REVIEW & UPDATION OF MINING PLAN

(Under Rule 17 of MCR, 2016)

Including

PROGRESSIVE MINE CLOSURE PLAN

(Under Rule 23 of MCDR, 2017)

OF

ZAMBLIDADGA DONGOR IRON & MANGANESE ORE MINE

(M. L. No. 3/FeMn/79)

MINE CODE: 40GOA02002

LEASE PERIOD: 50 years (13-12-1979 to 12-12-2029)

VILLAGE : CAUREM

TALUKA : QUEPEM

DISTRICT : SOUTH GOA

STATE : GOA

LESSEE: LATE SHRI. NARAINA SINAI QUIRTONIM

(Represented by Smt. Pradnya Zoivant Pai Cano (For self and on behalf of all other heirs of Late Shri Naraina Sinai Quirtonim as their duly constituted attorney)

(IBM Registration No. IBM/9250/2012)

MINING LEASE AREA : 70.20 Ha.
(FOREST LAND : 70.20 Ha.)

CATEGORY OF MINE : OPENCAST, CATEGORY "A" – FULLY MECHANISED MINE, PRIVATE, NON-CAPTIVE

REVIEW & UPDATION OF MINING PLAN PERIOD : 2022-23 to 2026-27

PREPARED BY QUALIFIED PERSON

Cano

MRS. ROSHEL FERNANDES (M.Sc. Geology)

NARAINA S. QUIRTONIM MINES ★ MARGAO GOA

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INTRODUCTION

"Zamblidadga Dongor" Iron and Manganese Ore Mine Mining Lease, bearing ML No. 3/FeMn/79, over an area of 70.20 Ha., located at Village Caurem, Taluka Quepem, District South Goa, State of Goa was originally granted to **Shri. Naraina Sinai Quirtonim** for a period of 20 years for both Iron and Manganese Ores. The Mining Lease Deed was executed on 13-12-1979 and duly registered in the Office of the Sub Registrar of Quepem on 03-06-1981 under Registered No. 172 at Book I Vol.3 at pages 77 to 85.

The Original Lessee died on 22.4.1998 and his leasehold rights in respect of the aforesaid mine devolved upon his successors-in-title, viz: (a) his widow and moiety-holder, viz. Mrs. Kala Naraina Kirtani alias Kala Naraina Quirtonim; (b) daughter, viz. Mrs. Priya Prasad Navelkar married to Mr. Prasad P. Navelkar and (c) daughter, viz. Mrs. Pradnya Zoivant Poi Cano alias Smt. Pradnya Zoivant Pai Cano married to Mr. Zoivant M. Poi Cano alias Zoivant M. Pai Cano. The aforesaid succession is duly certified by a Deed of Succession dated 13.7.1998 drawn up before the Sub-Registrar of Salcete Taluka at Margao, Goa on 21.7.1998 and recorded in his Deeds Book No. 1396 at Folio 26 (overleaf) onwards, read with Mrs. Priya's and Pradnya's marriage certificates. Copy of the Deed of Succession and the two Marriage certificates are attached as ***Annexure No. 18***. The successors-in-title are represented herein by Smt. Pradnya Zoivant Poi Cano alias Smt. Pradnya Zoivant Pai Cano, for self and as their duly constituted attorney.

In terms of provision of MCR 1960 (Rule 24 A (1)), the renewal application was filed on 10-12-1998 within the stipulated period and remained under consideration with the State Government.

The lessee filed an application for Mining Plan for a period from 1996-97 to 1998-99 which came to be approved by Indian Bureau of Mines vide letter no. MP/MAN-283/GOA/97-98 dated 16-03-1998. Thereafter, the lessee filed an application for Scheme of Mining Plan for the period 2002-03 to 2006-07, which came to be approved by Indian Bureau of Mines vide letter no. MSH/MAN-76/GOA/2003-04 dated 10-07-2003.

Fernandes
(Rachel Fernandes)
Qualified Person

खनन योजना / खनन योजना की समीक्षा एवं अद्यतन का अनुमोदन किया जाता है।
Mining Plan / Review & Updation of Mining Plan is approved subject to conditions laid down in Letter No. RMP/MECH-65/GOA/2021-22
Dt. 14.03.2022

14.03.22
उप खान नियंत्रक एवं कार्यालय प्रभारी
Deputy Controller of Mines & Officer In-Charge
भारतीय खान ब्यूरो, मडगांव
Indian Bureau Of Mines, Madgaon

Pending the State Government's consideration of the renewal application, the mining lease continued to work till August 2005 under the provisions of Rule 24(A)(6) of MCR-1960. However, no work could be continued thereafter for want of statutory clearances. Consequently, on 02-08-2006 the lessee gave a notice of temporary discontinuance to Indian Bureau of Mines in terms of Rule 24 of MCDR 1988. A copy of the Notice dated 02-08-2006 is attached as *Annexure No. 4*

The lessee also filed an application for modification in the approved Scheme of Mining for a period from 2002-03 to 2006-07, which came to be approved by Indian Bureau of Mines vide letter no. MSH/MAN-76/GOA/2003-04 Vol.I dated 22-06-2007

An application for grant of Environment Clearance was filed by the lessee with the MoEFCC which was pleased to grant a Term of Reference (TOR) on 19-08-2009. However, soon thereafter, i.e. on 24-02-2010, a moratorium was imposed by the Government of India against considering any mining proposals from the State of Goa, till the finalization of State Mineral Policy of Goa. Consequently, the Lessee's application for grant of Environment Clearance was not processed further and remained pending.

The lessee filed successive applications for Scheme of Mining for two successive Mining Plan periods, viz. from 2007-08 to 2011-12 and from 2012-13 to 2016-17. These came to be approved by the Indian Bureau of Mines vide, respectively, vide letter no. MS/SG/GOA/FeMn-46-SZ/815 dated 04-05-2010 and MS/SG/GOA/FeMn-65-SZ dated 05-12-2012.

On 18-07-2014, Rule 24 A(6) came to be inserted in MCR-1960, which provided that if the first renewal application was not disposed before expiry of lease period, period of lease would stand extended by two years or till State Government passes orders on renewal application, whichever is earlier. Thus, the lease period of the mining lease stood extended *till 18-07-2016* by virtue of the deeming provision of Rule 24-A(6).

At this point of time, i.e. on 18-07-2014, the aforesaid Mining Scheme approved by the Indian Bureau of Mines vide letter No. MS/SG/GOA/FeMn-65-SZ dated 05-12-2012 was still current, i.e. till 31-03-2017.

Meanwhile, the MMDR Act 1957 was amended with effect from 12-01-2015, firstly by way of an Ordinance and, later, by the Amendment Act which was passed on 26-03-2015 (however with retrospective effect from 12-01-2015). By the 2015 Amendment, *inter-alia*, Section 8A was

inserted in the MMDR Act, 1957 governing the period of grant of Mining Lease for minerals other than Coal, Lignite and Atomic minerals.

In terms of the newly inserted provisions of Section 8A, Government of India vide letter no. 1.0. No. 1/1/2014-M.VI (Pt.III) dated 08-02-2015, issued directions for giving effect to the provisions of Section 8A by issuing a letter of intimation to the lease holders.

Though the lessee was entitled to the benefit of a 50-year term for its mining lease in terms of Section 8A(3) of MMDR Act 1957, the Government of Goa did not pass the necessary orders for a considerable time granting the 50 years term for the mining lease. Consequently, there was uncertainty whether the mining lease was subsisting / continuing.

In such a situation, after 31-03-2017, i.e. after the tenure of the then current Mining Scheme came to an end. in the absence of any extension order from the Government, it was moot whether filing an application for grant of fresh Scheme, i.e. for the period 2017~2022, would at all be considered. Hence, post 31-03-2017, application for grant of fresh Scheme was not filed in view of the uncertainty whether the mining lease was subsisting / continuing.

Ultimately, the lessee accordingly filed its representation to the Directorate of Mines and Geology, Government of Goa on 08-06-2021 for issuance of the necessary Extension Order granting the 50-year term for the mining lease.

When the aforesaid representation to the Directorate of Mines and Geology, Government of Goa dated 08 06 2021 was under consideration, the lessee undertook survey of the lease boundary pillars using Differential Global Positioning System (DGPS) by "Remote Sensing Instruments", Plot No. 7, Industrial Estate, Kukatpally, Hyderabad - 500072, which is an empaneled agency of Directorate of Mines and Geology, Government of Goa (DMG, Goa) vide Order No. 01/593/10-mines/203, dated 05-04-2013. The DGPS plan which admeasured the lease area of 70.20 Ha. was duly authenticated by the Directorate of Mines and Geology, Goa on 10-12-2021.

Finally, the State Government vide its Order no. 96/51/09-Mines/1840 dated 04-01-2022 passed under Section 8A(3), MMRD Act, 1957, (read with Section 8A(6), MMDR Act, 1957) granted extension of Mining Lease for a period from 13-12-1979 to 12-12-2029, i.e. for a term of 50 years (*"Said 4.1.2022 Extension Order"*). Copy of the Said 04-01-2022 Extension Order is

enclosed as *Annexure No. 1*. The Said 04-01-2022 Extension Order was however received by the lessee on 19-01-2022.

On 25-01-2022, i.e. immediately upon receiving the Said 4.1.2022 Extension Order on 19-01-2022, the lessee filed application for Review & Updation of the Mining Plan for the mining lease under Rule 17 of MCR 2016.

In terms of the Said 04-01-2022 Extension Order, Supplementary Lease Deed was executed on 3rd-02-2022 for the said Mining Lease, for an area of 70.20 Ha. Copy of the Supplementary Lease Deed is enclosed as *Annexure No. 2*.

Though the lessee was entitled to receive a 50-year term extension Order under the provisions of the newly inserted S. 8A, MMDR, 1957, no such orders were forthcoming from the State Government in respect of the said mining lease. Moreover, in view of Rule 24-A(6), MCR-1960, the lease period of the mining lease stood extended only *till 18-07-2016*. It was only pursuant to the lessee's application dated 08-06-2021 that the Said 04-01-2022 Extension Order came to be passed and was received by the lessee on 19-01-2022. Thus, in view of there being complete uncertainty surrounding subsistence/continuation of the mining lease post 18-07-2016 and till the Said 04-01-2022 Extension Order was received from the State Government, application seeking Review & Updation of the Mining Plan after 31-03-2017 was not filed since the lessee would have been questioned as to how the lessee was seeking the Review in the absence of any lease extension order. However, no sooner the lessee received the Said 04-01-2022 Extension Order on 19-01-2022, within less than a week, i.e. on 25-01-2022 the lessee filed for Review & Updation of the Mining Plan with utmost despatch.

