 50 | 18450 | 3 | 55350 | 252 | 50 | 12600 | 2.7 | 34020 | 160 | 50 | 8000 | 2.2 | 27720 | 382 | 50 | 19100 | 1.2 | 22920 | 5954 | 50 | 197700 | 1.7 | 506090 | 556790 | | | | | | | | | | | | | | | | | | | | |
| 8A-8A' | 1786 | 50 | 89300 | 3 | 267900 | 0 | 50 | 0 | 2.7 | 0 | 0 | 50 | 0 | 2.2 | 0 | 236 | 50 | 11800 | 1.2 | 14160 | 5846 | 50 | 302100 | 1.7 | 496910 | 511070 | | | | | | | | | | | | | | | | | | | | |
| 9-9A' | 2794 | 50 | 139550 | 3 | 418650 | 0 | 50 | 0 | 2.7 | 0 | 1421 | 50 | 71050 | 2.2 | 0 | 474 | 50 | 23700 | 1.2 | 28440 | 4521 | 50 | 126690 | 1.7 | 384385 | 412755 | | | | | | | | | | | | | | | | | | | | |
| 10-10' | 1869 | 50 | 94450 | 3 | 283350 | 1116 | 50 | 55800 | 2.7 | 150660 | 6 | 50 | 300 | 2.2 | 127500 | 0 | 50 | 0 | 1.2 | 0 | 4072 | 50 | 300800 | 1.7 | 341020 | 341020 | | | | | | | | | | | | | | | | | | | | |
| 10A-10A' | 1956 | 50 | 97800 | 3 | 293400 | 1006 | 50 | 50300 | 2.7 | 135810 | 0 | 50 | 0 | 2.2 | 110660 | 99 | 50 | 2960 | 1.2 | 3540 | 4925 | 50 | 246250 | 1.7 | 426360 | 549120 | | | | | | | | | | | | | | | | | | | | |
| 11-11' | 2459 | 50 | 122900 | 3 | 368850 | 0 | 50 | 0 | 2.7 | 0 | 0 | 50 | 0 | 2.2 | 0 | 0 | 50 | 0 | 1.2 | 0 | 4621 | 50 | 231050 | 1.7 | 592785 | 592785 | | | | | | | | | | | | | | | | | | | | |
| 11A-11A' | 2472 | 50 | 123600 | 3 | 370800 | 0 | 50 | 0 | 2.7 | 0 | 0 | 50 | 0 | 2.2 | 0 | 0 | 50 | 0 | 1.2 | 0 | 4621 | 50 | 231050 | 1.7 | 592785 | 592785 | | | | | | | | | | | | | | | | | | | | |
| 12-12' | 691 | 50 | 34550 | 3 | 103650 | 46 | 50 | 2300 | 2.7 | 6210 | 0 | 50 | 0 | 2.2 | 0 | 0 | 50 | 0 | 1.2 | 0 | 2174 | 50 | 108700 | 1.7 | 184790 | 184790 | | | | | | | | | | | | | | | | | | | | |
| 12A-12A' | 0 | 50 | 0 | 3 | 0 | 612 | 50 | 30900 | 2.7 | 82620 | 0 | 50 | 0 | 2.2 | 5660 | 0 | 50 | 0 | 1.2 | 0 | 628 | 50 | 31400 | 1.7 | 53380 | 58440 | | | | | | | | | | | | | | | | | | | | |
| 13-13' | 222 | 50 | 11100 | 3 | 33300 | 0 | 50 | 0 | 2.7 | 0 | 0 | 50 | 0 | 2.2 | 0 | 0 | 50 | 0 | 1.2 | 0 | 821 | 50 | 41050 | 1.7 | 66785 | 120920 | | | | | | | | | | | | | | | | | | | | |
| 13A-13A' | 691 | 50 | 34550 | 3 | 103650 | 34 | 50 | 1700 | 2.7 | 4950 | 0 | 50 | 0 | 2.2 | 0 | 0 | 50 | 0 | 1.2 | 0 | 954 | 50 | 47700 | 1.7 | 81090 | 84820 | | | | | | | | | | | | | | | | | | | | |
| 14-14' | 386 | 50 | 19300 | 3 | 57900 | 0 | 50 | 0 | 2.7 | 0 | 0 | 50 | 0 | 2.2 | 0 | 0 | 50 | 0 | 1.2 | 0 | 945 | 50 | 47250 | 1.7 | 80125 | 80134 | | | | | | | | | | | | | | | | | | | | |
| 14A-14A' | 738 | 50 | 36900 | 3 | 110700 | 0 | 50 | 0 | 2.7 | 0 | 0 | 50 | 0 | 2.2 | 0 | 0 | 50 | 0 | 1.2 | 0 | 968 | 50 | 49900 | 1.7 | 84836 | 84917 | | | | | | | | | | | | | | | | | | | | |
| 15-15' | 1406 | 50 | 74800 | 3 | 224400 | 0 | 50 | 0 | 2.7 | 0 | 0 | 50 | 0 | 2.2 | 0 | 0 | 50 | 0 | 1.2 | 0 | 0 | 50 | 0 | 1.7 | 0 | 457 | | | | | | | | | | | | | | | | | | | | |
| TOTAL | 32511 | | 1628850 | | 4876654 | | | 263050 | | 710235 | | | 106850 | | 578710 | | | 272700 | | 137793 | | | 4057350 | | 6897495 | 7803995 | | | | | | | | | | | | | | | | | | | | |
| North Block | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16A-16A' | 277 | 50 | 13850 | 3 | 41550 | 0 | 50 | 0 | 2.7 | 0 | 0 | 50 | 0 | 2.2 | 0 | 0 | 50 | 0 | 1.2 | 0 | 0 | 50 | 0 | 1.7 | 0 | 0 | | | | | | | | | | | | | | | | | | | | |
| 17-17' | 410 | 50 | 20500 | 3 | 61500 | 0 | 50 | 0 | 2.7 | 0 | 0 | 50 | 0 | 2.2 | 0 | 0 | 50 | 0 | 1.2 | 0 | 0 | 50 | 0 | 1.7 | 0 | 0 | | | | | | | | | | | | | | | | | | | | |
| 17A-17A' | 895 | 50 | 44750 | 3 | 134250 | 0 | 50 | 0 | 2.7 | 0 | 0 | 50 | 0 | 2.2 | 0 | 0 | 50 | 0 | 1.2 | 0 | 0 | 50 | 0 | 1.7 | 0 | 0 | | | | | | | | | | | | | | | | | | | | |
| 18-18' | 045 | 50 | 47250 | 3 | 141750 | 0 | 50 | 0 | 2.7 | 0 | 0 | 50 | 0 | 2.2 | 0 | 0 | 50 | 0 | 1.2 | 0 | 0 | 50 | 0 | 1.7 | 0 | 0 | | | | | | | | | | | | | | | | | | | | |
| 18A-18A' | 2587 | 50 | 129000 | 3 | 387000 | 0 | 50 | 0 | 2.7 | 0 | 0 | 50 | 0 | 2.2 | 0 | 0 | 50 | 0 | 1.2 | 0 | 0 | 50 | 0 | 1.7 | 0 | 0 | | | | | | | | | | | | | | | | | | | | |
| 19-19' | 1409 | 50 | 74800 | 3 | 224400 | 0 | 50 | 0 | 2.7 | 0 | 0 | 50 | 0 | 2.2 | 0 | 0 | 50 | 0 | 1.2 | 0 | 62 | 50 | 3100 | 1.7 | 3270 | 5270 | | | | | | | | | | | | | | | | | | | | |
| 19A-19A' | 3565 | 50 | 188250 | 3 | 564750 | 0 | 50 | 0 | 2.7 | 0 | 0 | 50 | 0 | 2.2 | 0 | 0 | 50 | 0 | 1.2 | 0 | 2574 | 50 | 128700 | 1.7 | 218790 | 218790 | | | | | | | | | | | | | | | | | | | | |
| TOTAL | 10754 | | 537700 | | 1613100 | 5241 | | 263050 | | 710235 | | | 106850 | | 578710 | | | 272700 | | 137793 | | | 131900 | | 6897495 | 224068 | | | | | | | | | | | | | | | | | | | | |
| G.Total (South + North) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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FEASIBILITY STUDY REPORT

1. General Mine description.

Vedanta Limited (Formerly known as Sesa Sterlite Ltd / Sesa Goa Ltd) is having a Mining Lease No. 2677 in the Forest land for mining of Iron Ore near Megalahalli & other villages, Chitradurga and Holalkere taluks, Chitradurga district. The lease was first granted in 1952 and the last (fourth) renewal of the lease was executed on 02.02.2015 for twenty years w.e.f. 28.10.2012 over an area of 160.59 ha.

2. Exploration- pitting/trenching/drilling.

Lessee has drilled 650 core holes with a total meterage of 71083.55m till date. The details of all drilled bore holes are below:

| Year | Type | Bore Hole ID | Nos. | Depth (m) |
|--------------|------|----------------------|------------|-----------------|
| 1994-1995 | Core | NM-1 to NM-4 | 4 | 188 |
| | DTH | D-1 to D-86 | 86 | 3257 |
| 1998-1999 | DTH | D-87 to D-129 | 43 | 1900 |
| 1999-2000 | DTH | D-130 to D-167 | 38 | 2432 |
| 2001-2002 | DTH | D-168 to D-188 | 21 | 1090 |
| 2004-2005 | Core | NM-5 to NM-39 | 35 | 3111 |
| | DTH | D-189 to D-203 | 15 | 927 |
| 2005-2006 | Core | NM-40 to NM-51 | 12 | 1015 |
| | DTH | D-204 to D-237 | 34 | 2772 |
| 2008-2009 | R.C. | ANRC-1 to ANRC-137 | 137 | 15065 |
| 2009-2010 | Core | ANDD-138 to ANDD 199 | 62 | 8040.55 |
| 2012-2013 | Core | ANDD-200 to ANDD 220 | 21 | 5964.70 |
| 2015-2016 | Core | ANDD-221 to ANDD 314 | 96 | 13300 |
| 2017-2018 | Core | ANDD-315 to ANDD 330 | 14* | 2795 |
| 2018-2019 | Core | ANDD-331 to ANDD 347 | 17 | 3950.2 |
| 2019-2020 | Core | ANDD-348 to ANDD 362 | 15 | 5276.10 |
| TOTAL | | | 650 | 71083.55 |

* Borehole nos. 316 & 319 were not drilled.


SRIPAD PUJAR


B.V.R. ACHAR

3. **Reserve assessment-sampling, chemical analysis, recovery with cut – off grade & tonnage factor method of assessment.**

Resource/reserves are updated using latest exploration data based on the UNFC guidelines by cross sectional method. Geological cross sections are prepared at 50m interval. Sectional areas are calculated, and cross-sectional areas are multiplied by sectional influence and the volume of the individual lithology was arrived. The area of individual litho units in each cross section is calculated separately.

Hematitic Siliceous Ore of +35% Fe was considered earlier in resources category (331), however, in light of new threshold limit of IBM it is now categorized under Proved Mineral Reserves (111).

Proved Mineral Reserves (111) are estimated based on the data of G-I level of exploration (up to 50x50m grid interval) without projecting depth limits beyond the borehole bottom and lateral extensions of extreme boreholes. The maximum and minimum depth considered as per boreholes drilled in respect of proved ore is 960 above MSL and 640 above MSL respectively.

Recovery is considered as 100% for iron ore and as no intercalations are present in ore zone. Hematic siliceous ore is also having a recovery of 100% wrt both +10mm Cal ore and -10mm fines, which is detailed below.

| Siliceous Ore | Sample 1 | | Sample 1A | | Sample 2 | | Sample 2A | | Average | |
|---------------|----------|-------|-----------|-------|----------|-------|-----------|-------|---------|-------|
| | Size% | Fe% | Size% | Fe% | Size% | Fe% | Size% | Fe% | Size% | Fe% |
| +10mm | 19.57 | 47.85 | 19.96 | 50.24 | 24.53 | 46.17 | 29.33 | 46.64 | 23.35 | 47.53 |
| -10mm | 80.43 | 36.53 | 80.04 | 36.94 | 75.47 | 37.33 | 70.67 | 37.39 | 76.65 | 37.02 |
| Total | 100 | 38.74 | 100 | 39.60 | 100 | 39.50 | 100 | 40.10 | 100 | 39.49 |

Hematic siliceous ore of +10mm Cal ore will be sold directly as it is of +45% and -10mm fines will be blended with high grade ore fines and marketed to major steel producers like JSW as it will result in better quality wrt Mn, Alumina & Phosphorus content.

Mineral blocked in the areas of safety zone of 7.5m along the boundary (**Feasibility Mineral Resources-211**) is estimated separately which is not minable as no common boundary working permission is present.

Pit slopes will be maintained at 40° wrt horizontal as per local lithology which exhibits more compactness in depth and in line with the practice of surrounding mining areas like RPC. This has decreased the ore blocked due to pit limit. However, to confirm this pit design parameters, pit slope study will be conducted by the expert nodal agencies like NIRM and a report will be submitted to IBM soon.

Inferred Mineral Resources (333) are estimated below proved level based on geological extension of the individual lithology where borehole data is present.

The tonnage is arrived by multiplying volume by its bulk density. Exploration data generated from Diamond Core drilling was used. Bulk density considered for iron ore is 3.0 ton/cum, 2.70 ton/cum for siliceous ore and 1.70 ton/cum for waste.

Resources and Reserves in million tonnes as on 31.01.2020

| Category | UNFC | Normal Iron Ore | Grade (Threshold at Fe +45%) | Hematitic Siliceous Ore | Grade (Threshold at Fe +35%) |
|-----------------------------------|------|-----------------|------------------------------|-------------------------|------------------------------|
| A. Total Mineral Reserves | | | Average 51.67% Fe | | Average 38.02% Fe |
| Proved Mineral Reserve | 111 | 101.664 | | 27.142 | |
| Probable Mineral Reserve | 122 | - | | - | |
| B. Remaining Resources | | | | - | |
| Feasibility Mineral Resource | 211 | 0.983 | | 9.534 | |
| Prefeasibility Mineral | 221 | - | | - | |
| Measured Mineral Resource | 331 | 0.032 | | 5.784 | |
| Indicated Mineral Resource | 332 | - | | - | |
| Inferred Mineral Resource | 333 | 3.882 | | 1.391 | |
| Reconnaissance Mineral | 334 | - | | - | |
| Sub Total | | 4.897 | | 16.709 | |
| Total Reserves + Resources | | 106.561 | | 43.851 | |

4. **Production schedule-mine capacity, total handling/ROM ore & OB/waste handling,rate of production,dilution,recovary grade control /blending.**

Max production program proposed is 7.20 MTPA for the final year of this plan period. To maintain the consistency of the quality of ore throughout the life of the mine and conservation of the mineral resources, mine is being worked at both blocks (South & North) simultaneously.

Hematic siliceous ore of +10mm Cal ore will be sold directly as it is of +45% and -10mm fines will be blended with high grade ore fines and marketed to major steel producers like JSW as it will result in better quality wrt Mn, Alumina & Phosphorus content.

Summary of Production / Development

| Year | ROM-Iron Ore -Tonnes | | | Total waste
(OB/SB+ BHQ
+ Rehandled
waste) | ROM/
Waste
Ratio |
|----------|-----------------------|---------------------------------------|-----------|---|------------------------|
| | Normal Ore
+45% Fe | Hematitic
Siliceous Ore
+35% Fe | Total | | |
| 2019-20* | 471,900 | -- | 471,900 | 205,700 | 1: 0.44 |
| 2020-21 | 5,482,200 | 407,430 | 5,889,630 | 2,495,745 | 1: 0.49 |
| 2021-22 | 6,489,750 | 710,235 | 7,199,985 | 8,028,058 | 1: 1.12 |

Note: *Production program for 2019-20 is -0.472 MT as 4.427 MT of ore has already been produced upto Jan 31st 2020.

5. **Mining method- bench dimensions, slope angle, stripping ratio & drilling, mining & transport equipment/Machinery.**

It is proposed to operate the mine by mechanized open-cast mining method in two shifts. Mining will be carried out in both the blocks. The benches will be made with a height of 7m and width will be more than 8m. The existing pit will be worked by advancing the benches across the strike direction. The produced ore will be transported through 35 tons capacity dumpers to the Crushing/Screening plant to get the end products like calibrated lumps (+10mm-30mm) and fines (-10mm). The waste will be dumped again through dumpers systematically in SE part of the lease (D3 and D4) where already waste dump is present.

The existing already deployed machineries are sufficient to handle the proposed production and development. Hence, no additional deployment of machinery is envisaged. The details of the existing machineries to be deployed in this plan period are given below.

| Sr. No | Equipment / Machinery | Manufacturer | No. of units | Engine H P | Capacity |
|--------|---|---------------|--------------|------------|---------------------|
| 1 | Hydraulic | CAT 330 | 2 | 220 | 1.65cum |
| | Excavators | Volvo 460 | 1 | 316 | 2.45cum |
| | (Total 8 nos.) | Volvo 700 | 5 | 424 | 4.0cum |
| 2 | Wheel Loaders | CAT/Volvo | 9 | 243 | 3.1cum |
| 3 | Wagon drill | Atlas Capeo | 1 | 25 | 20m/hr |
| 4 | Ripper Dozer | D9R | 3 | 428 | - |
| 5 | Dozer | D6R | 1 | 199 | - |
| 6 | Dumpers | Volvo | 35 | 405 | 35 tons |
| 7 | Crushing/Screening Plant with generator | Power Screen | 4 | | 1x1000 and 3x500tph |
| 8 | Proposed beneficiation Plant | -- | 1 | - | 500tph |
| 9 | Water Tanker | TATA | 4 | 130 | 8000 ltrs |
| 10 | Jeeps / Service Vehicles | Mahindra/Tata | 7 | 70 | |

6. Benefication-crushing/manual dressing, sorting, sizing & washing.

The mined ROM is crushed and screened in the existing dry processing plants for size separation as per buyer's requirement. These will be used to treat Hematitic siliceous ore (+35% Fe) and lumps (+10mm) will be sold as it is and fines (-10mm) will be blended with high grade ore, as and when required.

Existing setup: Ore produced from the mine is segregated in four crushing/screening plants (1x1000tph and 3x500tph) to bifurcate ore according to size gradation. ROM is fed to either fixed/mobile plant. The material in fixed plant is directly fed to the vibro grizzly (screen) and +70mm & -70mm will be separated. The separated +70mm material is sent to primary jaw crusher (36" x 20") where it is crushed and sent to primary screen. The separated -70 mm material from vibro grizzly is sent to primary screen where the material gets separates into 10mm, 10 to 40mm and +40 mm. The -10 mm material is directly sent to product bunker. The +10 -40mm material is sent to the secondary screen. The material of +40mm is sent to cone crusher where it gets crushed and is sent to secondary screen where it separates materials into 10mm, 10 to 40mm lumps. Materials of -10 fines and 10 to 40 mm lumps are stacked separately.

7. **Marketing –type of commodity with use, prospective buyers, present sale price & forecasts.**

The Iron ore produced in the lease will be supplied to local steel / pig iron / sponge iron / pellet / sinter plants. The buyers are procuring ore (fines and calibrated ore) of +45% Fe grade. Hematitic siliceous ore (+35% Fe) will be dry screened and +10mm Cal ore will be sold directly as +45% and -10mm fines will be blended with high grade ore fines and marketed to major steel producers like JSW as it will result in better quality wrt Mn, Alumina & Phosphorus content.

The average market price (ex-mine) for Iron ore of +45% Fe is around Rs. 1220/- per ton. Hence the mine is economically viable.

The details of prospective buyer's requirement are as below:

| Buyer | Category | Grade | Use |
|--|----------------------|---|--------------------------------------|
| Pig Iron Division of Sesa Goa Ltd and others like- JSW/ BMM, Prakash Sponge etc. | Cal. Ore of -40+6 mm | Fe 54-62%
Mn <2.7%
MnO<3.3%
Al ₂ O ₃ <2% | Pig Iron/Sponge for Steel Production |
| JSW/BMM etc. | Fines of -10mm | Fe 50-60%
Mn <2.7%
MnO<3.3%
Al ₂ O ₃ <2% | Sinter plant/ pellets and others. |

8. **Infrastructure-road, power source, labour supply and skill:**

The mine is having required infrastructural facilities and is well connected by a good motorable road. All plants etc are operated by diesel generators.

9. **Environmental requirements-EIA&EMP, mine closure and reclamation plan, sustainable development strategy etc.**

EIA studies and EMP including socio-economic impact, rehabilitation of project affected persons, waste disposal/reclamation detailed land use data were carried out by a reputed environmental consultancy firm and Environmental clearance is taken. A progressive mine closure plan is enclosed in the Mining Plan.

10. **Others like legal factors like tribal issues, national parks etc.**
Not applicable
11. **Economic evaluation-capital cost, production & transportation costs, royalty & other taxes, the availability of financing & profits to indicate that the mine is technically and economically viable under foreseeable operating scenario.**

It is an operating mine being run by lessee's own funds. The operating costs is given below.

Cost of production (Rs/tonne)

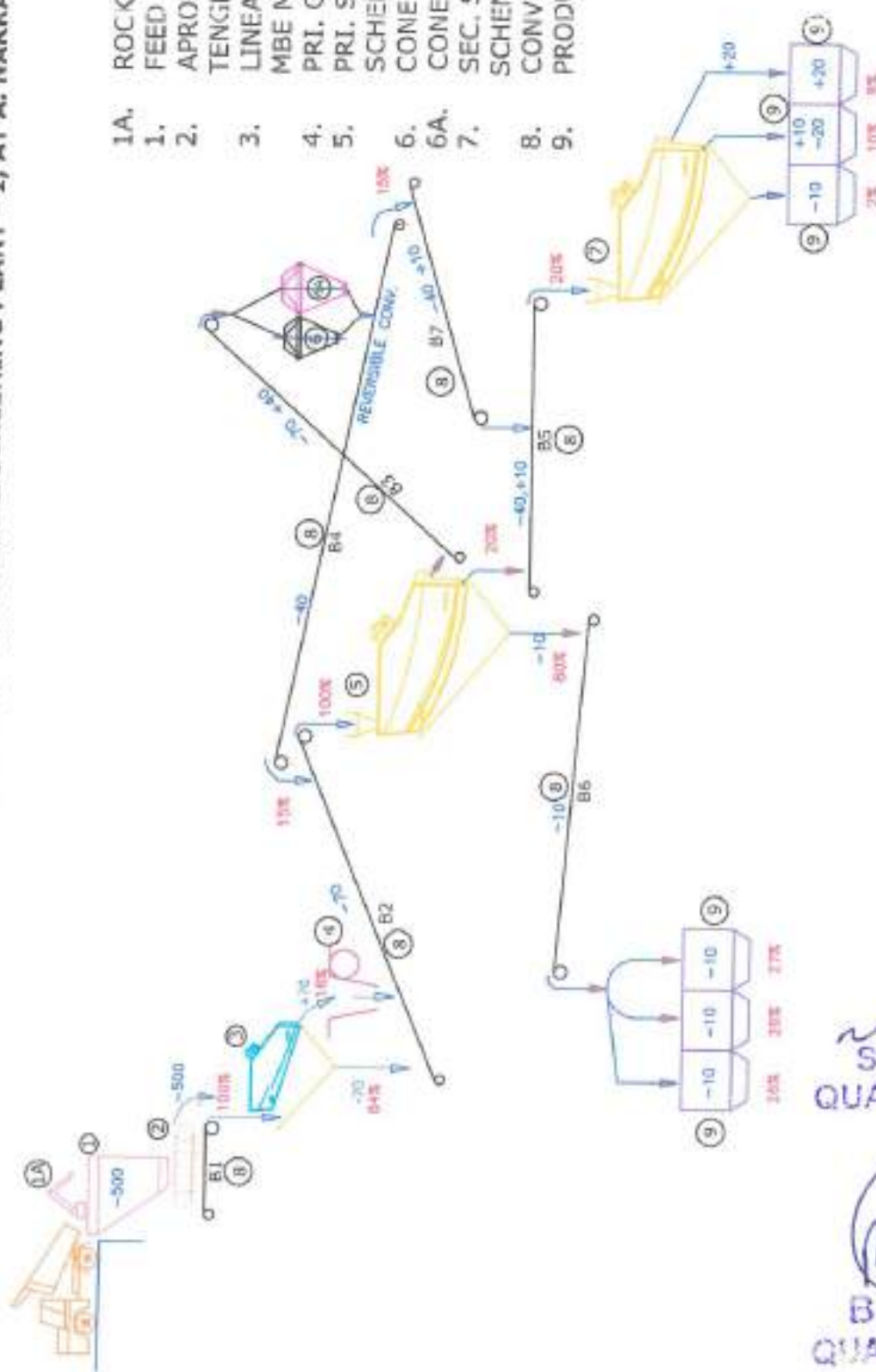
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|-------------------------|------------|
| 1) Direct Cost: | |
| a) Exploration | 0 |
| b) Mining | 230 |
| c) Beneficiation | 67 |
| 2) Over head cost | - |
| 3) Depreciation | 59 |
| 4) Interest | |
| 5) Royalty & Forest | - |
| 6) Taxes | |
| 7) Dead rent | |
| 8) Others -NMET+DMF+SPV | 192 |
| Total | 548 |

The Iron ore produced in the lease will be supplied to local steel / pig iron / sponge iron / pellet / sinter plants. The buyers are procuring ore (fines and calibrated ore) of +45% Fe grade. Hematitic siliceous ore (+35 % Fe) will be dry screened and +10mm Cal ore will be sold directly as +45% and -10mm fines will be blended with high grade ore fines and marketed to major steel producers like JSW as it will result in better quality wrt Mn, Alumina & Phosphorus content.

The cost of production is Rs. 548 per ton. Apart from this, Royalty of Rs. 183 (15% of Rs.1220) will add upto the total cost at Rs.731/ton. However, the average market price (ex-mine) is around Rs. 1220/- per ton for Iron ore of +45% Fe. Hence the mine is economically viable.

NPV of the mine at the proposed production program of 4.51 million TPA will be Rs. 36,478 lakhs. and IRR will be around 62% considering a profit of around Rs.489/tonne.

FLOW SHEET FOR 1000TPH DRY CRUSHING & SCREENING PLANT - 1, AT A. NARRAIN MINE, CHITRADURGA.,



- 1A. ROCK-BREAKER.
1. FEED HOPPER.
2. APRON FEEDER 1.4 x 3.2 C/C.
3. TENGLE MAKE AC1250.
4. LINEAR. GRIZZLY 1.8 x 5.0 mts S.D.
5. MBE MAKE.
6. PRI. CRUSHER CJ 211 1.1x0.7 mts.
- 6A. PRI. SCREEN 8'X20', BANANA SCHENCK MAKE.
7. CONE CRUSHERS -H2800-1NOS.
8. CONE CRUSHER 44SBS-1NOS.
9. SEC. SCREEN 8'x20', BANANA SCHENCK MAKE.
10. CONVEYOR BELTS.
11. PRODUCT BUNKERS. 6 nos.

ANNEXURE 24

Srihad Pujar
SRIHAD PUJAR
QUALIFIED PERSON

B.V.R. Achar
B.V.R. ACHAR
QUALIFIED PERSON



An ISO 9001:2015
OHSAS 18001:2007

METAMORPHOSISSM

LABORATORY PRIVATE LIMITED

thought.....process.....reality!!