The entire lease area consisting of 70.20 Ha. is Forest land. The lessee is in the process of filing application for diversion of Forest area for mining activity. There is an existing approach road from mining lease connecting to the Quepem - Pirla district road. This approach road passes through forest area. Necessary permissions/ NOC will be obtained if matter arises.

Chapter 1 : GENERAL INFORMATION

1.1 : Lease Details

IBM Registration Number:	IBM/9250/2012		
Lease Code:	3/FeMn/79		
Mine Code:	40GOA02002		
Name of Lessee:	Late Shri. Naraina Sinai Quirtonim Represented by Smt Pradnya Zoivant Pai Cano (For self and on behalf of all other heirs of Late. Shri Naraina Sinai Quirtonim as their duly constituted attorney)		
Address of Lessee:	Mathura, H.No. 1153, Near St. Joseph High School, Aquem, Alto, Margao, Goa – 403601		
Type of Lessee :	Individual		
Name of Mining Lease:	Zambldadga Dongor Iron & Manganese Ore Mine		
State:	Goa		
District:	South Goa		
Tehsil/ Taluk/ Mandal:	Quepem		
Village:	Caurem		
Lease Area (Ha):	70.20 Ha.		
Forest Area (Ha):	70.20 Ha.		
Name of Minerals:	Iron Ore		
Name of associated minerals:	Manganese Ore		
Type :	Existing Lease		
Five Year Block (Financial Year)	2022-23	To	2026-27
Type of working:	Opencast		
Nature of Use:	Non Captive		
Category of Mine:	Category A-Mechanized		

1.1.1: Initial/subsequent Lease grant details

Grant	From	To	Lease deed execution date	Lease registration date
Initial grant	13-12-1979	12-12-1999	13-12-1979	03-05-1981
Extension	13-12-1999	12-12-2020	16-02-2022	In Process

1.1.2: Mining Plan Submission Criteria Details

Type of document	Review & Updation of Mining Plan
Reason/s for modification	Nil
Period for which modification is proposed	Nil
LOI Number:	Not Applicable
Date:	Nil

1.2: Land Ownership Details

S. No.	Village	Taluka	Area (Ha.)	Khasra No/ Compartment No.	Type of Land
1	Cavrem	Quepem	70.20	19/0 (P)	Forest Land

1.3: Existing Lease

Date of Execution :

The Mining Lease was executed on 13-12-1979 and the same was duly registered on 03-06-1980 in the Office of the Sub Registrar of Quepem, Goa, under Registered No 172 at Book I Vol.3 at pages 77 to 85. Subsequently vide Order no 90/ST/99-Mines/1840 dated 04-01-2022 issued by Directorate of Mines and Geology, Government of Goa, the Mining Lease has now been granted upto 12-12-2029. A copy of the said Order is attached as **Annexure No. 1**

1.3.1: Approval of earlier Mining Plan & Its Subsequent Review in Chronological Order -

Sl. No.	Letter no.	Date	Period		Type Of Approved Document
			From	To	
1	MP/MAN-283/GOA/97-98	16-03-1998	1996-97	1998-99	Mining Plan
2	MSH/MAN-76/GOA/2003-04	10-07-2003	2002-03	2006-07	Scheme of Mining
3	MSH/MAN-76/GOA/2003-04 Vol I	22-06-2007	2002-03	2006-07	Modification in Approved Scheme of Mining
4	MS/SG/GOA/FeMn-46-SZ/815	04-05-2010	2007-08	2011-12	Scheme of Mining
5	MS/SG/GOA/FeMn-63-SZ	05-12-2012	2012-13	2016-17	Scheme of Mining

Copy of the Approval letters of The Mining plan, Scheme of Mining & Modification in Approved Scheme of Mining are enclosed as Annexure No. 3

1.3.2: Partial Surrendered Area during Stages of Operations in Chronological Order – Nil

Sl. No.	Date	Supplementary Surrender under Letter Number	Supplementary Lease Deed Date	Final Retained Area over which current Mining Plan is Prepared (ha)
Nil	Nil	Nil	Nil	Nil

1.3.3: Transfer of Lease Area Subsequent to Grant – Nil

Sl. No.	Transfer of lease deed Number	Date of execution of Transfer lease deed	Name of Transferor	Nature of block transferred	
				Granted through auction	other than through auction for captive use
Nil	Nil	Nil	Nil	Nil	Nil

1.3.4: Statutory Compliances

The lessee applied for the grant of Environmental Clearance (EC), pursuant to which, on 19-08-2009, MoEF issued Terms of reference (TOR) for undertaking a detailed Environmental Impact Assessment (EIA) study. However, within six months or so, i.e. on 24-02-2010, the Government of India issued a moratorium against consideration of any mining proposals for EC till the Mineral Policy for the State of Goa was finalized. The 24-02-2010 moratorium also further directed that the proposals which were then presently in the pipeline for grant of EC or for granting TOR, be returned to the project proponents.

Consequently, on account of the 24.02.2010 moratorium, further processing of the application for grant of EC for the mine did not proceed further and consequently, EC could not be processed further.

As pointed out earlier, on 19-01-2022, on the lessee's application/representation dated 08-06-2021, the said 04-01-2022 Extension Order was passed granting 50-year term in respect of the said mine. Pursuant to the said 04-01-2022 Extension Order, the lessee is in the process of applying for EC.

Similarly, as regards to Forest Clearance the lessee is in process of filing application for diversion of Forest area for mining activity. Consent to operate from Goa State Pollution Control Board (GSPCB) shall be obtained after the grant of Environmental Clearance.

1.3.4.1: Environment Clearance – In process

Applicable	Yes
Letter No	In process
Date	--
Validity	--
ROM Mineral in tonnes	0.5 MTPA (For Iron Ore)

1.3.4.2: SPCB Approvals – Will be applied once Environmental Clearance is obtained.

Letter No	--
Approval of	--
Date	--
Validity	--
ROM Mineral in tonnes	--

1.3.4.3: Forest Clearance – In process

Applicable	Yes
Letter No	In process
Date	--
Validity	--
Area (Ha)	70.20 Ha

1.3.4.4: Land Acquisition Details -

Total Area acquired/purchased so far	Nil
Total Amount Paid (INR)	Not Applicable

1.3.5: Mine Location Details –

Topo sheet Number:	48 I/4

There is an existing approach road from mining lease connecting to the Quepem – Pirla district road. This approach road passes through forest area. Necessary permissions/ NOC will be obtained if matter arises

1.3.5.1: Location of Boundary Pillars – (add additional Row for subsequent pillars)

The lease boundary pillars were surveyed using Differential Global Positioning System (DGPS) by "Remote Sensing Instruments", Plot No. 7, Industrial Estate, Kukatpally, Hyderabad - 500072, which is an empaneled agency of Directorate of Mines and Geology, Government of Goa (DMG, Goa) vide Order No. 01/593/10-mines/203, dated 05-04-2013. The DGPS plan admeasuring a lease area of 70.20 Ha. is duly authenticated by the Directorate of Mines and Geology, Goa on 10-12-2021. A Copy of the DGPS Plan is enclosed as **Plate No.10**

The lease boundary pillar co-ordinates are given below:

Pillar No.	Pillar Latitude (dd:mm:ss.ss)	Pillar Longitude (dd:mm:ss.ss)
BP-1	15° 08' 9.378"	74° 04' 30.733"
BP-2	15° 08' 12.495"	74° 04' 22.778"
BP-3	15° 08' 14.725"	74° 04' 15.586"
BP-4	15° 08' 09.792"	74° 03' 53.092"
BP-5	15° 07' 45.289"	74° 03' 56.971"
BP-6	15° 07' 51.409"	74° 04' 14.197"
BP-7	15° 07' 53.039"	74° 04' 28.142"
BP-8	15° 08' 04.228"	74° 04' 37.503"
BP-9	15° 08' 01.452"	74° 04' 21.392"
BP-10	15° 08' 06.856"	74° 04' 22.182"

Datum : WGS 84

1.3.6: Owner/Nominated Owner Details –

Name	PAN of Nominated Owner	Address of Nominated Owner	Mobile Number	Email	Please attach Minutes of Board Resolution in case of Nominated Owner
Pradnya Anand Pai Cano	ASYPP2866P	H.No. 600, Bhawani Sadan, Colmerud Navelim, Salcette, Goa. PinCode: 403707	9822210465	zmbdmine@gmail.com	Copy of General Power of Attorney is attached as Annexure No. 5

Copy of ID proof and Address proof of the Nominated Owner is enclosed as Annexure No. 6.

1.3.7: Qualified Person Details as per M(OAHCEM)CR, 2016

Sr. No.	Prefix	Name	PAN of QP	Address	Mobile no.	Qualification	Experience in years as prescribed under the rule	Email
1	Mrs.	Roshel Fernandes	AATPF1004A	H.No. 323/9S, Opp. Shetye Salkar Residency, Fatorda, Margao Goa. 403602	9049930828	M.Sc. Geology	15 Years	roshel.fernandes05@gmail.com

Experience and Qualification certificate of Qualified Persons is enclosed as Annexure No. 7

Chapter 2 : GEOLOGY & EXPLORATION

2.1: Geology

2.1.1: Topography –

Terrain	Undulating

Relief

Highest Level (m) from MSL	Lowest Level (m) from MSL	Average Level (m) from MSL
310	150	230

Drainage Pattern	Order of Stream	Minimum Distance of Stream from Lease Area (m)
Dendritic	1	Within lease

2.1.2: Details of Physiographic features and Infrastructures available in and around the lease/ block area –

Description	Location if existing Within the lease/block area.	Distance from boundary periphery in kms, if existing outside the lease/block area. (within 5.00Kms)	Remark if any
River/Nallah/Reservoir	Nil	2.0	Karka Nalla
Public roads (Tar road, cart road)	Nil	0.5	Quepem-Pirla Village road
Railway track	Nil	3.5	Bali Railway Tracks
Human settlements	Nil	0.25	Village Caurem
Archaeological monuments/ places of worships/public utilities etc.	Nil	0.37	Mallikarjun Temple
		2.0	Government Higher secondary School, Maina
		0.68	Panchayat & Health Centre, Caurem
Wild life sanctuaries/ national parks	Nil	Nil	
Coastal Regulation Zone (CRZ)	Nil	Nil	
Power transmission lines/telephone lines	Nil	0.25	In Village Caurem
Firing range	Nil	Nil	
Ordinance factory	Nil	Nil	
grazing land/ burial ground or cremation ground	Nil	1.5	In Village Caurem
Any other specify	Nil	Nil	

Particulars	Distance from lease boundary in kms
Nearby village	0.68 km - Caurem Village
Nearest Railway station	4.98 km - Sali Railway Station
Nearest Port	40 km - Marmugao Port
Distance of SH/ NH from lease area	3.4 km - NH66

2.1.3: Regional Geology –

The Iron ore formations of Goa belong to Dharwar super group which consists of Vageri Formation, Bicholim Formation, Sanvordem Formation & Barcem Formation. All the formations are very important and from commercial point of view, it contains all the iron and manganese ore deposits of Goa, which is the backbone of Goa's economy. Bicholim formation overlies Sanvordem Formation conformably and it includes quartz chlorite, amphibolite schist, ferruginous pink phyllite, limestone and manganiferrous chert breccia with pink ferruginous phyllite and banded ferruginous quartzite's.