TEST REPORT

AMBIENT AIR QUALITY DATA

1. Name of the Project : Vedanta Limited Iron Ore Mine (ML-2677)
2. Location Name : Core Zone - Main Haulage Road - Shift - 1
3. Name of the project Proponent: M/s. Vedanta Limited, Megahadli Office Complex, Bhicamsamudra, Chitradurga, Karnataka.
4. Month of sampling : January - 2020
5. Duration of sampling : 8 hours
6. Date of reporting : 10.03.2020

| Parameter | PM ₁₀
µg/m ³ | PM _{2.5}
µg/m ³ | NO ₂
µg/m ³ | SO ₂
µg/m ³ |
|-------------------|---|--|---|---|
| Sample no. | MGI-485043/01
MGI-485099/01
MGI-480861/01
MGI-494885/01
MGI-485026/01
MGI-485607/01
MGI-480856/01 | PT0790819/01
PT0790823/01
PT0812661/01
PT0812651/01
PT0812671/01
PT0790843/01
PT0789940/01 | 10193101/01
10193264/01
10193288/01
11193433/01
11193449/01
11193537/01
11194290/01 | 10193102/01
10193265/01
10193289/01
11193434/01
11193450/01
11193538/01
11194411/01 |
| Date of Sampling | (chronologically date wise) | (chronologically date wise) | (chronologically date wise) | (chronologically date wise) |
| 06.01.2020 | 41.6 | 20.8 | 21.7 | 14.9 |
| 07.01.2020 | 38.1 | 19.9 | 23.4 | 13.0 |
| 13.01.2020 | 32.5 | 20.6 | 19.7 | 13.6 |
| 14.01.2020 | 33.3 | 19.4 | 22.1 | 13.6 |
| 20.01.2020 | 43.9 | 22.6 | 25.1 | 14.0 |
| 21.01.2020 | 45.8 | 22.0 | 27.7 | 14.9 |
| 27.01.2020 | 39.3 | 24.2 | 28.5 | 13.7 |
| 28.01.2020 | 36.7 | 18.1 | 26.4 | 13.8 |
| Protocol / Method | IS:5182 (Part 23) - Gravimetric method | MLPE/SOP/44 - Gravimetric method | IS:5182 (Part 6) - Jacob and Hochheiser method | IS:5182 (Part 2) - Improved West and Gaeke method |
| NAAQ Standards | 100 | 60 | 80 | 80 |

Note: The tests marked with an * are not accredited by NABL. The result & inference pertains to the sample tested only and parameters as per the requirement of the client. BDL: Below Detection Limit; NA: Not Analyzed; ND: Not Detected; NS: No Sample.

| | |
|---------------------|--|
| INFERENCE | As per CPCB Standards Report Status: All values are within the prescribed standards. |
| Sample Collected By | M/s. METAMORPHOSIS Laboratory Private Limited, Bengaluru |

** End of Report **

Authorized Signatory

Laboratory Head
Dr. Shanth A. Thimmaiah

SRIPAD PUJAR
QUALIFIED PERSON

B.V.R. ACHAR
QUALIFIED PERSON



Recognized through Gazette
Notification of MoEF & CC, GOI,
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BTM Layout II Stage, Behind Central Silk Board,
Bengaluru - 560068, Karnataka, India, Telefax: +91.80.26783006
Email: mail@metamorphosis-india.com

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TEST REPORT

AMBIENT AIR QUALITY DATA

1. Name of the Project : Veekanta Limited Iron Ore Mine (ML-2677)
2. Location Name : Core Zone - Main Haulage Road - Shift - 2
3. Name of the project Proponent : M/s. Veekanta Limited, Megalohalli Office Complex,
Bheemasamudra, Chitradurga, Karnataka.
4. Month of sampling : January - 2020
5. Duration of sampling : 8 hours
6. Date of reporting : 10.02.2020

| Parameter | PM ₁₀
µg/m ³ | PM _{2.5}
µg/m ³ | NO ₂
µg/m ³ | SO ₂
µg/m ³ |
|-------------------|---|--|--|---|
| Sample no. | MGI-485643/01 | PT0790824/01 | 10193083/01 | 10193084/01 |
| | MGI-480659/01 | PT0790801/01 | 10193103/01 | 10193104/01 |
| | MGI-491277/01 | PT0789917/01 | 10193266/01 | 10193267/01 |
| | MGI-485635/01 | PT0793500/01 | 10193290/01 | 10193291/01 |
| | MGI-485624/01 | PT0435624/01 | 11193435/01 | 11193436/01 |
| | MGI-485421/01 | PT0790806/01 | 11193451/01 | 11193452/01 |
| | MGI-491262/01 | PT0789944/01 | 11193539/01 | 11193540/01 |
| | (chronologically date wise) | (chronologically date wise) | (chronologically date wise) | (chronologically date wise) |
| Date of Sampling | | | | |
| 06.01.2020 | 40.1 | 17.3 | 20.3 | 13.8 |
| 07.01.2020 | 36.2 | 18.7 | 21.2 | 13.4 |
| 13.01.2020 | 36.4 | 20.3 | 20.5 | 13.4 |
| 14.01.2020 | 34.5 | 21.9 | 22.5 | 13.7 |
| 20.01.2020 | 43.0 | 18.2 | 23.0 | 14.2 |
| 21.01.2020 | 43.9 | 23.3 | 26.3 | 14.6 |
| 27.01.2020 | 41.7 | 24.1 | 24.9 | 14.6 |
| 28.01.2020 | 33.8 | 18.0 | 27.8 | 14.2 |
| Protocol / Method | IS:5182 (Part 2)-
Gravimetric method | MLPL/SDP/44 -
Gravimetric method | IS:5182 (Part 6) -
Jacob and
Hochheiser method | IS:5182
(Part 2) - Improved
West and Giese method |
| NAAQ Standards | 100 | 60 | 80 | 80 |

Note: The tests marked with an * are not accredited by NABL. The result & inference pertains to the sample tested only and parameters as per the requirement of the client. BDL: Below Detection Limit; NA: Not Analyzed; ND: Not Detected; NS: No Sample

INFERENCE: As per CPCB Standards Report Status: All values are within the prescribed standards.

Sample Collected By: M/s. METAMORPHOSIS Laboratory Private Limited, Bengaluru

** End of Report **

Authorized Signatory

(Signature)

Laboratory Head
Dr. Shanth A. Thimmaiah



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TEST REPORT

AMBIENT AIR QUALITY DATA

1. Name of the Project : Vedanta Limited Iron Ore Mine (ML2677)
2. Location Name : Core Zone - Loading Point - Shift - 1
3. Name of the project Proponent : M/s. Vedanta Limited, Megaladalli Office Complex, Bhoomasatradra, Chikradurga, Karnataka
4. Month of sampling : January - 2020
5. Duration of sampling : 8 hours
6. Date of reporting : 10.02.2020

| Parameter | PM ₁₀
µg/m ³ | PM _{2.5}
µg/m ³ | NO ₂
µg/m ³ | SO ₂
µg/m ³ |
|-------------------|--|--|--|---|
| Sample no. | MGF485629/01 | PT0718478/01 | 10193093/01 | 10192694/01 |
| | MGF485623/01 | PT0790826/01 | 10193256/01 | 10193257/01 |
| | MGF485605/01 | PT0718492/01 | 10193280/01 | 10193281/01 |
| | MGF485627/01 | PT0793496/01 | 11193437/01 | 11193438/01 |
| | MGF485433/01 | PT0790836/01 | 11193465/01 | 11193466/01 |
| | MGF485424/01 | PT0812690/01 | 11193529/01 | 11193530/01 |
| | MGF485414/01 | PT0790841/01 | 1119445B/01 | 1119447B/01 |
| Date of Sampling | (chronologically date wise) | (chronologically date wise) | (chronologically date wise) | (chronologically date wise) |
| 06.01.2020 | 44.7 | 27.0 | 28.7 | 15.5 |
| 07.01.2020 | 47.8 | 26.7 | 29.4 | 15.2 |
| 13.01.2020 | 53.3 | 28.8 | 25.1 | 12.3 |
| 14.01.2020 | 55.3 | 30.9 | 21.8 | 15.8 |
| 20.01.2020 | 55.6 | 34.9 | 29.0 | 13.3 |
| 21.01.2020 | 51.9 | 30.5 | 33.3 | 11.5 |
| 27.01.2020 | 46.7 | 29.5 | 33.4 | 13.0 |
| 28.01.2020 | 39.7 | 23.4 | 28.0 | 14.3 |
| Protocol / Method | IS:5182 (Part 23) - Gravimetric method | MLPL/SOP/44 - Gravimetric method | IS:5182 (Part 6) - Jacob and Hochheiser method | IS:5182 (Part 2) - Improved West and Gaeke method |
| NAAQ Standards | 100 | 60 | 80 | 80 |

Note: The tests marked with an * are not accredited by NABL. The result & inference pertains to the sample tested only and parameters as per the requisition of the client. BD/L: Below Detection Limit; NA: Not Analysed; ND: Not Detected; NS: No Sample

| | |
|---------------------|--|
| INFERENCE | As per CPCB Standards Report Status: All values are within the prescribed standards. |
| Sample Collected By | M/s. METAMORPHOSIS Laboratory Private Limited, Bengaluru |

** End of Report **

Authorized Signatory

Laboratory Head
Dr. Shanth A. Thimmaiah



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TEST REPORT

AMBIENT AIR QUALITY DATA

1. Name of the Project : Vedanta Limited Iron Ore Mine (ML-2677)
2. Location Name : Core Zone - Loading Point - Shift - 2
3. Name of the project Proponent : M/s. Vedanta Limited, Megahalli Office Complex,
Bheemasamudra, Chitradurga, Karnataka State.
4. Month of sampling : January - 2020
5. Duration of sampling : 8 hours
6. Date of reporting : 10.02.2020

| Parameter | PM ₁₀
µg/m ³ | PM _{2.5}
µg/m ³ | NO ₂
µg/m ³ | SO ₂
µg/m ³ |
|-------------------|--|--|--|---|
| Sample no. | MGF-485611/01 | PT0790830/01 | 10193079/01 | 10193080/01 |
| | MGF-485658/01 | PT0718008/01 | 10193095/01 | 10193096/01 |
| | MGF-491293/01 | PT0812678/01 | 10193258/01 | 10193259/01 |
| | MGF-485647/01 | PT0790840/01 | 10193282/01 | 10193283/01 |
| | MGF-485423/01 | PT0792373/01 | 11193439/01 | 11193440/01 |
| | MGF-485425/01 | PT0812688/01 | 11193467/01 | 11193468/01 |
| | MGF-485416/01 | PT0793487/01 | 11193531/01 | 11193532/01 |
| Date of Sampling | (chronologically date wise) | (chronologically date wise) | (chronologically date wise) | (chronologically date wise) |
| 06.01.2020 | 34.7 | 17.9 | 24.3 | 14.3 |
| 07.01.2020 | 45.0 | 22.8 | 19.1 | 14.0 |
| 13.01.2020 | 22.2 | 15.1 | 19.2 | 14.0 |
| 14.01.2020 | 24.9 | 13.5 | 22.7 | 14.3 |
| 20.01.2020 | 40.5 | 23.8 | 19.7 | 14.1 |
| 21.01.2020 | 50.0 | 30.7 | 21.2 | 14.0 |
| 27.01.2020 | 34.5 | 25.7 | 19.6 | 14.6 |
| 28.01.2020 | 43.5 | 33.8 | 22.9 | 14.6 |
| Protocol / Method | IS:5182 (Part 23) - Gravimetric method | MLPL/SOP/44 - Gravimetric method | IS:5182 (Part 6) - Jacob and Hochheiser method | IS:5182 (Part 2) - Improved West and Gacke method |
| NAAQ Standards | 100 | 60 | 80 | 80 |

Note : The tests marked with an * are not accredited by NABL. The result & inference pertains to the sample tested only and parameters as per the requirement of the client. BD/L: Below Detection Limit; NA: Not Analyzed; ND: Not Detected; NS: No Sample

| | |
|---------------------|--|
| INFERENCE | As per CPCB Standards Report Status: All values are within the prescribed standards. |
| Sample Collected By | M/S. METAMORPHOSIS Laboratory Private Limited, Bengaluru |

** End of Report **

Authorized Signatory

Laboratory Head
Dr. Shanth A. Thimmaiah



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TEST REPORT

AMBIENT AIR QUALITY DATA

1. Name of the Project : Vedanta Limited Iron Ore Mine (ML:2677)
2. Location Name : Core Zone - Ore Stock Area - Shift -I
3. Name of the project Proponent : M/s. Vedanta Limited, Megaladalli Office Complex, Bhuvanagudi, Chitradurga, Karnataka
4. Month of sampling : January - 2020
5. Duration of sampling : 8 hours
6. Date of reporting : 10.02.2020

| Parameter | PM ₁₀
µg/m ³ | PM _{2.5}
µg/m ³ | NO ₂
µg/m ³ | SO ₂
µg/m ³ |
|-------------------|---|--|--|---|
| Sample no. | MGF485618/01 | PT0718608/01 | 10193105/01 | 10193106/01 |
| | MGF485637/01 | PT0790816/01 | 10193268/01 | 10193269/01 |
| | MGF485442/01 | PT0812679/01 | 10193292/01 | 10193293/01 |
| | MGF491273/01 | PT0790839/01 | 11193421/01 | 11193422/01 |
| | MGF485420/01 | PT0793462/01 | 11193445/01 | 11193446/01 |
| | MGF485429/01 | PT0812680/01 | 11193517/01 | 11193518/01 |
| | MGF485436/01 | PT0789902/01 | 11194511/01 | 11194530/01 |
| Date of Sampling | (chronologically
date wise) | (chronologically
date wise) | (chronologically
date wise) | (chronologically
date wise) |
| 06.01.2020 | 39.2 | 26.3 | 27.3 | 13.6 |
| 07.01.2020 | 36.3 | 20.3 | 22.7 | 13.2 |
| 13.01.2020 | 33.4 | 18.7 | 23.1 | 13.7 |
| 14.01.2020 | 33.3 | 19.3 | 22.7 | 13.0 |
| 20.01.2020 | 32.6 | 30.9 | 30.1 | 13.0 |
| 21.01.2020 | 51.3 | 41.5 | 29.4 | 13.9 |
| 27.01.2020 | 32.4 | 13.8 | 23.9 | 14.1 |
| 28.01.2020 | 41.0 | 31.0 | 27.4 | 13.4 |
| Protocol / Method | IS:5182 (Part 23) -
Gravimetric method | MPL/SOP/44 -
Gravimetric method | IS:5182 (Part 6) -
Jacob and Hochheiser
method | IS:5182
(Part 2) - Improved
West and Gricke
method |
| NAAQ Standards | 100 | 60 | 80 | 80 |

Note: The tests marked with an * are not accredited by NABL. The result & inference pertains to the sample tested only and parameters as per the requisition of the client. BDL: Below Detection Limit. NA: Not Analysed. ND: Not Detected. NS: No Sample

| | |
|---------------------|--|
| INFERENCE | As per CPCB Standards Report Status: All values are within the prescribed standards. |
| Sample Collected By | M/s. METAMORPHOSIS Laboratory Private Limited, Bengaluru |

** End of Report **

Authorized Signatory

Laboratory Head
Dr. Shanth A. Thimmaiah



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TEST REPORT

AMBIENT AIR QUALITY DATA

1. Name of the Project : Vedanta Limited Iron Ore Mine (ML-2677)
2. Location Name : Core Zone - Ore Stock Area - Shift -2
3. Name of the project Proponent : M/s. Vedanta Limited, Megaluhalli Office Complex, Bhoomasamudra, Chitradurga, Karnataka.
4. Month of sampling : January - 2020
5. Duration of sampling : 8 hours
6. Date of reporting : 10.02.2020

| Parameter | PM ₁₀
µg/m ³ | PM _{2.5}
µg/m ³ | NO ₂
µg/m ³ | SO ₂
µg/m ³ |
|-------------------|--|--|--|--|
| Sample no. | MGF-485061/01 | PT0790835/01 | 10193085/01 | 10193086/01 |
| | MGF-485051/01 | PT0790831/01 | 10193107/01 | 10193108/01 |
| | MGF-485441/01 | PT0790810/01 | 10193270/01 | 10193271/01 |
| | MGF-485432/01 | PT0793490/01 | 10193294/01 | 10193295/01 |
| | MGF-485422/01 | PT0792370/01 | 11193423/01 | 11193424/01 |
| | MGF-485438/01 | PT0812691/01 | 11193447/01 | 11193448/01 |
| | MGF-485430/01 | PT0812677/01 | 11193519/01 | 11193520/01 |
| | (chronologically date wise) | (chronologically date wise) | (chronologically date wise) | (chronologically date wise) |
| Date of Sampling | | | | |
| 06.01.2020 | 34.5 | 19.3 | 22.9 | 12.6 |
| 07.01.2020 | 28.2 | 15.0 | 29.9 | 11.4 |
| 13.01.2020 | 30.0 | 33.9 | 27.2 | 13.8 |
| 14.01.2020 | 21.6 | 13.8 | 30.2 | 12.2 |
| 20.01.2020 | 42.8 | 23.4 | 25.2 | 11.4 |
| 21.01.2020 | 37.7 | 22.1 | 25.8 | 12.2 |
| 27.01.2020 | 33.8 | 19.7 | 25.8 | 12.7 |
| 28.01.2020 | 40.3 | 21.3 | 24.0 | 11.5 |
| Protocol / Method | IS:5182 (Part 25) - Gravimetric method | MLPL/SOP/44 - Gravimetric method | IS:5182 (Part 6) - Jacob and Hochheiser method | IS:5182 (Part 25) - Improved West and Gaeke method |
| NAAQ Standards | 100 | 60 | 80 | 80 |

Note: The tests marked with * are not accredited by NABL. The result & inference pertains to the sample tested only and parameters as per the requisition of the client. BDL: Below Detection Limit; NA: Not Analysed; ND: Not Detected; NS: No Sample

| | |
|---------------------|--|
| INFERENCE | As per CPCB Standards Report Status: All values are within the prescribed standards. |
| Sample Collected By | M/s. METAMORPHOSIS Laboratory Private Limited, Bengaluru |

** End of Report **

Authorized Signatory

Laboratory Head
Dr. Shanth A. Thimmaiah



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TEST REPORT

AMBIENT AIR QUALITY DATA

1. Name of the Project : Vedanta Limited Iron Ore Mine (ML-2677)
2. Location Name : Core Zone - Unloading Point - Shift - I
3. Name of the project Proponent : M/s. Vedanta Limited., Meghaluli Office Complex,
Bheemasamudra, Chitradurga, Karnataka
4. Month of sampling : January - 2020
5. Duration of sampling : 8 hours
6. Date of reporting : 10.02.2020


| Parameter | PM ₁₀
µg/m ³ | PM _{2.5}
µg/m ³ | NO ₂
µg/m ³ | SO ₂
µg/m ³ |
|-------------------|--|--|--|---|
| Sample no. | MGF48566201 | P1071845301 | 1019369701 | 1019309801 |
| | MGF48540501 | P1081267501 | 1019326001 | 1019326101 |
| | MGF48564801 | P1079368901 | 1019328401 | 1019328501 |
| | MGF48542701 | P1079349701 | 1119342901 | 1119343001 |
| | MGF48541001 | P1079349501 | 1119345301 | 1119345401 |
| | MGF48541201 | P1079348601 | 1119352501 | 1119352601 |
| | MGF48540601 | P1078994601 | 1119443001 | 1119444301 |
| Date of Sampling | (chronologically date wise) | (chronologically date wise) | (chronologically date wise) | (chronologically date wise) |
| 06.01.2020 | 42.9 | 19.4 | 27.7 | 13.1 |
| 07.01.2020 | 35.6 | 21.4 | 31.7 | 14.1 |
| 13.01.2020 | 45.5 | 33.2 | 28.0 | 11.6 |
| 14.01.2020 | 38.7 | 27.7 | 30.5 | 12.8 |
| 20.01.2020 | 45.7 | 24.9 | 30.5 | 13.5 |
| 21.01.2020 | 57.7 | 25.6 | 32.3 | 14.3 |
| 27.01.2020 | 43.6 | 26.1 | 28.6 | 13.7 |
| 28.01.2020 | 54.8 | 20.0 | 27.1 | 13.0 |
| Protocol / Method | IS:5182 (Part 23) - Gravimetric method | MLPL/SOP/44 - Gravimetric method | IS:5182 (Part 6) - Jacob and Hochheiser method | IS:5182 (Part 2) - Improved West and Gaeke method |
| NAAQ Standards | 100 | 60 | 80 | 80 |

Note: The tests marked with an * are not accredited by NABL. The result & inference pertains to the sample tested only and parameters as per the requisition of the client. BDL: Below Detection Limit; NA: Not Analysed; ND: Not Detected; NS: No Sample

| | |
|---------------------|---|
| INFERENCE | As per C.P.B Standards Report Status: All values are within the prescribed standards. |
| Sample Collected By | M/s. METAMORPHOSIS Laboratory Private Limited, Bengaluru |

** End of Report **

Authorized Signatory


Laboratory Head
Dr. Shanth A. Thimmaiah



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TEST REPORT

AMBIENT AIR QUALITY DATA

1. Name of the Project : Vedanta Limited Iron Ore Mine (ML: 2677)
2. Location Name : Core Zone - Unloading Point - Shift - 2
3. Name of the project Proponent : M/s. Vedanta Limited, Megalashalli Office Complex, Bheemmanur, Chitradurga, Karnataka
4. Month of sampling : January - 2020
5. Duration of sampling : 8 hours
6. Date of reporting : 10.02.2020

| Parameter | PM ₁₀
µg/m ³ | PM _{2.5}
µg/m ³ | NO ₂
µg/m ³ | SO ₂
µg/m ³ |
|-------------------|---------------------------------------|--|--|---|
| Sample no. | MGF-491288-01 | PT0790840-01 | 10193081-01 | 10193082-01 |
| | MGF-480897-01 | PT0812672-01 | 10193099-01 | 10193100-01 |
| | MGF-485436-01 | PT0812684-01 | 10193262-01 | 10193263-01 |
| | MGF-485434-01 | PT0793493-01 | 10193286-01 | 10193287-01 |
| | MGF-485608-01 | PT0790838-01 | 11193431-01 | 11193432-01 |
| | MGF-485633-01 | PT0789939-01 | 11193455-01 | 11193456-01 |
| | MGF-485408-01 | PT0793496-01 | 11193527-01 | 11193528-01 |
| Date of Sampling | (chronologically date wise) | (chronologically date wise) | (chronologically date wise) | (chronologically date wise) |
| 06.01.2020 | 33.5 | 16.9 | 23.5 | 13.3 |
| 07.01.2020 | 37.1 | 21.2 | 23.8 | 13.2 |
| 13.01.2020 | 37.1 | 20.4 | 24.9 | 13.7 |
| 14.01.2020 | 47.2 | 29.7 | 28.6 | 13.6 |
| 20.01.2020 | 42.9 | 23.8 | 34.7 | 14.0 |
| 21.01.2020 | 36.1 | 23.2 | 26.4 | 13.9 |
| 27.01.2020 | 42.1 | 22.0 | 22.9 | 13.1 |
| 28.01.2020 | 47.0 | 24.8 | 22.6 | 12.1 |
| Protocol / Method | IS:5182 (Part 2) - Gravimetric method | MLPL/SOP/44 - Gravimetric method | IS:5182 (Part 6) - Jacob and Hochheiser method | IS:5182 (Part 2) - Improved West and Gador method |
| NAAQ Standards | 100 | 60 | 80 | 80 |

Note: The data marked with an * are not accredited by NABL. The result & reference pertains to the sample tested only and parameters as per the requirement of the client. BDL: Below Detection Limit; NA: Not Analysed; ND: Not Detected; NS: No Sample.

| | |
|---------------------|--|
| INFERENCE | As per CPCB Standards Report Status: All values are within the prescribed standards. |
| Sample Collected By | M/s. METAMORPHOSIS Laboratory Private Limited, Bengaluru |

** End of Report **

Authorized Signatory

Laboratory Head
Dr. Shanth A. Thimmaiah



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TEST REPORT

AMBIENT AIR QUALITY DATA

1. Name of the Project : Vedanta Limited Iron Ore Mine (ML:2677)
2. Location Name : Core Zone - MEMC Railway Siding - Shift - 1
3. Name of the project Proponent : M/s. Vedanta Limited, Megaluhalli Office Complex,
Bheemasamudra Chitradurga, Karnataka
4. Month of sampling : January - 2020
5. Duration of sampling : 8 hours
6. Date of reporting : 10.02.2020

| Parameter | PM ₁₀
µg/m ³ | PM _{2.5}
µg/m ³ | NO ₂
µg/m ³ | SO ₂
µg/m ³ |
|-------------------|--|--|--|---|
| Sample no. | MGF-485606/01 | PT0718614/01 | 10193109/01 | 10193110/01 |
| | MGF-485633/01 | PT0718601/01 | 10193272/01 | 10193273/01 |
| | MGF-491274/01 | PT0718497/2 | 10193296/01 | 10193297/01 |
| | MGF-485437/01 | PT0793488/01 | 11193425/01 | 11193426/01 |
| | MGF-485407/01 | PT0718613/01 | 11193457/01 | 11193458/01 |
| | MGF-485411/01 | PT0790830/01 | 11193521/01 | 11193522/01 |
| | MGF-491086/01 | PT0793481/01 | 11194571/01 | 11194590/01 |
| | (chronologically date wise) | (chronologically date wise) | (chronologically date wise) | (chronologically date wise) |
| Date of Sampling | | | | |
| 06.01.2020 | 36.3 | 18.8 | 23.0 | 14.7 |
| 07.01.2020 | 36.9 | 20.5 | 23.5 | 13.4 |
| 13.01.2020 | 35.6 | 20.5 | 23.4 | 13.6 |
| 14.01.2020 | 49.3 | 21.2 | 23.5 | 13.9 |
| 20.01.2020 | 55.1 | 27.6 | 25.6 | 13.7 |
| 21.01.2020 | 51.4 | 35.5 | 26.4 | 14.0 |
| 27.01.2020 | 44.9 | 24.1 | 27.0 | 14.1 |
| 28.01.2020 | 72.7 | 42.6 | 26.4 | 13.5 |
| Protocol / Method | IS:5182 (Part 25) - Gravimetric method | MLPL/SOP/44 - Gravimetric method | IS:5182 (Part 6) - Jacob and Hochheiser method | IS:5182 (Part 2) - Improved West and Gaeke method |
| NAAQ Standards | 100 | 60 | 80 | 80 |

Note: The tests marked with an * are not accredited by NABL. The result & inference pertains to the sample tested only and parameters as per the requirement of the client. BDL: Below Detection Limit; NA: Not Analysed; ND: Not Detected; NS: No Sample.

| | |
|---------------------|--|
| INFERENCE | As per CPCB Standards Report Status: All values are within the prescribed standards. |
| Sample Collected By | M/s. METAMORPHOSIS Laboratory Private Limited, Bengaluru |

** End of Report **

Authorized Signatory

Laboratory Head
Dr. Shanth A. Thimmaiah



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Notification of MoEF & CC, GOI,
vide S.O. 3744 (E) dated
17.10.2019, valid upto 16.10.2024.