The formation extends NW-SE direction. Broadly the northern portion of the formation lying to the north of Usgao is rich in iron ore deposits, the southern portion of the deposits south of Sanvordem is rich in Manganese deposits and the central portion has both manganese and Iron ore deposits of medium grade and relatively smaller in size.

2.1.4: Local Geology & Structure -

Entire area is covered with thick cap of laterite. However, the normal succession of litho units as observed from the surface studies and the exploration data is

- Laterite
- Iron ore
- Phyllitic/ Manganiferrous Clays.

The entire area is more or less virgin, but for three old working pits. Based on the exposed rocks formation and the available borehole data, reveal that the ore body and the associated rocks are folded. The ore formation in general are associated with the ferruginous phyllite and limonite clays on the hanging wall side and phyllitic & Manganiferous clays formation towards the footwall side. The geological formation as revealed from the field studies and exploration data is as follows:

- General strike = NW - SE with local variation of 80 to 85 degrees
- Dip = The ore body is folded with dip towards NE and SW direction and having an angle of dip varying from 15° to 50°.

- Depth = Depth varies from 10 to 42 meters
- Type of ore – Lumpy at surface and tends to be powdery ore at depth

2.1.4.2: Structure –

Structurally ore body and associated formations appears to be subjected to synclinal folding with dips towards NE & SW.

The lease area is hilly in terrain with a major mineral band having a strike of NW-SE. The highest and lowest elevations in the lease area are 310m MSL and 130m MSL respectively. General strike of the Ore body is N80° -85°W to S80° -85°E and the dip direction varies from 15° to 50° towards NE and SW. No major structural disturbances have been observed within the lease area.

Also towards the northern side of the lease area there is the Manganese pit while towards the South eastern is the Iron ore pit where the litho units are exposed

2.1.4.3: **Lithology, Petrographic & Mineralogical Description for Major, Associated & Indicator Minerals** –

Generally, the litho units as observed from the surface studies and the exploration data are the top capping of Laterite, followed by Iron ore, Manganese ore & Phyllitic clays.

The laterite is basically brownish pink to pinkish in colour, hard to medium in nature with concentration of Alumina. At places it is concentrated with Iron ore and also Manganese ore. Laterite analyses about 30-35% Fe with 15-20% Al_2O_3 and 20-25% SiO_2.

The Phyllites are pale pinkish and soft in nature with fine to medium grain size. They phyllites are having about 25-30% Fe with 18-22% Al_2O_3 and 15-20% SiO_2.

The Iron ore of this area is grayish blue in colour and is fine to medium grained size. The main mineral is haematite followed by limonite and goethite. The Iron ore generally analyses about 55-60% Fe with 3.5-6% Al_2O_3 and 1.5-3.5% SiO_2

Manganese ore is also seen as an associated mineral in the lease area. The manganese ore is purple to bluish in colour, is at places hard in nature and having fine to medium grain size. The Manganese ore is having more than 25% Mn with 5-6% Al_2O_3 and 10-12% SiO_2

2.1.4.4: Mode of Occurrence & Controls of Mineralization -

Iron Ore in Goa was formed from Banded Hematite Quartzite's and Ferruginous Phyllites through a specific process of leaching away silica, replacement by iron & concentration of iron. The process involves the circulating waters leaching away the Ca, Mg and Al in the initial stage followed by leaching of the silica in the later stage from banded hematite quartzite's resulting in the concentration of iron ore.

2.1.4.5: Extent of Weathering/ Alteration -

The possible two stages in the process of iron ore formation are:

1. Rocks of iron ore series have been variously metamorphosed, repeatedly folded and considerably altered by weathering and action of circulating waters and solutions of magmatic/meteoric origin in the zone of oxidation. Seriously changes brought about by circulating waters resulting in leaching away of Ca, Mg and Al oxides from ferruginous phyllites with consequent concentration of iron and silica giving rise to banded hematite quartzite's
2. Further action of circulating water was responsible for leaching away of silica from banded hematite quartzite's, replacement and concentration of iron.

Laterization has played an important role in the concentration of manganese and iron in the lease area, giving rise to rich accumulation of manganese and iron ore. The exploratory drilling in this lease area reveals iron ore body at a depth varying from 10m to 42m with laterite lumpy iron ore at a depth of 2.0 to 15m from the surface.

2.1.4.6: Nature/Form of Mineral - Iron Ore: Lumpy & Powdery Ore
Manganese Ore: Lumpy Ore

2.1.4.7: Extent of Mineralization -

Entire area is covered with thick cap of laterite. The different litho units presents in the area are Laterite Iron ore, Manganese Ore, Phyllitic/ Manganiferrous Clays. No major structural disturbances have been observed within the lease area.

There is one band of iron ore within the lease area having a strike length of about 1000m, width of about 150m and an average depth of 31.8m. The general strike of the Ore body is N80°-85°W to S80°-85°E and the dip direction varies from 15° to 50° towards NE and SW. The iron ore body is lumpy at surface and tends to be powdery ore at depth and the depth varies from 10m to 42m.

There are pockets of Manganese deposits towards the northern part of the lease area having a length of about 250m, width of about 100m and an average depth of 10m. The Manganese ore is lumpy in nature.

2.1.4.8: Deposit Type (as per MEMC Rule) -

Type: Bedded, Stratiform and Tabular deposit of regular habit

Strike / Trend of the Ore Body: N80°–85°W to S80°–85°E

Amount of dip of Ore body: 75° to 50°

Dip Direction of the Ore Body: NE and SW

Plunge of Mineral Body (degree) (if any): NA

Direction of plunge: Not Applicable

2.2: Exploration -

2.2.1: Summary of The Previous Exploration (for fresh grant) / During Last Plan Period (For existing leases) -

Name of the Agency – Shri. Naraina Sinai Quirtonum

2.2.1.1: Geological Mapping -

Sl. No.	Year	Scale	Area Covered (Hect/km²)
1	2021-22	1 : 2000	70.20 Ha.

2.2.1.2: Airborne Geophysical Survey - Nil

Sl. No.	Type of Survey	Spacing (m)	Total line (km)	Area Covered (Ha/km²)	Latitude		Longitude	
					To	From	To	From
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

2.2.1.4: Geochemical Survey - Nil

Sl. No.	Type of Sample	No of Samples	Analysis report	Area Covered (Ha/km²)
Nil	Nil	Nil	Nil	Nil

2.2.1.5: Pitting – Nil

No. of pits:

Sl. No.	Year	Pit ID	Length of Pit (m)	Width of Pit (m)	Depth of Pit (m)	Depth (from)	Depth (to)	Running meters	Litho units exposed	Name of the radical	Av. Grade (in %)	Latitude	Longitude
	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

2.2.1.6: Trenching – Nil

No. of trenches: Nil

2.2.1.6.1: Spacing

Min (m)	Max (m)	Avg (m)
Nil	Nil	Nil

Sl. No.	Year	Trench ID	Length of Trench (m)	Width of Trench (m)	Depth of Trench (m)	Depth(from)	Depth(to)	Running meters	Litho units exposed	Name of the radical	Av grade	Latitude (from)	Longitude (from)	Latitude (to)	Longitude (to)
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

2.2.1.7 Exploratory Drilling (Core/non-Core) – Nil

Sl. No.	Year	Exploration agency	Core holes		Non-core (RC/DTH)		Grand total		Attach log sheet of each borehole in csv/excel format.
			Number of boreholes drilled	Total meter	Number of boreholes drilled	Total metres	Total boreholes	Total meters	
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

2.2.1.8: Exploratory Mining – Nil

Sl. No.	Pit/Adit ID	Length in Mtr	Width in Mtr	Depth in mtrs	Volume (m³)
Nil	Nil	Nil	Nil	Nil	Nil

2.2.1.9: Sampling – Nil

Sl. No	Type of sample	No of samples collected	Number of samples analyzed	Location		Remark if any
				Latitude	Longitude	
Nil	Nil	Nil	Nil	Nil	Nil	Nil

2.2.1.10: Chemical Analysis -

S.No.	Sample ID	Minerals	Fe%	Al_2O_3%	SiO_2%	Mn%
1	S-1	Iron Ore	54.1	12.38	1.45	--
2	S-2	Laterite	44.5	17.87	4.70	--
3	S-3	Lateritic Lumpy Iron Ore	52.5	11.84	3.65	--
4	S-4	Iron Ore	53.2	11.75	1.85	--
5	S-5	Lateritic Lumpy Iron Ore	48.9	16.68	3.95	--
6	S-6	Lateritic Lumpy Iron Ore	48.6	16.0	3.85	--
7	S-7	Lateritic Lumpy Iron Ore	53.8	12.9	1.6	--
8	S-8	Lateritic Lumpy Iron Ore	49.8	14.08	3.85	--
9	S-9	Lateritic Lumpy Iron Ore	50.9	12.09	3.18	--
10	S-10	Lateritic Lumpy Iron Ore	51.8	12.05	2.85	--
11	S-11	Lateritic Lumpy Iron Ore	52.8	11.86	2.45	--
12	S-12	Lateritic Lumpy Iron Ore	52.9	11.45	2.18	--
13	S-13	Lateritic Lumpy Iron Ore	46.0	16.75	4.66	--
14	S-14	Lateritic Lumpy Iron Ore	52.0	11.61	2.88	--
15	S-15	Lateritic Lumpy Iron Ore	50.9	12.58	2.98	--
16	S-16	Lateritic Lumpy Iron Ore	49.7	16.45	3.85	--
17	S-17	Lateritic Lumpy Iron Ore	47.8	16.57	3.95	--
18	S-18	Lateritic Lumpy Iron Ore	51.0	12.61	3.68	--
19	S-19	Lateritic Lumpy Iron Ore	49.9	15.56	4.32	--
20	S-20	Lateritic Lumpy Iron Ore	52.3	11.03	2.78	--
21	S-21	Lateritic Lumpy Iron Ore	48.4	16.42	3.65	--
22	S-22	Lateritic Lumpy Iron Ore	51.0	11.90	3.32	--
23	S-23	Lateritic Lumpy Iron Ore	50.8	12.77	3.55	--
24	M-1	Manganese Ore	18.3	9.40	5.70	30.50
25	M-2	Manganese Ore	16.7	11.42	5.66	28.75