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TEST REPORT

AMBIENT AIR QUALITY DATA

1. Name of the Project : Vedanta Limited Iron Ore Mine (ML:2677)
2. Location Name : Core Zone - MEMC Railway Siding - Shift - 2
3. Name of the project Proponent : M/s. Vedanta Limited, Megalohalli Office Complex,
Bhoenasanahalli, Chitradurga, Karnataka
4. Month of sampling : January - 2020
5. Duration of sampling : 8 hours
6. Date of reporting : 10.02.2020

| Parameter | PM ₁₀
µg /m ³ | PM _{2.5}
µg /m ³ | NO ₂
µg /m ³ | SO ₂
µg /m ³ |
|-------------------|--|--|---|---|
| Sample no. | MGF485654/01
MGF485644/01
MGF491275/01
MGF485632/01
MGF485419/01
MGF485418/01
MGF485604/01
(chronologically
date wise) | PT0640507/01
PT0796817/01
PT0718500/01
PT0793492/01
PT0790847/01
PT0718603/01
PT0790808/01
(chronologically
date wise) | 10193087/01
10193111/01
10193274/01
10193298/01
11193427/01
11193459/01
11193523/01
(chronologically
date wise) | 10193088/01
10193112/01
10193275/01
10193299/01
11193428/01
11193460/01
11193524/01
(chronologically
date wise) |
| Date of Sampling | | | | |
| 06.01.2020 | 24.9 | 18.3 | 22.2 | 14.0 |
| 07.01.2020 | 20.3 | 16.9 | 20.7 | 12.8 |
| 13.01.2020 | 48.2 | 24.1 | 22.8 | 13.4 |
| 14.01.2020 | 38.2 | 19.7 | 24.0 | 13.6 |
| 20.01.2020 | 41.3 | 22.0 | 25.4 | 13.8 |
| 21.01.2020 | 43.2 | 25.7 | 25.6 | 14.2 |
| 22.01.2020 | 39.9 | 21.6 | 17.5 | 14.4 |
| 28.01.2020 | 47.0 | 24.0 | 16.4 | 14.4 |
| Protocol / Method | IS:5182 (Part 2) -
Gravimetric method | MLPL/SOP/44 -
Gravimetric method | IS:5182 (Part 6) -
Jacob and Hochheiser
method | IS:5182 (Part 2) -
Improved West and
Gaeke method |
| NAAQ Standards | 100 | 60 | 80 | 80 |

Note: The tests marked with an * are not accredited by NABL. The result & inference pertains to the sample tested only and parameters as per the requisition of the client. BDL: Below Detection Limit; NA: Not Analysed; ND: Not Detected; NS: No Sample.

| | |
|---------------------|---|
| INFERENCE | As per CPCII Standards Report Status: All values are within the prescribed standards. |
| Sample Collected By | M/s. METAMORPHOSIS Laboratory Private Limited, Bengaluru |

** End of Report **

Authorized Signatory

Laboratory Head
Dr. Shanth A. Thimmiah



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TEST REPORT

AMBIENT AIR QUALITY DATA

1. Name of the Project : Vedanta Limited Iron Ore Mine (ML: 2677)
2. Location Name : Core Zone - Fixed crushing cum screening plant - T - Shift - 1
3. Name of the project Proponent : M/s. Vedanta Limited, Megaluhalli Office Complex,
Bhoomasamudra, Chitradurga, Karnataka
4. Month of sampling : January - 2020
5. Duration of sampling : 8 hours
6. Date of reporting : 10.02.2020

| Parameter | PM ₁₀
µg/m ³ | PM _{2.5}
µg/m ³ | NO _x
µg/m ³ | SO ₂
µg/m ³ |
|-------------------|--|--|--|---|
| Sample no. | MGF485646/01 | P1079813/01 | 10193089/01 | 10193090/01 |
| | MGF485652/01 | P1071861/01 | 10193252/01 | 10193253/01 |
| | MGF485620/01 | P10812676/01 | 10193276/01 | 10193277/01 |
| | MGF491276/01 | P10812653/01 | 11193441/01 | 11193442/01 |
| | MGF485625/01 | P10793482/01 | 11193461/01 | 11193462/01 |
| | MGF485636/01 | P10793498/01 | 11193533/01 | 11193534/01 |
| | MGF485638/01 | P10784700/01 | 11194631/01 | 11194658/01 |
| Date of Sampling | (chronologically date wise) | (chronologically date wise) | (chronologically date wise) | (chronologically date wise) |
| 06.01.2020 | 43.1 | 20.3 | 24.0 | 12.9 |
| 07.01.2020 | 35.1 | 18.8 | 21.9 | 13.4 |
| 13.01.2020 | 41.6 | 22.3 | 22.1 | 13.4 |
| 14.01.2020 | 29.3 | 18.9 | 22.9 | 13.9 |
| 20.01.2020 | 57.8 | 22.7 | 24.5 | 14.0 |
| 21.01.2020 | 34.7 | 24.7 | 24.2 | 14.1 |
| 27.01.2020 | 38.1 | 23.8 | 24.9 | 13.7 |
| 28.01.2020 | 58.3 | 30.3 | 27.8 | 14.8 |
| Protocol / Method | IS:5182 (Part 22) - Gravimetric method | MLPL/SOP/44 - Gravimetric method | IS:5182 (Part 6) - Jacob and Hochheiser method | IS:5182 (Part 2) - Improved West and Gaeke method |
| NAAQ Standards | 100 | 60 | 80 | 80 |

Note: The tests marked with an * are not accredited by NABL. The result & inference pertains to the sample tested only and parameters as per the requirement of the client. BDL: Below Detection Limit; NA: Not Analyzed; ND: Not Detected; NS: No Sample

| | |
|---------------------|--|
| INFERENCE | As per CPCB Standards Report Status: All values are within the prescribed standards. |
| Sample Collected By | M/s. METAMORPHOSIS Laboratory Private Limited, Bengaluru |

** End of Report **

Authorized Signatory

(Signature)

Laboratory Head
Dr. Shanth A. Thimmaiah



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TEST REPORT

AMBIENT AIR QUALITY DATA

- | | |
|----------------------------------|---|
| 1. Name of the Project | : Vedanta Limited Iron Ore Mine (ML: 2677) |
| 2. Location Name | : Core Zone - Fixed crushing cum screening plant - 1 - Shift - 2 |
| 3. Name of the project Proponent | : M/s. Vedanta Limited, Meghalalli Office Complex,
Bheemasamudra, Chitradurga, Karnataka |
| 4. Month of sampling | : January - 2020 |
| 5. Duration of sampling | : 8 hours |
| 6. Date of reporting | : 10.02.2020 |

| Parameter | PM ₁₀
µg/m ³ | PM _{2.5}
µg/m ³ | NO ₂
µg/m ³ | SO ₂
µg/m ³ |
|-------------------|--|--|---|---|
| Sample no. | MGE485656/01 | PT0790820/01 | 10193077/01 | 10193078/01 |
| | MGE485669/01 | PT0790828/01 | 10193091/01 | 10193092/01 |
| | MGE480093/01 | PT0812662/01 | 10193254/01 | 10193255/01 |
| | MGE485431/01 | PT0812655/01 | 10193278/01 | 10193279/01 |
| | MGE485435/01 | PT0790839/01 | 11193443/01 | 11193444/01 |
| | MGE485445/01 | PT0789901/01 | 11193463/01 | 11193464/01 |
| | MGE485660/01 | PT0812665/01 | 11193535/01 | 11193536/01 |
| Date of Sampling | (chronologically date wise) | (chronologically date wise) | (chronologically date wise) | (chronologically date wise) |
| 06.01.2020 | 38.6 | 20.0 | 23.5 | 13.5 |
| 07.01.2020 | 36.0 | 17.9 | 23.5 | 13.6 |
| 13.01.2020 | 35.8 | 17.8 | 26.0 | 13.2 |
| 14.01.2020 | 34.5 | 19.4 | 26.2 | 13.6 |
| 20.01.2020 | 38.7 | 21.7 | 22.4 | 13.5 |
| 21.01.2020 | 34.7 | 21.9 | 25.4 | 13.5 |
| 27.01.2020 | 37.8 | 26.7 | 24.0 | 12.7 |
| 28.01.2020 | 44.7 | 32.4 | 27.0 | 13.2 |
| Protocol / Method | IS:5182 (Part 23) - Gravimetric method | MLPL/SOP/44 - Gravimetric method | IS:5182 (Part 6) - Jamb and Hochheiser method | IS:5182 (Part 2) - Improved West and Gaeke method |
| NAAQ Standards | 100 | 60 | 80 | 80 |

Note: The tests marked with an * are not accredited by NABL. The result & inference pertains to the sample tested only and parameters as per the requirement of the client. BDL: Below Detection Limit; NA: Not Analyzed; ND: Not Detected; NS: No Sample.

| | |
|---------------------|--|
| INFERENCE | As per CPCB Standards Report Status: All values are within the prescribed standards. |
| Sample Collected By | M/s. METAMORPHOSIS Laboratory Private Limited, Bengaluru |

** End of Report **

Authorized Signatory

Laboratory Head
Dr. Shunth A. Thimmaiah



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TEST REPORT

AMBIENT AIR QUALITY DATA

1. Name of the Project : Vedanta Limited Iron Ore Mine (ML-2677)
2. Location Name : Buffer Zone - Megalaballi village
3. Name of the project Proponent: M/s. Vedanta Limited, Megalaballi Office Complex, Bhoomasamudra, Chirachargu, Karnataka
4. Month of sampling : January - 2020
5. Duration of sampling : 24 hours
6. Date of reporting : 10.02.2020

| Parameter | PM ₁₀
µg/m ³ | PM _{2.5}
µg/m ³ | NO ₂
µg/m ³ | SO ₂
µg/m ³ |
|------------------|--|--|--|--|
| Sample no. | MCA-485641-01 | PT0796829-01 | 10193204-01 | 10193207-01 |
| | MCA-485640-01 | PT0718477-01 | 10193228-01 | 10193231-01 |
| | MCA-485444-01 | PT0812654-01 | 11193385-01 | 11193388-01 |
| | MCA-483619-01 | PT0812660-01 | 11193403-01 | 11193406-01 |
| | MCA-485645-01 | PT0812657-01 | 11193481-01 | 11193484-01 |
| | MCA-480871-01 | PT0718498-01 | 11193499-01 | 11193502-01 |
| | MCA-480872-01 | PT0718499-01 | 11193500-01 | 11193503-01 |
| | MCA-480873-01 | PT0718500-01 | 11193501-01 | 11193504-01 |
| Date of Sampling | (chronologically date wise) | (chronologically date wise) | (chronologically date wise) | (chronologically date wise) |
| 09.01.2020 | 34.1 | 19.5 | 22.3 | 12.5 |
| 10.01.2020 | 34.4 | 20.0 | 20.5 | 13.0 |
| 16.01.2020 | 37.0 | 20.0 | 25.1 | 12.5 |
| 17.01.2020 | 36.9 | 20.7 | 23.0 | 12.3 |
| 23.01.2020 | 37.8 | 23.2 | 21.9 | 13.2 |
| 24.01.2020 | 39.7 | 21.2 | 20.6 | 12.6 |
| 30.01.2020 | 36.1 | 19.7 | 22.2 | 13.8 |
| 31.01.2020 | 36.6 | 17.9 | 22.6 | 13.1 |
| Proxent / Method | IS:5182 (Part 23) - Gravimetric method | MLPL/SOP/44 - Gravimetric method | IS:5182 (Part 6) - Jacob and Hochheiser method | IS:5182 (Part 2) - Improved West and Clarke method |
| NAAQ Standards | 100 | 60 | 80 | 80 |

Note: The tests marked with an * are not accredited by NABL. The result & inference pertains to the sample tested only and parameters as per the requisition of the client. BD/L: Below Detection Limit; NA: Not Analysed; ND: Not Detected; NS: No Sample

| | |
|---------------------|--|
| INFERENCE | As per CPC B Standards, Report Status: All values are within the prescribed standards. |
| Sample Collected By | M/s. METAMORPHOSIS Laboratory Private Limited, Bengaluru |

** End of Report **

Authorized Signatory

Laboratory Head
Dr. Shanth A. Thimmaiah



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TEST REPORT

AMBIENT AIR QUALITY DATA

1. Name of the Project : Vedanta Limited Iron Ore Mine (ML-2677)
2. Location Name : Buffer Zone - Panigehalli village
3. Name of the project Proponent : M/s. Vedanta Limited, Megalahalli Office Complex,
Bheemasamudra, Chitradurga, Karnataka
4. Month of sampling : January - 2020
5. Duration of sampling : 24 hours
6. Date of reporting : 10/02/2020

| Parameter | PM ₁₀
µg/m ³ | PM _{2.5}
µg/m ³ | NO ₂
µg/m ³ | SO ₂
µg/m ³ |
|-------------------|--|--|--|---|
| Sample no. | MGI-485642/01 | PT0718612/01 | 10193210/01 | 10193213/01 |
| | MGI-485637/01 | PT0718604/01 | 10193234/01 | 10193237/01 |
| | MGI-480864/01 | PT0812689/01 | 11193373/01 | 11193376/01 |
| | MGI-485439/01 | PT0812681/01 | 11193397/01 | 11193400/01 |
| | MGI-485639/01 | PT0812658/01 | 11193469/01 | 11193472/01 |
| | MGI-485635/01 | PT0812663/01 | 11193505/01 | 11193508/01 |
| | MGI-485636/01 | PT0812664/01 | 11193506/01 | 11193509/01 |
| | MGI-485637/01 | PT0812665/01 | 11193507/01 | 11193510/01 |
| Date of Sampling | (chronologically date wise) | (chronologically date wise) | (chronologically date wise) | (chronologically date wise) |
| 09.01.2020 | 37.9 | 24.3 | 22.3 | 12.3 |
| 10.01.2020 | 37.4 | 20.8 | 24.9 | 14.9 |
| 16.01.2020 | 36.6 | 20.2 | 23.6 | 14.3 |
| 17.01.2020 | 38.5 | 22.2 | 24.1 | 14.4 |
| 23.01.2020 | 40.5 | 21.5 | 23.3 | 14.3 |
| 24.01.2020 | 42.9 | 23.5 | 27.4 | 13.7 |
| 30.01.2020 | 38.0 | 21.9 | 24.1 | 13.4 |
| 31.01.2020 | 42.9 | 19.9 | 22.3 | 13.7 |
| Protocol / Method | IS:5182 (Part 23) - Gravimetric method | MLPL/SOP-44 - Gravimetric method | IS:5182 (Part 6) - Jacob and Hochheiser method | IS:5182 (Part 2) - Improved West and Gaeke method |
| NAAQ Standards | 100 | 60 | 80 | 80 |

Note: The tests marked with an * are not accredited by NABL. The results & inference pertains to the sample tested only and parameters as per the regulation of the client. BDL: Below Detection Limit; NA: Not Analyzed; ND: Not Detected; NS: No Sample

| | |
|---------------------|--|
| INFERENCE | As per CPCB Standards Report Status: All values are within the prescribed standards. |
| Sample Collected By | M/S. METAMORPHOSIS Laboratory Private Limited, Bengaluru |

** End of Report **

Authorized Signatory

Laboratory Head
Dr. Shanth A. Thimmaiah



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TEST REPORT

AMBIENT AIR QUALITY DATA

1. Name of the Project : Vedanta Limited Iron Ore Mine (ML-2677)
2. Location Name : Buffer Zone - D-Medikeripura village
3. Name of the project Proponent: M/s. Vedanta Limited, Megaluhalli Office Complex, Bhemesamudra, Chitradurga, Karnataka
4. Month of sampling : January - 2020
5. Duration of sampling : 24 hours
6. Date of reporting : 10.02.2020

| Parameter | PM ₁₀
µg/m ³ | PM _{2.5}
µg/m ³ | NO ₂
µg/m ³ | SO ₂
µg/m ³ |
|-------------------|--|--|--|--|
| Sample no. | MGF48562001 | PT079083201 | 1019321601 | 1019321901 |
| | MGF48562101 | PT071860501 | 1019324001 | 1019324301 |
| | MGF49108401 | PT081266401 | 1119337901 | 1119338201 |
| | MGF48563401 | PT078995701 | 1119340901 | 1119341201 |
| | MGF48565601 | PT079084201 | 1119347501 | 1119347801 |
| | MGF48688001 | PT079080301 | 1119349301 | 1119349601 |
| | MGF48688101 | PT079080401 | 1119349401 | 1119349701 |
| | MGF48688201 | PT079080501 | 1119349501 | 1119349801 |
| Date of Sampling | (chronologically
date wise) | (chronologically
date wise) | (chronologically
date wise) | (chronologically
date wise) |
| 09.01.2020 | 32.9 | 18.1 | 24.3 | 15.1 |
| 10.01.2020 | 39.8 | 21.1 | 26.2 | 15.3 |
| 16.01.2020 | 39.4 | 19.7 | 25.5 | 15.0 |
| 17.01.2020 | 39.5 | 21.1 | 23.0 | 15.4 |
| 23.01.2020 | 39.3 | 20.9 | 21.4 | 14.2 |
| 24.01.2020 | 41.6 | 23.5 | 24.0 | 14.1 |
| 30.01.2020 | 36.6 | 21.3 | 27.3 | 14.6 |
| 31.01.2020 | 35.3 | 21.2 | 27.4 | 15.1 |
| Protocol / Method | IS:5182 (Part 22) -
Gravimetric
method | MLPL-SCN44 -
Gravimetric method | IS:5182 (Part 6) -
Jacob and Hochheiser
method | IS:5182
(Part 2) - Improved
West and Gaeke
method |
| NAAQ Standards | 103 | 60 | 80 | 80 |

Note: The tests marked with an * are not accredited by NABL. The result & inference pertains to the sample tested only and parameters as per the regulation of the client. BDL: Below Detection Limit; NA: Not Analyzed; NR: Not Detected; NS: No Sample

| | |
|---------------------|--|
| INFERENCE | As per CPCB Standards Report Status: All values are within the prescribed standards. |
| Sample Collected By | M/s. METAMORPHOSIS Laboratory Private Limited, Bengaluru |

** End of Report **

Authorized Signatory

Laboratory Head
Dr. Shanth A. Thimmaiah



Recognized through Gazette
Notification of MoEF & CC, GOI,
vide S.O. 3744 (E) dated
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TEST REPORT

AMBIENT AIR QUALITY DATA

1. Name of the Project : Vedanta Limited Iron Ore Mine (ML-2677)
2. Location Name : Buffer Zone - Kemuru village
3. Name of the project Proponent : M/s. Vedanta Limited., Megalaballi Office Complex,
Bheemasamudra, Chitradurga, Karnataka
4. Month of sampling : January - 2020
5. Duration of sampling : 24 hours
6. Date of reporting : 10.02.2020

| Parameter | PM ₁₀
µg /m ³ | PM _{2.5}
µg /m ³ | NO _x
µg /m ³ | SO ₂
µg /m ³ |
|-------------------|--|---|--|---|
| Sample no. | MGF-485617-01 | PT0718602-01 | 10193222-01 | 10193225-01 |
| | MGF-485630-01 | PT0790818-01 | 10193246-01 | 10193249-01 |
| | MGF-491082-01 | PT0812685-01 | 11193391-01 | 11193394-01 |
| | MGF-485631-01 | PT0812656-01 | 11193415-01 | 11193418-01 |
| | MGF-485443-01 | PT0793485-01 | 11193487-01 | 11193490-01 |
| | MGF-485404-01 | PT0790805-01 | 11193511-01 | 11193514-01 |
| | MGF-485405-01 | PT0790806-01 | 11193512-01 | 11193515-01 |
| | MGF-485406-01 | PT0790807-01 | 11193513-01 | 11193516-01 |
| Date of Sampling | (chronologically date wise) | (chronologically date wise) | (chronologically date wise) | (chronologically date wise) |
| 09.01.2020 | 35.7 | 19.0 | 25.3 | 14.6 |
| 10.01.2020 | 42.6 | 23.6 | 22.5 | 15.3 |
| 16.01.2020 | 35.0 | 20.7 | 22.9 | 15.0 |
| 17.01.2020 | 44.8 | 21.7 | 23.0 | 14.7 |
| 23.01.2020 | 38.3 | 20.4 | 27.1 | 14.2 |
| 24.01.2020 | 37.5 | 24.9 | 25.2 | 14.0 |
| 30.01.2020 | 40.8 | 25.0 | 25.7 | 14.8 |
| 31.01.2020 | 34.2 | 20.7 | 23.4 | 15.2 |
| Protocol / Method | IS-5182 (Part 25) - Gravimetric method | MLPL/SOP/44 - Gravimetric method | IS:5182 (Part 01) - Jacob and Hoddeiser method | IS:5182 (Part 2) - Improved West and Gaeke method |
| NAAQ Standards | 100 | 60 | 80 | 80 |

Note: The tests marked with an * are not accredited by NABL. The result & inference pertain to the sample tested only and parameters as per the requirement of the client. BDL: Below Detection Limit; NA: Not Analyzed; ND: Not Detected; NS: No Sample

| | |
|---------------------|--|
| INFERENCE | As per CPCB Standards Report Status: All values are within the prescribed standards. |
| Sample Collected By | M/s. METAMORPHOSIS Laboratory Private Limited, Bengaluru |

** End of Report **

Authorized Signatory

Laboratory Head
Dr. Shanth A. Thimmalah



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TEST REPORT

AMBIENT AIR QUALITY DATA

1. Name of the Project: Vedanta Limited Iron Ore Mine (ML-2677)
2. Location Name: Transport Route Location - Bhoomasamudra Petrol Bunk
3. Name of the project Proponent: M/s. Vedanta Limited, Megaluhalli Office Complex, Bhoomasamudra, Chitradurga, Karnataka
4. Month of sampling: January - 2020
5. Duration of sampling: 24 hours
6. Date of reporting: 10.02.2020

| Parameter | PM ₁₀
µg/m ³ | PM _{2.5}
µg/m ³ | NO ₂
µg/m ³ | SO ₂
µg/m ³ |
|-------------------|---|--|---|---|
| Sample no. | 1079/01
1077/01
1066/01
1061/01
1063/01
1072/01
1013/01 | P10790822/01
P10790821/01
P10789923/01
P10790840/01
P10817687/01
P10817674/01
P10790804/01 | - | - |
| Date of Sampling | (chronologically date wise) | (chronologically date wise) | | |
| 06.01.2020 | 53.3 | 27.2 | -- | -- |
| 07.01.2020 | 46.1 | 23.3 | -- | -- |
| 13.01.2020 | 60.8 | 24.2 | -- | -- |
| 14.01.2020 | 56.1 | 24.5 | -- | -- |
| 20.01.2020 | 42.7 | 26.6 | -- | -- |
| 21.01.2020 | 49.8 | 24.5 | -- | -- |
| 27.01.2020 | 47.0 | 24.2 | -- | -- |
| 28.01.2020 | 63.0 | 27.2 | -- | -- |
| Protocol / Method | IS: 5182 (Part 22) - Gravimetric method | MLPL/SOP/44 - Gravimetric method | IS: 5182 (Part 6) - Jacob and Hochheiser method | IS: 5182 (Part 21) - Improved West and Gaeke method |
| NAAQ Standards | 100 | 60 | 80 | 80 |

Note: The tests marked with an * are not accredited by NABL. The results & inference pertains to the sample tested only and parameters as per the requirement of the client. BD/L: Below Detection Limit; N/A: Not Analysed; ND: Not Detected; NS: No Sample

| | |
|----------------------|--|
| INFERENCE | As per CPCB Standards Report Status: All values are within the prescribed standards. |
| Sample Collected By: | M/s. METAMORPHOSIS Laboratory Private Limited, Bengaluru |

** End of Report **

Authorized Signatory


Laboratory Head
Dr. Shanth A. Thimmaiah



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TEST REPORT

AMBIENT AIR QUALITY DATA

1. Name of the Project : Vedanta Limited Iron Ore Mine (ML2677)
2. Location Name : Transport Route Location - Bommenahalli Village Junction
3. Name of the project Proponent : M/s. Vedanta Limited., Megalahalli Office Complex, Bheemasamudra, Chitradurga, Karnataka State.
4. Month of sampling : January - 2020
5. Duration of sampling : 24 hours
6. Date of reporting : 10.02.2020

| Parameter | PM ₁₀
µg /m ³ | PM _{2.5}
µg /m ³ | NO ₂
µg /m ³ | SO ₂
µg /m ³ |
|-------------------|---|--|--|---|
| Sample no. | 1080/01
1076/01
1064/01
1060/01
1062/01
1075/01
1014/01
(chronologically
date wise) | PT0790812/01
PT0718516/01
PT0793491/01
PT0790845/01
PT0790844/01
PT0793489/01
PT0790809/01
(chronologically
date wise) | — | — |
| Date of Sampling | | | | |
| 06.01.2020 | 41.3 | 23.4 | — | — |
| 07.01.2020 | 42.7 | 22.3 | — | — |
| 13.01.2020 | 60.1 | 28.6 | — | — |
| 14.01.2020 | 58.4 | 25.4 | — | — |
| 20.01.2020 | 53.6 | 27.6 | — | — |
| 21.01.2020 | 24.4 | 16.6 | — | — |
| 27.01.2020 | 53.2 | 25.0 | — | — |
| 28.01.2020 | 55.5 | 29.5 | — | — |
| Protocol / Method | IS:5182 (Part 23) –
Gravimetric method | MIPL/SOP/44 –
Gravimetric
method | IS:5182 (Part 6) –
Jacob and
Hochheiser method | IS:5182 (Part 2) –
Improved West and
Gaeke method |
| NAAQ Standards | 100 | 60 | 80 | 80 |

Note: The tests marked with an * are not accredited by NABL. The result & inference pertains to the sample tested only and parameters as per the requirement of the client. BDL: Below Detection Limit; NA: Not Analyzed; ND: Not Detected; NS: No Sample

| | |
|---------------------|--|
| INFERENCE | As per CPCB Standards Report Status: All values are within the prescribed standards. |
| Sample Collected By | M/s. METAMORPHOSIS Laboratory Private Limited, Bengaluru |

** End of Report **

Authorized Signatory

Shanth

Laboratory Head
Dr. Shanth A. Thimmaiah



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TEST REPORT

AMBIENT AIR QUALITY DATA

1. Name of the Project : Vedanta Limited Iron Ore Mine (ML-2677)
2. Location Name : Transport Route Location - Malagurubatti Junction
3. Name of the project Proponent : M/s. Vedanta Limited, Megalohalli Office Complex, Bhucanasamodra, Chitradurga, Karnataka
4. Month of sampling : January - 2020
5. Duration of sampling : 24 hours
6. Date of reporting : 10.02.2020

| Parameter | PM ₁₀
µg/m ³ | PM _{2.5}
µg/m ³ | NO _x
µg/m ³ | SO ₂
µg/m ³ |
|-------------------|--|--|--|---|
| Sample no. | MGF-485645-01
MGF-485649-01
MGF-485628-01
MGF-485616-01
MGF-485440-01
MGF-485441-01
MGF-485442-01
MGF-485443-01 | PT0718609-01
PT0718607-01
PT0812669-01
PT0812667-01
PT0812673-01
PT0812674-01
PT0812675-01
PT0812675-01 | — | — |
| Date of Sampling | (chronologically date wise) | (chronologically date wise) | | |
| 09.01.2020 | 40.6 | 23.2 | — | — |
| 10.01.2020 | 33.5 | 18.9 | — | — |
| 16.01.2020 | 60.4 | 28.7 | — | — |
| 17.01.2020 | 56.0 | 34.5 | — | — |
| 23.01.2020 | 49.6 | 23.4 | — | — |
| 24.01.2020 | 47.8 | 22.7 | — | — |
| 30.01.2020 | 52.0 | 25.3 | — | — |
| 31.01.2020 | 56.7 | 28.5 | — | — |
| Protocol / Method | IS-5182 (Part 23) – Gravimetric method | MLPL/SOP/44 – Gravimetric method | IS-5182 (Part 6) – Jacob and Hochheiser method | IS-5182 (Part 2) – Improved West and Gaeke method |
| NAAQ Standards | 100 | 60 | 80 | 80 |


Note: The tests marked with 'nd' are not accredited by NABL. The results & inference pertain to the sample tested only and parameters as per the requirement of the client. RDL: Below Detection Limit; NA: Not Analyzed; ND: Not Detected; NS: No Sample.