Chemical analysis certificate of samples is attached as **Annexure No. 9**

Also 10% of the samples were analyzed from NABL accredited laboratory and the results of the same are enclosed as **Annexure No. 10.**

2.2.1.11: Petrology & Mineratogical Studies - Nil

Sl. No.	Type of Sample	Number of Sample Drawn	Number of Sample Analyzed	Petrographic Study Report
Nil	Nil	Nil	Nil	Nil

2.2.1.12: Beneficiation Studies – Nil

Sl. No.	Type of Beneficiation	Number of Samples	Attach
Nil	Nil	Nil	Nil

2.2.1.13: Bulk Density Study as per M (EMC) Rules, 2016 and SOP of CGPB –
Method adopted for calculating bulk density of ore and waste

The bulk density study for Iron ore, Lateritic Lumpy Iron Ore and Waste from the mine have been determined and copy of the report of Bulk density study carried out is enclosed as Annexure no. 12. The Bulk density for Manganese ore has been assumed based on the earlier approved Scheme of Mining dated 05-12-2012. Details of the Bulk density are given as follows:

Sl. No.	Nature of Ore/OB	Mineral	Number of samples	Bulk Density Established (t/m³)
1	Iron Ore	Iron Ore	3	2.8
2	Lateritic Lumpy Iron Ore	Iron Ore	3	2.5
3	Waste	Clays	3	2.0
4	Manganese Ore	Manganese Ore	Nil	2.6

2.2.1.14: Area Covered under Exploration

Level of exploration	Area in Ha		Total area in Ha.
	Forest	Non-forest	
G-1	1.6458	0	1.6458
G-2	7.4793	0	7.4793
G-3	20.6331	0	20.6331
G-4	0	0	0
Area proved as Non-mineralized	40.4418	0	40.4418
Area to be explored	0	0	0
Total	70.20	0	70.20

The detailed surface geological and structural mapping of the entire mining lease area along with the surface and geological mapping of old pits where the litho-units are exposed have been carried out.

Sampling of the mineralized area was also undertaken. The non-mineralized area is mostly located at inaccessible hill slopes which are covered with laterite having murrum. Based on the exposures in the open pits and the analysis results, the mineralized zone has been demarcated.

Few non-core boreholes along with the trenches is proposed over the non-mineralized area and depending on the results of the proposed exploration further exploration will be carried out to establish the Mineral resource. The proposed exploration is shown on Geological plan **Plate no. 3**.

2.2.2: Summary of the Previous Exploration (Before Last Plan Period)

Name of Agency: Shri. Narsina Sinai Quirtonim

2.2.2.1: Geological Mapping -

Sl. No.	Year	Scale	Area Covered (ha)
1.	10-04-2012	1 : 2000	70.20

2.2.2.2: Airborne Geophysical Survey - Nil

Sl. No.	Type of Survey	Spacing (m)	Total line (km)	Area Covered (ha)	Latitude	Longitude
Nil	Nil	Nil	Nil	Nil	Nil	Nil

2.2.2.3: Ground Geophysical Survey - Nil

Sl. No.	Type of Survey	Spacing (m)	Total line (km)	Area Covered (ha)	Latitude	Longitude
Nil	Nil	Nil	Nil	Nil	Nil	Nil

2.2.2.4: Geochemical Survey - Nil

Sl. No.	Type of Sample	No of Samples
Nil	Nil	Nil

2.2.2.5: Pitting - Nil

Sl. No.	Pit ID	Length of Pit (m)	Width of Pit (m)	Depth of Pit (m)	Litho Unit Exposed	Litho Unit From (m)	Litho Unit To (m)	Average Grade	Running Meters (m)	Latitude	Longitude
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

2.2.2.6: Trenching -Nil

Number of Trenches	SPACING		
	Min (m)	Max (m)	Avg (m)
Nil	Nil	Nil	Nil

Area Covered Under Trenching - Nil

Co-ordinates -Nil

Latitude	Longitude
Nil	Nil

Sl. No.	Trench ID	Length of Trench (m)	Width of Trench (m)	Depth of Trench (m)	Litho Unit Exposed	Average Grade (%)	Running Meters (m)	From Longitude	From Latitude	To Latitude	To Longitude
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

2.2.2.7: Exploratory Drilling

2.2.2.7.1:Core/Non-core Drilling - Non-Core Drilling

			Core holes		Non-core (RC/DTH)		Grand total		
Sl. No	Year	Exploration agency	Number of boreholes drilled	Total meter (m)	Number of boreholes drilled	Total meter (m)	Total boreholes	Total meter (m)	Attach logsheet of each borehole in csv/ excel format
1	2005	Shri. Narains Sinai Quadros	Nil	Nil	14	431	14	431	Borehole Logsheets in pdf format are enclosed as Annexure No. 8

2.2.2.8: Exploratory Mining -

Details of exploratory mining carried out in manganese pit is given below:

Sl. No.	Pit ID	Volume (m³)
1	2	210m x 85m x 7m
2	3	110m x 100m x 8m

2.2.2.9. Sampling –

Sl. No.	Type of Sample	Number of Samples	Area Covered (ha)	Latitude	Longitude
1	Borehole sample (KR-01)	11	-	15° 07' 57.3194"	74° 04' 25.7670"
2	Borehole sample (KR-02)	16	-	15° 07' 56.5167"	74° 04' 26.0447"
3	Borehole sample (KR-04)	20	-	15° 07' 54.6145"	74° 04' 25.6229"
4	Borehole sample (KR-07)	4	-	15° 07' 57.3382"	74° 04' 26.9677"
5	Borehole sample (KR-08)	5	-	15° 07' 58.4792"	74° 04' 27.4577"
6	Borehole sample (KR-10)	6	-	15° 07' 57.5476"	74° 04' 04.3573"
7	Borehole sample (KR-14)	3	-	15° 07' 59.9820"	74° 04' 28.4197"
8	Borehole sample (KR-15)	3	-	15° 07' 59.3757"	74° 04' 27.1814"

2.2.2.10: Chemical Analysis

S.No.	Sample ID	Minerals	Radical Analysis Fe%	Radical Analysis SiO_2%	Radical Analysis Al_2O_3%
1	KR-01 (1-2)	Iron Ore (Lumpy)	58.2	Nil	Nil
2	KR-01 (2-3)	Iron Ore (Lumpy)	51.9	Nil	Nil
3	KR-01 (3-4)	Iron Ore (Lumpy)	56.5	Nil	Nil
4	KR-01 (4-5)	Iron Ore (Powdery)	60.2	Nil	Nil
5	KR-01 (5-6)	Iron Ore (Powdery)	63.3	Nil	Nil
6	KR-01 (6-7)	Iron Ore (Powdery)	61.5	Nil	Nil
7	KR-01 (7-8)	Iron Ore (Powdery)	54.9	Nil	Nil
8	KR-01 (8-9)	Clay	41.3	Nil	Nil
9	KR-01 (9-10)	Iron Ore (Powdery)	59.9	Nil	Nil
10	KR-01 (10-11)	Iron Ore (Powdery)	55.7	Nil	Nil
11	KR-01 (11-12)	Clay	47.2	Nil	Nil
12	KR-02 (10-11)	Iron Ore (Powdery)	55.7	Nil	Nil
13	KR-02 (11-12)	Iron Ore (Powdery)	60.3	Nil	Nil
14	KR-02 (12-13)	Iron Ore (Powdery)	58.7	Nil	Nil
15	KR-02 (13-14)	Iron Ore (Powdery)	65.5	Nil	Nil
16	KR-02 (14-15)	Iron Ore (Powdery)	59.3	Nil	Nil
17	KR-02 (15-16)	Iron Ore (Powdery)	58.9	Nil	Nil
18	KR-02 (16-17)	Iron Ore (Powdery)	63.6	Nil	Nil
19	KR-02 (17-18)	Iron Ore (Powdery)	61.3	Nil	Nil
20	KR-02 (18-19)	Iron Ore (Powdery)	61.8	Nil	Nil
21	KR-02 (19-20)	Iron Ore (Powdery)	66.9	Nil	Nil
22	KR-02 (20-21)	Iron Ore (Powdery)	67.5	Nil	Nil
23	KR-02 (21-22)	Iron Ore (Powdery)	63.7	Nil	Nil
24	KR-02 (22-23)	Iron Ore (Powdery)	66.2	Nil	Nil
25	KR-02 (23-24)	Iron Ore (Powdery)	53.3	Nil	Nil
26	KR-02 (24-25)	Iron Ore (Powdery)	63.0	Nil	Nil
27	KR-02 (25-26)	Iron Ore (Powdery)	59.0	Nil	Nil
28	KR-04 (5-6)	Iron Ore (Powdery)	54.8	Nil	Nil
29	KR-04 (6-7)	Iron Ore (Powdery)	57.3	Nil	Nil
30	KR-04 (7-8)	Iron Ore (Powdery)	54.7	Nil	Nil
31	KR-04(8-9)	Iron Ore (Powdery)	53.7	Nil	Nil
32	KR-04 (9-10)	Iron Ore (Powdery)	54.7	Nil	Nil
33	KR-04 (10-11)	Iron Ore (Powdery)	51.3	Nil	Nil
34	KR-04 (11-12)	Iron Ore (Powdery)	49.3	Nil	Nil
35	KR-04 (12-13)	Iron Ore (Powdery)	43.7	Nil	Nil