INFERENCE: As per CPCB Standards Report Status: All values are within the prescribed standards.

Sample Collected By: M/s. METAMORPHOSIS Laboratory Private Limited, Bengaluru

** End of Report **

Authorized Signatory


Laboratory Head
Dr. Shanth A. Thimmaiah



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TEST REPORT

AMBIENT AIR QUALITY DATA

1. Name of the Project : Vedanta Limited Iron Ore Mine (ML-2677)
2. Location Name : Transport Route Location - Hirekandwadi Village
3. Name of the project Proponent: M/s. Vedanta Limited., Megalaballi Office Complex, Bheemasamudra, Chitradurga, Karnataka
4. Month of sampling : January - 2020
5. Duration of sampling : 24 hours
6. Date of reporting : 10.02.2020

| Parameter | PM ₁₀
µg/m ³ | PM _{2.5}
µg/m ³ | NO _x
µg/m ³ | SO ₂
µg/m ³ |
|-------------------|--|--|---|---|
| Sample no. | 1082/01
1083/01
1069/01
1070/01
1065/01
1074/01
1075/01
1075/01 | PT0718610/01
PT0718615/01
PT0812686/01
PT0812682/01
PT0812666/01
PT0790811/01
PT0790812/01
PT0790813/01 | | |
| Date of Sampling | chronologically
date wise | chronologically
date wise | | |
| 09.01.2020 | 34.1 | 18.3 | -- | -- |
| 10.01.2020 | 52.8 | 21.5 | -- | -- |
| 16.01.2020 | 40.2 | 14.7 | -- | -- |
| 17.01.2020 | 30.1 | 16.9 | -- | -- |
| 23.01.2020 | 32.8 | 21.6 | -- | -- |
| 24.01.2020 | 33.0 | 18.4 | -- | -- |
| 30.01.2020 | 51.1 | 17.9 | -- | -- |
| 31.01.2020 | 55.4 | 19.8 | -- | -- |
| Protocol / Method | IS:5182 (Part 23) -
Gravimetric method | MLPL/SOP/44 -
Gravimetric
method | IS:5182 (Part 6) -
Jacob
and
Hochheiser method | IS:5182 (Part 2) -
Improved West and
Gaeke method |
| NAAQ Standards | 100 | 60 | 80 | 80 |

Note: The tests marked with an * are not accredited by NABL. The result & inference pertain to the sample tested only and parameters as per the regulation of the client. BDL: Below Detection Limit; NA: Not Analyzed; ND: Not Detected; NS: No Sample.

| | |
|---------------------|--|
| INFERENCE | As per CPCB Standards Report Status: All values are within the prescribed standards. |
| Sample Collected By | M/S. METAMORPHOSIS Laboratory Private Limited, Bengaluru |

** End of Report **

Authorized Signatory

Laboratory Head
Dr. Shanth A. Thimmaiah



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TEST REPORT

AMBIENT AIR QUALITY DATA

1. Name of the Project : Vedanta Limited Iron Ore Mine (ME:2677)
2. Location Name : Transport Route Location - Circle Gate
3. Name of the project Proponent: M/s. Vedanta Limited., Magalhães Office Complex,
Bheemasantada, Chitradurga, Karnataka
4. Month of sampling : January - 2020
5. Duration of sampling : 24 hours
6. Date of reporting : 10.02.2020

| Parameter | PM ₁₀
µg/m ³ | PM _{2.5}
µg/m ³ | NO _x
µg/m ³ | SO ₂
µg/m ³ |
|------------------|---|--|--|--|
| Sample no. | 1081/01
1078/01
1068/01
1067/01
1071/01
1073/01
1074/01
(chronologically
date wise) | PT0790837/01
PT0790815/01
PT0812683/01
PT0790835/01
PT0812668/01
PT0790807/01
PT0790805/01
(chronologically
date wise) | -- | -- |
| Date of Sampling | 09.01.2020 | 15.1 | -- | -- |
| | 10.01.2020 | 13.3 | -- | -- |
| | 16.01.2020 | 13.6 | -- | -- |
| | 17.01.2020 | 20.3 | -- | -- |
| | 23.01.2020 | 19.2 | -- | -- |
| | 24.01.2020 | 18.5 | -- | -- |
| | 20.01.2020 | 19.5 | -- | -- |
| | 21.01.2020 | 21.0 | -- | -- |
| Protocol/ Method | IS:5182 (Part 2) -
Gravimetric method | MLPL/SOP/44 -
Gravimetric
method | IS:5182 (Part 6) -
Jacob and
Hofmeister method | IS:5182 (Part 2) -
Improved West and
Gaekle method |
| NAAQ Standards | 100 | 60 | 80 | 80 |

Note: The tests marked with an * are not accredited by NABL. The result & inference pertains to the sample tested only and parameters as per the requisition of the client. BDL: Below Detection Limit; NA: Not Analyzed; ND: Not Detected; NS: No Sample.

| | |
|---------------------|--|
| INFERENCE | As per CPCB Standards Report Status: All values are within the prescribed standards. |
| Sample Collected By | M/s. METAMORPHOSIS Laboratory Private Limited, Bengaluru |

** End of Report **

Authorized Signatory

Laboratory Head
Dr. Shanth A. Thimmaiah



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TEST REPORT

AMBIENT NOISE MEASUREMENT

- | | |
|----------------------------------|--|
| 1. Name of the project | : Vedanta Limited Iron Ore Mine (ML-2677) |
| 2. Location name | : Megalahalli Village |
| 3. Name of the project proponent | : M/s. Vedanta Limited, Megalahalli Office
Complex, Bhemasamudra Chitradurga, Karnataka |
| 4. Date of Measurement | : 20.07.2019 |
| 5. Name of instrument | : Digital sound level meter Larson SL-4023 SD & SL Nec Q650063. |
| 6. Date of reporting | : 17.08.2019 |

| Sampling point | Sample no. | Protocol | Result (dB (A)) | | | | | |
|---------------------|------------|------------------|-----------------|------|------|-------|------|-----|
| | | | Day | | | Night | | |
| | | | LMin | LMax | Leq | LMin | LMax | Leq |
| Megalahalli Village | 08191903 | IS:9989
-1981 | 43.3 | 56.6 | 50.7 | - | - | - |


| Limits in dB (A) Leq | | | |
|----------------------|------------------------|-------------------------|----------------------------|
| Area Code | Category of Area/ Zone | Day (6 a.m. to 10 p.m.) | Night (10 p.m. to 6 a. m.) |
| (A) | Industrial Area | 75 | 70 |
| (B) | Commercial Area | 65 | 55 |
| (C) | Residential Area | 55 | 45 |
| (D) | Sensitive Zone | 50 | 40 |

Note: The result & inference pertains to the sample tested only and parameters as per the requisition of the client.

| | |
|---------------------|--|
| INFERENCE | Report Status as per KSPCB Standards: - Values are found within the permissible limits applicable to residential area. |
| Sample Collected By | M/s. METAMORPHOSIS SM Laboratory Private Limited, Bengaluru. |

- **End of Report**

Authorized Signatory


Laboratory Head
Dr. Shanth A. Thimmaiah



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TEST REPORT

AMBIENT NOISE MEASUREMENT

1. Name of the project : Vedanta Limited Iron Ore Mine (ML-2677)
2. Location name : MEMC Railway Siding
3. Name of the project proponent : M/s. Vedanta Limited, Megahallij Office
Complex, Bheemasamudra, Chitradurga, Karnataka
4. Date of Measurement : 29.07.2019
5. Name of instrument : Digital sound level meter Iatron SL 4033 SD & SL No. Q650063
6. Date of reporting : 17.08.2019

| Sampling point | Sample no. | Protocol | Result (dB (A)) | | | | | |
|----------------|------------|------------------|-----------------|------|------|-------|------|-----|
| | | | Day | | | Night | | |
| | | | LMin | LMax | Leq | LMin | LMax | Leq |
| BBH Siding | 08191004 | IS:9089
+1981 | 53.0 | 59.9 | 56.7 | - | - | - |

| Limits in dB (A) Leq | | | |
|----------------------|------------------------|-------------------------|---------------------------|
| Area Code | Category of Area/ Zone | Day (6 a.m. to 10 p.m.) | Night (10 p.m. to 6 a.m.) |
| (A) | Industrial Area | 75 | 70 |
| (B) | Commercial Area | 65 | 55 |
| (C) | Residential Area | 55 | 45 |
| (D) | Sensitive Zone | 50 | 40 |

Note: The result & inference pertains to the sample tested only and parameters as per the requirement of the client.

| | |
|---------------------|---|
| INFERENCE | Report Status as per KSPCB Standards: - Values are found within the permissible limits applicable to commercial area. |
| Sample Collected By | M/s. METAMORPHOSIS SM Laboratory Private Limited, Bengaluru. |

End of Report

Authorized Signatory

Laboratory Head
Dr. Shanth A. Thimmiah



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TEST REPORT

AMBIENT NOISE MEASUREMENT

- | | |
|----------------------------------|---|
| 1. Name of the project | : Vedanta Limited Iron Ore Mine (ML:2677) |
| 2. Location name | : Medikeripura Village |
| 3. Name of the project proponent | : M/s. Vedanta Limited, Megaladshi Office
Complex, Bhennasamudra, Chinnalurga, Karnataka |
| 4. Date of Measurement | : 29.07.2019 |
| 5. Name of instrument | : Digital sound level meter Larson SL 4033 SD & SL No: Q650063. |
| 6. Date of reporting | : 17.08.2019 |

| Sampling point | Sample no. | Protocol | Result (dB (A)) | | | | | |
|----------------------|------------|------------------|-----------------|------|------|-------|------|-----|
| | | | Day | | | Night | | |
| | | | LMin | LMax | Leq | LMin | LMax | Leq |
| Medikeripura Village | 08191905 | IS:9989
-1981 | 50.8 | 57.7 | 53.5 | - | - | - |

| Limits in dB (A) Leq | | | |
|----------------------|------------------------|-------------------------|----------------------------|
| Area Code | Category of Area/ Zone | Day (6 a.m. to 10 p.m.) | Night (10 p.m. to 6 a. m.) |
| (A) | Industrial Area | 75 | 70 |
| (B) | Commercial Area | 65 | 55 |
| (C) | Residential Area | 55 | 45 |
| (D) | Sensitive Zone | 50 | 40 |

Note: The result & inference pertains to the sample tested only and parameters as per the requisition of the client.

| | |
|---------------------|--|
| INFERENCE | Report Status as per KSPCB Standards: - Values are found to be within the permissible limits applicable to residential area. |
| Sample Collected By | M/s. METAMORPHOSIS SM Laboratory Private Limited, Bengaluru. |

End of Report

Authorized Signatory

Laboratory Head
Dr. Shanth A. Thimmaiah



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TEST REPORT

AMBIENT NOISE MEASUREMENT

- | | |
|-----------------------------------|---|
| 1. Name of the project | : Vedanta Limited Iron Ore Mine (ML-2677) |
| 2. Location name | : Tanigehalli Village |
| 3. Name of the project respondent | : M/s. Vedanta Limited, Meghalhalli Office
Complex, Heccepusanodra, Chitradurga, Karnataka |
| 4. Date of Measurement | : 29.07.2019 |
| 5. Name of instrument | : Digital sound level meter Larson SL-4033 SD & SL No: Q650063 |
| 6. Date of reporting | : 17.08.2019 |

| Sampling point | Sample no. | Protocol | Result (dB (A)) | | | | | |
|---------------------|------------|------------------|-----------------|------|------|-------|------|-----|
| | | | Day | | | Night | | |
| | | | LMin | LMax | Leq | LMin | LMax | Leq |
| Tanigehalli Village | 08191906 | IS-9989
-1981 | 42.2 | 59.3 | 52.6 | - | - | - |


| Limits in dB (A) Leq | | | |
|----------------------|------------------------|-------------------------|----------------------------|
| Area Code | Category of Area/ Zone | Day (6 a.m. to 10 p.m.) | Night (10 p.m. to 6 a. m.) |
| (A) | Industrial Area | 75 | 70 |
| (B) | Commercial Area | 65 | 55 |
| (C) | Residential Area | 55 | 45 |
| (D) | Sensitive Zone | 50 | 40 |

Note: The result & inference pertains to the sample tested only and parameters as per the requirement of the client.

| | |
|---------------------|--|
| INFERENCE | Report Status as per KSPCB Standards: - Values are found within the permissible limits applicable to residential area. |
| Sample Collected By | M/s. METAMORPHOSIS SM Laboratory Private Limited, Bengaluru. |

End of Report

Authorized Signatory


Laboratory Head
Dr. Shanth A. Thimmaiah



TC-5841

Environmental & Industrial Research Laboratory

"PRAKRUTI BHAVAN", #200, 1st & 2nd Floor, 40th Main, 1st Cross,
BTM Layout-II Stage, Behind Central Silk Board,
Bengaluru - 560068, Karnataka, India, Telefax: +91.80.26783006
Email: mail@metamorphosis-india.com

An ISO 9001:2015 & OHSAS 18001:2007 Certified Laboratory



AN ISO 9001:2015
OHSAS 18001:2007

METAMORPHOSISSM

LABORATORY PRIVATE LIMITED

thought.....process.....reality!!

Recognized by MoEF & CC and Accredited by NABL

TEST REPORT

AMBIENT NOISE MEASUREMENT

1. Name of the project : Vedanta Limited Iron Ore Mine (ML-2677)
2. Location name : Konanuru Village
3. Name of the project proponent : M/s. Vedanta Limited, Megaluhalli Office
Complex, Bheemasamudra, Chitradurga, Karnataka
4. Date of Measurement : 29.07.2019
5. Name of instrument : Digital sound level meter Lutron SL-4033 SD & SL No: Q650063.
6. Date of reporting : 17.08.2019

| Sampling point | Sample no. | Protocol | Result (dB (A)) | | | | | |
|------------------|------------|------------------|-----------------|------|------|-------|------|-----|
| | | | Day | | | Night | | |
| | | | LMin | LMax | Leq | LMin | LMax | Leq |
| Konanuru Village | 08191907 | IS:9989
-1981 | 36.1 | 51.8 | 44.5 | - | - | - |

| Limits in dB (A) Leq | | | |
|----------------------|------------------------|-------------------------|----------------------------|
| Area Code | Category of Area/ Zone | Day (6 a.m. to 10 p.m.) | Night (10 p.m. to 6 a. m.) |
| (A) | Industrial Area | 75 | 70 |
| (B) | Commercial Area | 65 | 55 |
| (C) | Residential Area | 55 | 45 |
| (D) | Sensitive Zone | 50 | 40 |

Note: The result & inference pertains to the sample tested only and parameters as per the requisition of the client.

| | |
|---------------------|---|
| INFERENCE | Report Status as per KSPCB Standards:- Values are found to be within the permissible limits applicable to residential area. |
| Sample Collected By | M/s. METAMORPHOSIS SM Laboratory Private Limited, Bengaluru. |

End of Report

Authorized Signatory

Laboratory Head
Dr. Shanth A. Thimmaiah



TC-5841

"TRAKRUTIBHAVAN", #200, 1st & 2nd Floor, 40th Main, 1st Cross,
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TEST REPORT

AMBIENT NOISE MEASUREMENT

1. Name of the project : Vedanta Limited Iron Ore Mine (ML/2677)
2. Location name : Sasulu Village
3. Name of the project proponent : M/s. Vedanta Limited, Megalshelli Office
Complex, Bhemesamudra, Chitradurga, Karnataka
4. Date of Measurement : 29.07.2019
5. Name of instrument : Digital sound level meter Larson SL-4053 SD & SL No: Q650063
6. Date of reporting : 17.08.2019

| Sampling point | Sample no. | Protocol | Result (dB (A)) | | | | | |
|----------------|------------|------------------|-----------------|------|------|-------|------|-----|
| | | | Day | | | Night | | |
| | | | LMin | LMax | Leq | LMin | LMax | Leq |
| Sasulu Village | 08191908 | IS:9989
-1981 | 48.1 | 54.1 | 51.7 | - | - | - |

| Limits in dB (A) Leq | | | |
|----------------------|------------------------|-------------------------|---------------------------|
| Area Code | Category of Area/ Zone | Day (6 a.m. to 10 p.m.) | Night (10 p.m. to 6 a.m.) |
| (A) | Industrial Area | 75 | 70 |
| (B) | Commercial Area | 65 | 55 |
| (C) | Residential Area | 55 | 45 |
| (D) | Sensitive Zone | 50 | 40 |

Note: The result & inference pertains to the sample tested only and parameters as per the regulation of the client.

| | |
|---------------------|--|
| INFERENCE | Report Status as per KSPCB Standards: - Values are found within the permissible limits applicable to residential area. |
| Sample Collected By | M/s. METAMORPHOSIS SM Laboratory Private Limited, Bengaluru. |

End of Report

Authorized Signatory

Laboratory Head
Dr. Shanth A. Thimmalah



TC-5841

"PRAKRUTI BHAVAN", #200, 1st & 2nd Floor, 40th Main, 1st Cross,
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LABORATORY PRIVATE LIMITED

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TEST REPORT

AMBIENT NOISE MEASUREMENT

- | | |
|----------------------------------|---|
| 1. Name of the project | 2. Vedanta Limited Iron Ore Mine (ML-2677) |
| 2. Location name | 3. Sirigere village |
| 3. Name of the project proponent | 4. M/s. Vedanta Limited, Megalohalli Office
Complex, Bhramaramudra, Chitradurga, Karnataka |
| 4. Date of Measurement | 5. 29.07.2019 |
| 5. Name of instrument | 6. Digital sound level meter Lutron SL 4033 SD & SL No: Q650063. |
| 6. Date of reporting | 7. 17.08.2019 |

| Sampling point | Sample no. | Protocol | Result (dB (A)) | | | | | |
|------------------|------------|------------------|-----------------|------|------|-------|------|-----|
| | | | Day | | | Night | | |
| | | | LMin | LMax | Leq | LMin | LMax | Leq |
| Sirigere village | 08191910 | IS:9989
-1981 | 49.1 | 58.9 | 52.2 | - | - | - |


| Limits in dB (A) Leq | | | |
|----------------------|------------------------|-------------------------|----------------------------|
| Area Code | Category of Area/ Zone | Day (6 a.m. to 10 p.m.) | Night (10 p.m. to 6 a. m.) |
| (A) | Industrial Area | 75 | 70 |
| (B) | Commercial Area | 65 | 55 |
| (C) | Residential Area | 55 | 45 |
| (D) | Sensitive Zone | 50 | 40 |

Note: The result & inference pertains to the sample tested only and parameters as per the requisition of the client.

| | |
|---------------------|--|
| INFERENCE | Report Status as per KSPCB Standards: - Values are found within the permissible limits applicable to residential area. |
| Sample Collected By | M/s. METAMORPHOSIS SM Laboratory Private Limited, Bengaluru. |

End of Report

Authorized Signatory


Laboratory Head
Dr. Shanth A. Thimmaiah



TC-5841

"PRAKRUTI BHAVAN", #200, 1st & 2nd Floor, 40th Main, 1st Cross,
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Bengaluru - 560068, Karnataka, India, Telefax: +91.80.26783006
Email: mail@metamorphosis-india.com



o/c

sesa goa iron

Mine Code: 30KAR07013
Interim Registration No.: IBM/327/2011

Date: 8th June, 20

To:
Regional Controller of Mines
Indian Bureau of Mines
Bengaluru- 560022

Respected Sir,

Subject: Submission of financial assurance as prescribed under rule 27(1) of MCDR- 2017

Reference: Letter no. 279/25/88/BNG-Vol-VI, dated 28-04-2017 from your good office

With reference to the above subject we are herewith submitting amended Bank Guarantee, Ref No: 1364BGR000431 amounting to Rs.48177000 (Rupees Four crore eighty one lakh seventy seven thousand only) for our M.L. No. 2677 (R.M.I. 2236), Iron Ore Mines for an area of 160.59 Hectares for the year (2017-2022)


Requesting you to kindly return the Bank guarantee submitted earlier with BG number: 1364BGR0004317, Issuance date 14th Dec 2016, of amount Rs.40,14,750 (Rupees Forty Lakh fourteen thousand seven hundred and fifty only), which was submitted along with our Review & Updation of Mining plan for 2017-18 to 2021-22.

Thanking You

For Vedanta Limited

Agent


SRIPATH PUJAR
QUALIFIED PERSON


B.V.R. ACHAR
QUALIFIED PERSON

VEDANTA LIMITED
Sesa Goa Iron Ore, Karnataka
Mugdalaah Office Complex, Hiranayana, Chindrapur, Karnataka - 577 120
T 081 04234000 / 04234001 / 04234002

Registered Office: Vedanta Limited, 34 Floor, 'A' wing, Tata 100, Corporate Avenue, Andraprakash, Chhatrapati Shivaji Maharaj Vastu Sangrahalaya, Mumbai 400005, Maharashtra, India
CIN: L1220MH2012PLC200794



गोवा GOA

DATE 28/11/17 SERIAL NO. 765 VALUE 1000/-
NAME OF PURCHASER ICICI Bank Ltd
RESIDENT OF PANAJI PURPOSE
PLACE OF PANAJI

429851

VENKAT SETHI
CHARTERED ACCOUNTANT (PAST)
UD. NO. 1042/STAMPED/UD/23/2014

PURCHASER SIGN

This forms an integral part of Bank Guarantee No.13648GR0004317 dated December 14, 2016 and amended on May 31, 2017 valued at Rs.48177000.00 (Rupees Four Crore Eighty One Lakhs Seventy Seven Thousand Only) issued by ICICI Bank Limited, having its registered office at ICICI Bank Tower, Near Chakli Circle, Old Padra Road, Vadodara, Gujarat. Pin - 390 007.

For ICICI Bank Limited

Authorized Signatory

RENUKA SHIRODKER
S-13446



For ICICI Bank Limited

Authorized Signatory

Smita Vernekar
V-2054

Sr.No. 043033

BANK GUARANTEE
ICICI Bank Limited
 (Incorporated in India)


BG Number: 1364BGR0004317
Amendment Date: 31-05-2017

To
 THE REGIONAL CONTROLLER OF MINES,
 INDIAN BUREAU OF MINES,
 BENGALURU - INDIA

Sub: Amendment of Bank Guarantee No 1364BGR0004317 Dtd 14-12-2016 for INR 4014750.00

Current Bank guarantee details -

| BG Currency | BG Amt | BG Expiry Date | BG Claim Expiry Date |
|-------------|------------|----------------|----------------------|
| INR | 4014750.00 | 31-03-2022 | 31-03-2022 |

At the request of VEDANTA LIMITED-SESA IRON ORE we hereby amend above mentioned Bank Guarantee as follows:

* The amount of Bank guarantee has been amended to INR 48177000.00 (INDIAN RUPEE Four Crore Eighty One Lakh Seventy Seven Thousand Only)

All other terms and conditions of the original Bank guarantee remain unchanged. This letter forms an integral part of the original guarantee referred above and may be kept attached thereto.

Notwithstanding anything contained here in above

1) Our liability under this Bank guarantee shall not exceed INR 48177000.00 (INDIAN RUPEE Four Crore Eighty One Lakh Seventy Seven Thousand Only)

2) This Bank Guarantee shall be valid upto 31-03-2022

3) We shall be liable to pay the amount under this Bank guarantee or part thereof only if we receive (if you serve upon us) a written claim or demand under this guarantee on or before 31-03-2022 at ICICI Bank Ltd, Shops No.2/3, Gr.Flr., Sesa Ghor, Patto Plaza, Panaji, Goa Panaji-Goa.

Date: 31-05-2017

For ICICI BANK LIMITED

Authorized signatories

Signature :

Signature :

Name :

RENUKA SHIRODKER

Name :

Sanjay Verma

Signature Code :

8-13446

Signature Code :

V-2054



Regd. Office: ICICI Bank Tower, Near Chakli Circle, Old Padre Road, Vadodra, Gujarat Pin - 390 007, Phone : 0265-6722222, Fax: 0265-2341661, E-mail: corporate@icicibank.com

Regd. Office : ICICI Bank Ltd, ICICI Bank Tower, Near Chakli Circle, Old Padre Road, Vadodra, Pin code - 390 007, Gujarat
 Phone : 0265 - 6722222, Fax - 0265 - 6722020 CIN : L65190GJ1994PLC021012



Ref: 0364BGR0004317
Date: 01-06-2017

REGIONAL CONTROLLER OF MINES,
BUREAU OF MINES,
BHRU

Re: Issuance of Bank Guarantee

Sir/Madam,

We find the attached Bank Guarantee issued by us favoring yourself on
of:
SESA LIMITED-SESA IRON ORE
LEHAR, 20
PANAJI - 000000
INDIA

We find the details mentioned below.

| Guarantee No. &
of Issue | Expiry Date | Claim Expiry
Date | Amount of
Bank Guarantee |
|------------------------------|-------------|----------------------|-----------------------------|
| 0364BGR0004317
14-12-2016 | 31-03-2022 | 31-03-2022 | INR 48177000.00 |

We confirm that the officials who have signed the above Bank Guarantee are
authorized to sign such documents on behalf of ICICI Bank Limited. You may
verify genuineness of the Bank Guarantee from any branch of ICICI Bank in
your own interest.

In the event of invocation, we request you to please ensure compliance with
terms and conditions of the bank guarantee in order to ensure timely
payment. You are requested to ensure special care inter alia with respect to
following in the invocation claim letter-

- Bank Guarantee Number
- Expiry/Claim Expiry date
- Claim amount
- Designated Bank branch for submission of invocation claim
- Any declaration/certification that may be required as part of the
guarantee text
- Any other requisite document including the original Bank Guarantee

Yours faithfully,
ICICI Bank Limited
Authorized Signatory
DEEPAK KUSHWAHA
K-7850



ICICI Bank Limited
Shops No.2 & 3, Gr.Fr.,
Sesa Ghor, Pato Plaza,
Panaji, Goa-403001

Website: www.icicibank.com
CN: 146190GJ1094PLC021012

Regd. Office: ICICI Bank Tower, Near Chakri Circle,
Old Padra Road, Vadodara,
Gujarat, Pin - 390 007
Corp. Office: ICICI Bank Towers, Bandra-Kurla
Complex, Mumbai-400 051, India