36	KR-04 (13-14)	Iron Ore (Powdery)	49.7	Nil	Nil
37	KR-04 (14-15)	Iron Ore (Powdery)	47.5	Nil	Nil
38	KR-04 (15-16)	Iron Ore (Powdery)	57.3	Nil	Nil
39	KR-04 (16-17)	Iron Ore (Powdery)	62.0	Nil	Nil
40	KR-04 (17-18)	Iron Ore (Powdery)	62.3	Nil	Nil
41	KR-04 (18-19)	Iron Ore (Powdery)	60.5	Nil	Nil
42	KR-04 (19-20)	Iron Ore (Powdery)	60.5	Nil	Nil
43	KR-04 (20-21)	Iron Ore (Powdery)	63.6	Nil	Nil
44	KR-04 (21-22)	Iron Ore (Powdery)	58.7	Nil	Nil
45	KR-04 (22-23)	Iron Ore (Powdery)	60.5	Nil	Nil
46	KR-04 (23-24)	Iron Ore (Powdery)	56.5	Nil	Nil
47	KR-04 (24-25)	Iron Ore (Powdery)	57.8	Nil	Nil
48	KR-07 (15-19)	Iron Ore (Powdery)	55.4	2.5	13.8
49	KR-07 (19-23)	Iron Ore (Powdery)	58.6	2.9	9.2
50	KR-07 (23-26)	Iron Ore (Powdery)	61.5	2.5	5.7
51	KR-07 (26-32)	Iron Ore (Powdery)	60.0	1.7	6.9
52	KR-08 (11-14)	Laterite	48.6	Nil	Nil
53	KR-08 (14-17)	Iron Ore (Powdery)	52.3	Nil	Nil
54	KR-08 (17-19)	Iron Ore (Powdery)	58.3	Nil	Nil
55	KR-08 (19-22)	Iron Ore (Powdery)	58.1	Nil	Nil
56	KR-08 (22-26)	Iron Ore (Powdery)	55.0	Nil	Nil
57	KR-10 (18-20)	Iron Ore (Powdery)	52.5	Nil	Nil
58	KR-10 (20-22)	Iron Ore (Powdery)	57.6	Nil	Nil
59	KR-10 (22-27)	Iron Ore (Powdery)	62.4	Nil	Nil
60	KR-10 (27-30)	Iron Ore (Powdery)	60.9	Nil	Nil
61	KR-10 (30-32)	Iron Ore (Powdery)	62.9	Nil	Nil
62	KR-10 (32-35)	Iron Ore (Powdery)	59.0	Nil	Nil
63	KR-13 (15-21)	Iron Ore (Powdery)	56.3	Nil	Nil
64	KR-13 (21-27)	Iron Ore (Powdery)	59.2	Nil	Nil
65	KR-13 (27-30)	Iron Ore (Powdery)	58.7	Nil	Nil
66	KR-15 (17-22)	Iron Ore (Powdery)	55.2	Nil	Nil
67	KR-15 (24-26)	Iron Ore (Powdery)	56.6	Nil	Nil
68	KR-15 (26-31)	Iron Ore (Powdery)	60.7	Nil	Nil

2.2.2.11: Petrology & Mineralogical Studies – Nil

Sl. No.	Type of Sample	Number of Sample Drawn	Number of Sample Analyzed	Petrographic Study Report
Nil	Nil	Nil	Nil	Nil

2.2.2.12: Beneficiation Test - Nil

Sl. No.	Type of Beneficiation	Number of Samples
Nil	Nil	Nil

2.2.2.13: Bulk Density - Nil

Sl. No.	Rock Types	Number of Samples	Minerals	Bulk Density Established (t/m³)
Nil	Nil	Nil	Nil	Nil

2.2.2.14: Area Covered under Exploration –

G-1 (Ha)	1.6458
G-2 (Ha)	7.4793
G3 (Ha)	20.6331
G-4 (Ha)	0
G1+G2+G3+G4 (Ha)	29.7582

Year	Area converted to G1 from G2, G3 & G4	% increase in G-1 Area	Remaining Area % in G2	Remaining Area % in G3	Remaining Area % in G4	Remaining Area in G2	Remaining Area in G3	Remaining Area in G4
2005	1.6458 Ha.	6%	25%	69%	0%	7.4793 Ha.	20.6331 Ha.	0

Potentially Mineralized area (Ha) 29.7582

2.2.3: Ore Body Geometry & Grade

Sl. No.	Name of the ore band	General Strike / Trend	Dip Of Mineral Body	Average Strike Length (m)	Average Width (m)	Average Depth (m)	Chemical parameters			
							Name of the radical	Min Grade (%)	Max Grade (%)	Avg. Grade (%)
1	Iron Ore	N80°-85°W to S80°-85°E	NE to SW	1000	150	30.8	Fe	45.9	66.7	58.3

2.2.4: Reserve / Resource Estimation Method –

2.2.4.1: Methodology

Resource / Reserve Estimation Method	Sectional Area Method

Methodology

The Reserve & Resources for Iron ore estimated as per last approved Scheme of Mining dated 05-12-2012 is as follows.

Category	UNFC Code	Quantity (Tonnes)
Probable Ore	122	1214000
Preteasibility Mineral Resource	222	1422000
Inferred Mineral Resource	333	336000
TOTAL		2972000

The detailed surface geological and structural mapping at the mining lease area along with the surface and geological mapping of old pits where the litho-units are exposed have been carried out. In the earlier approved Scheme of Mining dated 05-12-2012, though the Lateritic Lumpy Iron Ore was shown on the geological plan, the same was not analyzed and not considered for Reserves and Resource calculation. Samples of the exposed Lateritic Lumpy Iron ore as well as waste have been collected for confirmation of quality of the ore body, thus resulting in an upgradation of the total mineral Reserves and Resource of Iron ore.

Also, as per the guidelines of Minerals (Evidence of Mineral Contents) Rules 2015, the lateral extension of the ore body for Resource assessment is considered not more than 50% of the grid spacing of the probe points.

Hence, based on the above mentioned parameters, the entire Reserves and Resources of Iron Ore have been re-estimated

The Reserve & Resources for Manganese ore estimated as per last approved Scheme of Mining dated 05-12-2012 are about 32020 tonnes and based on the Minerals (Evidence of Mineral Contents) Rules 2015 guidelines, the resources are now restricted to 333 UNFC category.

The potential area along with the entire mineralized area is proposed to be taken up for further exploration and based on the results, the Reserve and Resources will be timely updated.

Reserves and Resources are re-estimated by cross sectional method. Cross sections are drawn at regular interval of 50m and the geological structures are projected based on the boreholes drilled and geological surface exposures. Sectional areas are calculated for each section. These sectional areas are used to calculate section-wise tonnages. Tonnages of the Reserves/ Resources are estimated as a product of sectional areas, sectional influence, bulk density and recovery factor as follows:

Tonnage = Sectional area (m^2) x Section influence (m) x Bulk density (tonnes/ m^3) x Recovery%

The Bulk density for Iron ore, Lateritic Lumpy Iron Ore & waste and Recovery of Iron ore have been determined from laboratory and reports of the same are enclosed as Annexure no. 12 and Annexure no. 13 respectively.

Bulk Density:

Bulk density and recovery is based on time series data. In case of bulk density, the areas were selected based on different types of lithologies and material is excavated using excavator. The excavated material is then weighed and the area is surveyed to know the volume of excavation.

In second method, the Areas were selected based on different types of lithologies and pits of 1m x 1m x 1m dimension were dug. The excavated material is then weighed and the area is surveyed to know the volume of excavation. The bulk density was arrived at by using the following formula.

$$\text{Bulk density} = \frac{\text{Mass (in tonnes)}}{\text{Volume (in m3)}}$$

In-situ Bulk Density test for different grades of Iron Ore (Powdery Ore and Lateritic Lumpy Ore) and different types of waste were conducted. The results of the in situ bulk density for Iron Ore and Lateritic Lumpy Iron Ore is 2.8 tonnes/m^3 and 2.5 tonnes/m^3 respectively. While for the waste (Laterite & Clays) varies from 1.8 tonnes/m^3 to 2.1 tonnes/m^3. Therefore, an in-situ average bulk density of 2.0 tonnes/ m^3 is considered for waste.

2.2.4.2. RESOURCE CALCULATION – Iron Ore (+45% Fe)

Sl. No.	Cross section/ Block	Sectional Area (m^2)	Influence (m)	Depth in mtr	Volume (m^3)	Bulk Density (t/m^3)	Resource Quantity (t)	Level of Exploration	Type of Land	Name of the radical	Grade (%)	Method used for resource estimation
1	S-13	2020	50	-	101000	2.8	282800	G1	Forest	Fe	+45% Fe	Sectional Method
2	S-14	1170	50	-	58500	2.8	163800	G1	Forest	Fe	+45% Fe	Sectional Method
3	S-15	1089	50	-	54450	2.8	152460	G1	Forest	Fe	+45% Fe	Sectional Method
4	S-16	790	50	-	39500	2.8	110600	G1	Forest	Fe	+45% Fe	Sectional Method
TOTAL							709660					
4	S-1	1034	35	-	36190	2.8	101332	G2	Forest	Fe	+45% Fe	Sectional Method
5	S-2	1803	50	-	90150	2.8	252420	G2	Forest	Fe	+45% Fe	Sectional Method
6	S-3	1435	50	-	71750	2.8	200900	G2	Forest	Fe	+45% Fe	Sectional Method
7	S-4	1407	50	-	70350	2.8	196980	G2	Forest	Fe	+45% Fe	Sectional Method
8	S-5	1155	50	-	57750	2.8	161700	G2	Forest	Fe	+45% Fe	Sectional Method
9	S-6	1127	35	-	39445	2.8	110446	G2	Forest	Fe	+45% Fe	Sectional Method
10	S-11	1301	50	-	65050	2.8	182140	G2	Forest	Fe	+45% Fe	Sectional Method
11	S-12	1817	50	-	90850	2.8	254380	G2	Forest	Fe	+45% Fe	Sectional Method
12	S-13	498	50	-	24900	2.8	69720	G2	Forest	Fe	+45% Fe	Sectional Method
13	S-14	280	50	-	14000	2.8	39200	G2	Forest	Fe	+45% Fe	Sectional Method
14	S-15	945	50	-	47250	2.8	132300	G2	Forest	Fe	+45% Fe	Sectional Method
15	S-16	973	50	-	48650	2.8	136220	G2	Forest	Fe	+45% Fe	Sectional Method
16	S-17	1251	50	-	62550	2.8	175140	G2	Forest	Fe	+45% Fe	Sectional Method
TOTAL							2012878					
17	S-2	34	50	-	1700	2.8	4760	G3	Forest	Fe	+45% Fe	Sectional Method
18	S-7	998	50	-	49900	2.8	139720	G3	Forest	Fe	+45% Fe	Sectional Method
19	S-8	811	50	-	40550	2.8	113540	G3	Forest	Fe	+45% Fe	Sectional Method
20	S-9	773	50	-	38650	2.8	108220	G3	Forest	Fe	+45% Fe	Sectional Method
21	S-10	809	50	-	40450	2.8	113260	G3	Forest	Fe	+45% Fe	Sectional Method
22	S-12	420	50	-	21000	2.8	58800	G3	Forest	Fe	+45% Fe	Sectional Method
23	S-17	15	50	-	750	2.8	2100	G3	Forest	Fe	+45% Fe	Sectional Method
TOTAL							540400					

2.2.4.2 RESOURCE CALCULATION – Lateritic Lumpy Iron Ore (+45% Fe)

Sl. No.	Cross section/ Block	Sectional Area (m²)	Influence (m)	Depth in mtr	Volume (m³)	Bulk Density (t/m³)	Resource Quantity (t)	Level of Exploration	Type of Land	Name of the radical	Grade (%)	Method used for resource estimation
1	S-13	786	50	-	39300	2.5	98250	G1	Forest	Fe	+45% Fe	Sectional Method
2	S-14	63	50	-	3150	2.5	7875	G1	Forest	Fe	+45% Fe	Sectional Method
3	S-15	423	50	-	21150	2.5	52875	G1	Forest	Fe	+45% Fe	Sectional Method
4	S-16	570	50	-	28500	2.5	71250	G1	Forest	Fe	+45% Fe	Sectional Method
TOTAL							230250					
4	S-1	407	35	-	14245	2.5	35612.5	G2	Forest	Fe	+45% Fe	Sectional Method
5	S-2	461	50	-	23050	2.5	57625	G2	Forest	Fe	+45% Fe	Sectional Method
6	S-3	766	50	-	38300	2.5	95750	G2	Forest	Fe	+45% Fe	Sectional Method
7	S-4	533	50	-	26650	2.5	66625	G2	Forest	Fe	+45% Fe	Sectional Method
8	S-5	612	50	-	30600	2.5	76500	G2	Forest	Fe	+45% Fe	Sectional Method
9	S-6	305	35	-	10675	2.5	26687.5	G2	Forest	Fe	+45% Fe	Sectional Method
10	S-11	432	50	-	21600	2.5	54000	G2	Forest	Fe	+45% Fe	Sectional Method
11	S-12	712	50	-	35600	2.5	89000	G2	Forest	Fe	+45% Fe	Sectional Method
12	S-13	16	50	-	800	2.5	2000	G2	Forest	Fe	+45% Fe	Sectional Method
13	S-14	114	50	-	5700	2.5	14250	G2	Forest	Fe	+45% Fe	Sectional Method
14	S-15	110	50	-	5500	2.5	13750	G2	Forest	Fe	+45% Fe	Sectional Method
15	S-16	194	50	-	9700	2.5	24250	G2	Forest	Fe	+45% Fe	Sectional Method
16	S-17	375	50	-	18750	2.5	46875	G2	Forest	Fe	+45% Fe	Sectional Method
TOTAL							602925					
17	S-7	460	50	-	23000	2.5	57500	G3	Forest	Fe	+45% Fe	Sectional Method
18	S-8	459	50	-	22950	2.5	57375	G3	Forest	Fe	+45% Fe	Sectional Method
19	S-9	390	50	-	19500	2.5	48750	G3	Forest	Fe	+45% Fe	Sectional Method
20	S-10	522	50	-	26100	2.5	65250	G3	Forest	Fe	+45% Fe	Sectional Method
21	S-12	84	50	-	4200	2.5	10500	G3	Forest	Fe	+45% Fe	Sectional Method
TOTAL							239375					

2.2.4.2: RESOURCE CALCULATION - Manganese Ore (+ 25% Fe)

S.N.	Cross section/ Block	Sectional Area/Block area (sq mtr)	Influence (m)	Depth in mtr	Volume (m^3)	Bulk Density (t/m^3)	Resource Quantity (t)	Level of Exploration	Type of Land	Name of the radical	Grade (%)	Method used for resource estimation
1	S-4	965.3	85	-	82150	2.6	52000	G3	Forest	Mn	+25% Mn	Sectional Method

2.2.5: Reserve / Resource Estimation Method -

2.2.5.1: Mineral Resource Estimate for Conversion to Mineral Reserve

Of the total Reserves and Resource of 4.335 million tonnes of Iron Ore, about 3.201 million tonnes is Reserves and the balance 1.135 million tonnes is Resources. To convert the Mineral Resource in Reserves, exploration by way of core drilling needs to be carried out over the entire mineralized area.

2.2.5.2: Threshold value & Cut off Parameters –

Threshold value = ~45% Fe for Haematitic Iron ore.

Threshold value = ~10% Mn for Manganese ore.

Cutoff (Iron Ore) – 52% Fe.

2.2.5.3: Mining Factors or Assumptions - Entire Iron ore ROM will be made saleable after size classification

2.2.5.4: Metallurgical Factors or Assumptions - Nil

2.2.5.5: Cost & Revenue Factors - Justification for Economic Viability: [1] Axis

Sl.No.	Item	Estimated Cost per tonne (₹)
(i)	Direct Cost	
	(a) Exploration	2
	(b) Mining	356
	(c) Beneficiation (Mechanical Only)	50
(ii)	Over-head cost	10
(iii)	Royalty	190
(iv)	Payments made to DMF	57
(v)	Payments made to NMET	4
(vi)	Payments made to GIOPF	126
(vii)	Taxes (other)	5
(viii)	Others (specify)	15
	Total	815

Estimate Cost per tonne at pit head = Rs. 615.00

Revenue per tonne at pit head = Rs. 1263.00

Factors considered:

1. Production of Iron Ore 0.5million tonnes /annum
2. Capital cost Rs. 51.9 crores
3. ASP considered based on All India Rate for the period December 2020 to November 2021 for Iron Ore below 55% Fe.

2.2.5.6: Market Assessment

There is a market demand for the Iron Ore being produced. Entire Iron ore ROM will be made saleable after size classification.

2.2.5.7: Other Modifying Factors –

The lessee applied for the grant of Environmental Clearance (EC), pursuant to which, on 19-08-2009, MoEF issued Terms of Reference (TOR) for undertaking a detailed Environmental Impact Assessment (EIA) study. However, within six months or so, i.e. on 24-02-2010, the Government of India issued a moratorium against consideration of any mining proposals for EC till the Mineral Policy for the State of Goa was finalized. The 24-02-2010 moratorium also further directed that the proposals which were then presently in the pipeline for grant of EC or for granting TOR, be returned to the project proponents.

Consequently, on account of the 24-02-2010 moratorium, further processing of the application for grant of EC for the mine did not proceed further and consequently, EC could not be processed further.

As pointed out earlier, on 19-01-2022, on the lessee's application/representation dated 08-06-2021, the said 04-01-2022 Extension Order was passed granting 50-year term in respect of the said mine. Pursuant to the said 04-01-2022 Extension Order, the lessee is in the process of applying for EC.

Similarly, as regards to Forest Clearance the lessee is in process of filing application for diversion of Forest area for mining activity. Consent to operate from Goa State Pollution Control Board (GSPCB) shall be obtained after the grant of Environmental Clearance.

2.2.5.8: Classification -

The Reserves and Resources are estimated based on the Minerals (Evidence of Mineral Contents) Rules 2015 and as per the UNFC classification guidelines the ore body is classified under Bedded Stratiform and Tabular deposit of regular habit.

Proved Mineral Reserves (UNFC Code 111):

The area where exploration by core drilling is carried out at 100x100m grid interval and the lithology is exposed in the pit within the ultimate pit limit, the reserves are considered under G1 stage of exploration, hence geological axis is G1. The reserves are calculated up to the drilled boreholes and up to the depth of ore.

These proved reserves are completely mineable by open cast mechanized mining leaving 7.5m Safety barrier from lease boundary without any hindrances. Based on the present market condition, demand for iron ore is available considering the capital cost, production & transportation cost, royalty & other taxes, the availability of financing & profits, the mining is technically and economically viable. Hence the feasibility axis is considered as F1 and economic axis is considered as E1.

Hence under UNFC classification, the Proved Reserves is coded UNFC code 111.

Probable Mineral Reserves (UNFC Code 122):

The area where the exploration by core drilling is carried out at 200x200m grid interval within the ultimate limit, the reserves are considered under G2 stage of exploration. The lateral extent of ore body is not more than 50% of grid spacing and the vertical extent up to the depth of ore body is considered. Thus, the geological axis is G2

Since these reserves are considered under probable category, the feasibility depends entirely on the confirmation of ore availability. Hence the feasibility axis is considered as F2. Based on the present market condition, demand for iron ore is available and considering the cost, the mining is technically and economically viable. Hence the economic axis is considered as E1.

Thus under UNFC classification the probable reserve is coded as UNFC 122.

Pre-feasibility Mineral Resource (UNFC Code 222):

Part of the resource under G2 scale of exploration (200x200m grid interval) which is beyond the extreme boreholes and within the ultimate stripping limit has been considered as prefeasibility mineral resource. The lateral extent of this resource has been maintained not more than 50% of the grid spacing. The geological axis is considered as G2

The feasibility of the resource depends on the confirmation to availability of ore and the future market condition for these resources cannot be ascertained. Hence feasibility axis is considered as F2 and the economic axis is considered as E2.

Thus, under UNFC classification the pre- feasibility resource is coded as UNFC code 222.

Indicated Mineral Resource (UNFC Code 332):

A part of the resource under G2 stage of exploration is not mineable due to 7.5m Safety barrier from lease boundary. These resources cannot be mined unless necessary permissions are obtained from concerned authority. Hence, for Geological axis G2, the feasibility axis is considered as F3 and the economic axis is considered as E3.

Thus, under UNFC classification the indicated mineral resource is coded UNFC code 332

Inferred Mineral Resource (UNFC Code 333):

The area in continuation of ore body, beyond the G1 and G2 stage of exploration seems to be mineralized. However, the continuity of the ore needs to be confirmed by core boreholes. Hence geological axis is considered as G3. Since no exploration is done in the area and the ore body continuity, exact quantity and quality is yet to be confirmed, the feasibility and economic axis are considered as F3 and E3 respectively.

Thus, under UNFC classification the inferred mineral resource is coded UNFC code 333.

2.2.5.9: Calculation of blocked resources – Iron Ore (+45% Fe)

Sl. No.	Reserves blocked due to	Cross section/Block	Sectional Area (m^2)	Influence (m)	Depth (m)	Volume (m^3)	Bulk Density (t/m^3)	Resource Quantity in tonnes	UNFC code	Type of Land	Name of the radical	Grade (%)	Method used for resource estimation
1	Lease Boundary	S 16	433	50	-	21650	2.8	60620	332	Forest	Fe	+45% Fe	Sectional Method
2	Lease Boundary	S 17	131	50	-	6550	2.8	18340	332	Forest	Fe	+45% Fe	Sectional Method
	Total							78960					

2.2.5.9: Calculation of blocked resources – Laterite Lumpy Iron Ore (+45% Fe)

Sl. No.	Reserves blocked due to	Cross section/Block	Sectional Area (m^2)	Influence (m)	Depth (m)	Volume (m^3)	Bulk Density (t/m^3)	Resource Quantity in tonnes	UNFC code	Type of Land	Name of the radical	Grade (%)	Method used for resource estimation
1	Lease Boundary	S-16	4	50	-	200	2.5	500	332	Forest	Fe	+45% Fe	Sectional Method
2	Lease Boundary	S-17	10	50	-	500	2.5	1250	332	Forest	Fe	+45% Fe	Sectional Method
	Total							1750					

2.2.8.10: Calculation of Reserves – Iron Ore (+45% Fe)

Sl. No	Cross Section/Block	Sectional Area (m^2)	Influence (m)	Depth (m)	Volume (m^3)	Bulk Density (t/m^3)	Reserves Quantity (t)	UNFC Code	Type of Land	Name of the of radical	Grade (%)	Method used for resource estimation
1	S-13	2020	50	-	101000	2.8	282800	111	Forest	Fe	+45% Fe	Sectional Method
2	S-14	1170	50	-	58500	2.8	163800	111	Forest	Fe	+45% Fe	Sectional Method
3	S-15	1089	50	-	54450	2.8	152460	111	Forest	Fe	+45% Fe	Sectional Method
4	S-16	790	50	-	39500	2.8	110600	111	Forest	Fe	+45% Fe	Sectional Method
	Total						**709660**					
4	S-2	1603	50	-	80150	2.8	224420	122	Forest	Fe	+45% Fe	Sectional Method
5	S-3	1435	50	-	71750	2.8	200900	122	Forest	Fe	+45% Fe	Sectional Method
6	S-4	1407	50	-	70350	2.8	196980	122	Forest	Fe	+45% Fe	Sectional Method
7	S-5	1155	50	-	57750	2.8	161700	122	Forest	Fe	+45% Fe	Sectional Method
8	S-11	1301	50	-	65050	2.8	182140	122	Forest	Fe	+45% Fe	Sectional Method
9	S-12	1817	50	-	90850	2.8	254380	122	Forest	Fe	+45% Fe	Sectional Method
10	S-13	498	50	-	24900	2.8	69720	122	Forest	Fe	+45% Fe	Sectional Method
11	S-14	280	50	-	14000	2.8	39200	122	Forest	Fe	+45% Fe	Sectional Method
12	S-15	945	50	-	47250	2.8	132300	122	Forest	Fe	+45% Fe	Sectional Method
13	S-16	540	50	-	27000	2.8	75600	122	Forest	Fe	+45% Fe	Sectional Method
14	S-17	1120	50	-	56000	2.8	156800	122	Forest	Fe	+45% Fe	Sectional Method
	Total						**1722140**					
15	S-1	1034	35	-	36190	2.8	101332	222	Forest	Fe	+45% Fe	Sectional Method
16	S-6	1127	35	-	39445	2.8	110446	222	Forest	Fe	+45% Fe	Sectional Method
	Total						211778					

Sl. No.	Cross Section/Block	Sectional Area (m^2)	Influence (m)	Depth (m)	Volume (m^3)	Bulk Density (t/m^3)	Reserves Quantity (t)	UNFC Code	Type of Land	Name of the of radical	Grade (%)	Method used for resource estimation
17	S-2	34	50	-	1700	2.8	4760	333	Forest	Fe	+45% Fe	Sectional Method
18	S-7	998	50	-	49900	2.8	139720	333	Forest	Fe	+45% Fe	Sectional Method
19	S-9	871	50	-	40550	2.8	113540	333	Forest	Fe	+45% Fe	Sectional Method
20	S-4	773	50	-	38650	2.8	108220	333	Forest	Fe	+45% Fe	Sectional Method
21	S-10	809	50	-	40450	2.8	113260	333	Forest	Fe	+45% Fe	Sectional Method
22	S-12	420	50	-	21000	2.8	58800	333	Forest	Fe	+45% Fe	Sectional Method
23	S-17	15	50	-	750	2.8	2100	333	Forest	Fe	+45% Fe	Sectional Method
	Total						540400					

2.2.5.10 Calculation of Reserves – Laterite Lumpy Iron Ore (+45% Fe)

Sl. No.	Cross Section/Block	Sectional Area (m^2)	Influence (m)	Depth (m)	Volume (m^3)	Bulk Density (t/m^3)	Reserves Quantity (t)	UNFC Code	Type of Land	Name of the of radical	Grade (%)	Method used for resource estimation
1	S-13	786	50	-	39300	2.5	98250	111	Forest	Fe	+45% Fe	Sectional Method
2	S-14	63	50	-	3150	2.5	7875	111	Forest	Fe	+45% Fe	Sectional Method
3	S-15	423	50	-	21150	2.5	52875	111	Forest	Fe	+45% Fe	Sectional Method
4	S-16	570	50	-	28500	2.5	71250	111	Forest	Fe	+45 % Fe	Sectional Method
	Total						**230250**					
4	S-2	461	50	-	23050	2.5	57625	122	Forest	Fe	+45% Fe	Sectional Method
5	S-3	766	50	-	38300	2.5	95750	122	Forest	Fe	+45% Fe	Sectional Method
6	S-4	533	50	-	26650	2.5	66625	122	Forest	Fe	+45% Fe	Sectional Method
7	S-5	612	50	-	30600	2.5	76500	122	Forest	Fe	+45% Fe	Sectional Method
8	S-11	432	50	-	21600	2.5	54000	122	Forest	Fe	+45% Fe	Sectional Method
9	S-12	712	50	-	35600	2.5	89000	122	Forest	Fe	+45% Fe	Sectional Method
10	S-13	16	50	-	800	2.5	2000	122	Forest	Fe	+45% Fe	Sectional Method
11	S-14	114	50	-	5700	2.5	14250	122	Forest	Fe	+45% Fe	Sectional Method
12	S-15	110	50	-	5500	2.5	13750	122	Forest	Fe	+45% Fe	Sectional Method
13	S-16	190	50	-	9500	2.5	23750	122	Forest	Fe	+45% Fe	Sectional Method
14	S-17	565	50	-	18250	2.5	45625	122	Forest	Fe	+45% Fe	Sectional Method
	Total						538875					
15	S-7	407	37	-	14245	2.5	35612.5	222	Forest	Fe	+45% Fe	Sectional Method
16	S-6	305	35	-	10675	2.5	26687.5	222	Forest	Fe	+45% Fe	Sectional Method
	Total						62300					

Sl. No.	Cross Section/Block	Sectional Area (m²)	Influence (m)	Depth (m)	Volume (m³)	Bulk Density (t/m³)	Reserves Quantity (t)	UNFC Code	Type of Land	Name of the of radical	Grade (%)	Method used for resource estimation
17	S-7	460	50	-	23000	2.5	57500	333	Forest	Fe	+45% Fe	Sectional Method
18	S-8	459	50	-	22950	2.5	57375	333	Forest	Fe	+45% Fe	Sectional Method
19	S-9	390	50	-	19500	2.5	48750	333	Forest	Fe	+45% Fe	Sectional Method
20	S-10	522	50	-	26100	2.5	65250	333	Forest	Fe	+45% Fe	Sectional Method
21	S-12	84	50	-	4200	2.5	10500	333	Forest	Fe	+45% Fe	Sectional Method
	Total						**239375**					

2.2.5.10: Calculation of Reserves – Manganese Ore (+25% Fe)

Sl. No.	Cross Section/Block	Sectional Area (m^2)	Influence (m)	Depth (m)	Volume (m^3)	Bulk Density (t/m^3)	Reserves Quantity (t)	UNFC Code	Type of Land	Name of the of radical	Grade (%)	Method used for resource estimation
1	S-4	965.3	85	-	82450	2.6	32000	333	Forest	Mn	+25% Mn	Sectional Method

2.2.5.11

Mineral	Iron Ore
Reserves/ Resources estimated as on	01-01-2022
UNIT of estimation	Million Tonnes

Classification	Code	Quantity			Grade	
		Forest	Non-Forest	Total	Forest	Non-Forest
A. Mineral Reserve						
1. Proved Mineral Reserve (A)	111	0.940	0	0.940	+45% Fe	-
2. Probable Mineral Reserve (A)	121	0	0	0	-	-
3. Probable Mineral Reserve (A)	122	2.261	0	2.261	+45% Fe	-
B. Remaining Resources						
1. Feasibility Mineral Resource (B)	211	0	0	0	-	-
2. Prefeasibility Mineral Resource (B)	221	0	0	0	-	-
3. Prefeasibility Mineral Resource (B)	222	0.274	0	0.274	+45% Fe	-
4. Measured Mineral Resource (B)	331	0	0	0	-	-
5. Indicated Mineral Resource (B)	332	0.081	0	0.081	+45% Fe	-
6. Inferred Mineral Resource (B)	333	0.780	0	0.780	+45% Fe	-
7. Reconnaissance Mineral Resource (B)	334	0	0	0	-	-
Total Mineral Resources (A+B)		4.336	0	4.336		-

The Reserve & Resources for Iron ore estimated as per last approved Scheme of Mining dated 05-12-2012 is as follows:

Category	UNFC Code	Quantity (Tonnes)
Probable Ore	122	1214000
Prefeasibility Mineral Resource	222	1422000
Inferred Mineral Resource	333	336000
TOTAL		2972000

The detailed surface geological and structural mapping of the mining lease area along with the surface and geological mapping of old pits where the lithi-units are exposed have been carried out. In the earlier approved Scheme of Mining dated 05-12-2012, though the Lateritic Lumpy Iron Ore was shown on the geological plan, the same was not analyzed and not considered for Reserves and Resource calculation. Samples of the exposed Lateritic Lumpy Iron ore as well as waste have been collected for confirmation of quality of the ore body, thus resulting in an upgradation of the total mineral Reserves and Resource of Iron ore.

Also, as per the guidelines of Minerals (Evidence of Mineral Contents) Rules 2015, the lateral extension of the ore body for Resource assessment is considered not more than 50% of the grid spacing of the probe points.

Hence, based on the above mentioned parameters, the entire Reserves and Resources of Iron Ore have been re-estimated.

The potential area along with the entire mineralized area is proposed to be taken up for further exploration and based on the results, the Reserve and Resources will be timely updated.

2.2.5.11

Mineral	Manganese Ore
Reserves/ Resources estimated as on	01-01-2022
UNIT of estimation	Tonnes

Classification	Code	Quantity			Grade	
		Forest	Non-Forest	Total	Forest	Non-Forest
A. Mineral Reserve						
1. Proved Mineral Reserve (A)	111	0	0	0	-	-
2. Probable Mineral Reserve (A)	121	0	0	0	-	-
3. Probable Mineral Reserve (A)	122	0	0	0	-	-
B. Remaining Resources						
1. Feasibility Mineral Resource (B)	211	0	0	0	-	-
2. Prefeasibility Mineral Resource (B)	221	0	0	0	-	-
3. Prefeasibility Mineral Resource (B)	222	0	0	0	-	-
4. Measured Mineral Resource (B)	331	0	0	0	-	-
5. Indicated Mineral Resource (B)	332	0	0	0	-	-
6. Inferred Mineral Resource (B)	333	32000	0	32000	+25% Mn	-
7. Reconnaissance Mineral Resource (B)	334	0	0	0	-	-
Total Mineral Resources (A+B)		32000	0	32000	-	-

Note: The Reserve & Resources for Manganese ore are estimated as per last approved Scheme of Mining dated 05-12-2012 and based on the Minerals (Evidence of Mineral Contents) Rules 2015 guidelines, the resources are now restricted to 333 UNFC category.

2.2.6: Future Exploration Proposal

2.2.6.1: Geological Mapping

Sl. No.	Year	Scale	Area Covered (ha)
1	2022-23	1 : 2000	70.2
2	2023-24	1 : 2000	70.2
3	2024-25	1 : 2000	70.2
4	2025-26	1 : 2000	70.2
5	2026-27	1 : 2000	70.2

2.2.6.2: Ground Geophysical Survey – Nil

Sl. No.	Type of Survey	Spacing (m)	Total line (km)	Area Covered (ha)	Latitude	Longitude
Nil	Nil	Nil	Nil	Nil	Nil	Nil

2.2.6.3: Pitting – Nil

Number of pits
Nil

Sl. No.	Year	Land type	Pit ID	Length of Pit (m)	Width of Pit (m)	Depth of Pit (m)	Latitude	Longitude
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

2.2.6.4: Trenching –

Number of Trenches - 7 Nos.

2.2.6.4.1 – Spacing

Min (m)	Max (m)	Avg (m)
100m x 100m	200m x 200m	-

2.2.6.4.2 Area Covered Under Trenching -
Co-ordinates -

Latitude	Longitude
1673000 to 1673670	399600 to 400450

Sl. No.	Trench ID	Length of Trench (m)	Width of Trench (m)	Depth of Trench (m)	Litho Unit Exposed	Average Grade (%)	Running Meters (m)	From Latitude	From Longitude	To Latitude	To Longitude
1	T-1	20	1	1	-	-	20				
2	T-2	20	1	1	-	-	20				
3	T-3	20	1	1	-	-	20				
4	T-4	20	1	1	-	-	20	1673000	399600	1673670	400450
5	T-5	20	1	1	-	-	20				
6	T-6	20	1	1	-	-	20				
7	T-7	20	1	1	-	-	20				

2.2.6.5: Exploratory Drilling

As per the Minerals (Evidence of Mineral Contents) Rules 2015 for Bedded Stratiform and Tabular deposit of regular habit, to be established under G1 stage of exploration, the grid spacing of boreholes may be 100m or closer. Hence, under rule 12(4) of MCDR 2017, to conduct detailed exploration for Iron and Manganese ore over the entire mineralized area of 29.7582 Ha., about 21 boreholes with a tentative total meterage of 1050m have been proposed over a period of 5 years. In addition about 3 non-core boreholes with meterage of 120m will be drilled in the non-mineralized area

2.2.6.5.1:Core/Non-core Drilling

Sl. No	Year	In forest area				In Non-forest				Total borehole	Total Meters (m)	Attachment
		No. of boreholes	Total Meters (m)	Type of borehole	Grid interval (m x m)	No. of boreholes	Total Meters (m)	Type of borehole	Grid interval (m x m)			
1	2022-23	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Location of the Proposed Borehole is shown on Geological Plan Plate No. 3
2	2023-24	3	150	Core	100 x 100	Nil	Nil	Nil	Nil	3	150	
3	2024-25	7	350	Core	100 x 100	Nil	Nil	Nil	Nil	7	350	
4	2024-25	3	120	Non-Core	100 x 100	Nil	Nil	Nil	Nil	3	120	
5	2025-26	11	550	Core	100 x 300	Nil	Nil	Nil	Nil	11	550	
Total		24	1170	-	-	Nil	Nil	Nil	Nil	24	1170	

2.2.6.6: Exploratory Mining – Nil

Sl. No.	year	Pit ID	Length in mtrs	Width in mtrs	Depth in mtrs	Volume (m³)
Nil	Nil	Nil	Nil	Nil	Nil	Nil

2.2.6.7: Sampling – Nil

Sl. No.	Type of Sample	Number of Samples proposed	Area Covered (ha)	Latitude	Longitude
1	Borehole Core samples	336	29.7582	N 1673050 to N 1673500	E 399700 to E 400850
2	Non-Core Sample	30	411.4418	1673615	400220
				1673050 to 1673110	399740 to 400000
3	Trench Sample	14		1673000 to 1673670	399650 to 401450

2.2.6.8: Petrology & Mineralogical Studies - Nil

Sl. No.	Type of Sample	Number of Sample proposed
Nil	Nil	Nil

Chapter 3 : MINERAL BENEFICIATION / PROCESSING

Name of The Ore/Mineral	Iron Ore

3.1: Mineralogy of the ROM ore/ Mineral:

S. No.	Valuable Mineral Name	Approx. Mineral %	Gangue Mineral/s Name	Approx. Gangue Mineral %
1	Iron Ore	56.3% Fe	Laterite & Clays	33.34% Fe

3.2: Complete Chemical Analysis of the ROM Ore/Mineral:

Iron Ore

S. No.	Radicals	S-1	S-2	S-3
1	Fe%	54.3	51.9	45.4
2	FeO%	0.015	0.020	0.025
3	Al_2O_3%	12.22	12.79	16.54
4	SiO_2%	1.46	1.54	3.61
5	Mn%	0.30	0.36	0.44
6	P%	0.030	0.035	0.039
7	TiO_2%	0.046	0.051	0.053
8	LOI%	8.17	10.89	10.04

Manganese Ore

S. No.	Radicals	M-1	M-2
1	Mn%	30.5	28.75
2	Fe%	18.3	16.7
3	SiO_2%	5.7	8.68
4	Al_2O_3%	9.4	11.42
5	S%	0.001	0.003
6	P%	0.042	0.058
7	LOI%	7.02	7.40

Copy of the Complete Chemical analysis certificate is enclosed as **Annexure No. 11.**

3.3 Crushing Section:

3.3.1: Primary Crushing

Sl. No.	Type of Crusher	Make	Capacity of Crusher (tph)	Feed Size (mm)	Product Size (mm)
1	Jaw Crusher	Extec / Sandwick	200	500	80

3.3.2: Secondary Crushing:

Sl. No.	Type of Crusher	Make	Capacity of Crusher (tph)	Feed Size (mm)	Product Size (mm)
1.	Impact Crusher	Extec / Sandwick	150	-15t	-40

3.3.3: Tertiary Crushing: Nil

Sl. No.	Type of Crusher	Make	Capacity of Crusher (tph)	Feed Size (mm)	Product Size (mm)
Nil	Nil	Nil	Nil	Nil	Nil

3.4: Grinding Section: Nil

3.4.1: Dry Grinding: Nil

Sl. No.	Type of Mill	Stages	Make of the mill	Feed Flow Rate (tph)	Feed Size (mm)	Product Size Mill Discharge (mm)	Type of screen
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

Table continued....

S. No.	Make	Aperture Size of Screen/Classifier (mm),if applicable	Classifier / Screen undersize (tph)	Classifier / Screen oversize (tph)
Nil	Nil	Nil	Nil	Nil

3.4.2: Wet Grinding: Nil

S. No.	Type of Mill	Stages	Make of the mill	Feed Flow Rate (tph)	Feed Size (mm)	Product Size (mm)	Type of screen /Classifier
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

Table continued.....

S. No.	Aperture Size of Screen/ Classifier (mm), if applicable	Classifier / Screen undersize (tph)	Classifier/ Screen Oversize (tph)	Water Requirement (l/h)	Fresh Water Requirement (l/h)	Recirculated Water (l/h)
Nil	Nil	Nil	Nil	Nil	Nil	Nil

3.5: Dry Processing:

3.5.1: Screening and Classification:

S. No.	Type of screen / classifiers	Stages	Make	Capacity (tph)	Aperture Size of Screen/ Classifier (mm), if	Feed Size (mm)	Product Size (mm)	Product quality (if applicable)
1	Mobile Screen	Double Deck, Single Stage	Extec / Sandwick/ power	250	80, 40, 10	-150	-10 +10 to -40	Nil

3.5.2: Other Operations: Nil

S. No.	Type of equipment / operation	Stages, if applicable	Make	Capacity (tph)	Feed Size (mm)	Product Size (mm)	Product-Mid (tph), if available	Product-Tail (tph)
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

3.5.3: Product Quality:

Products	Wt %	In tonnes	Size (range) mm	Complete chemical
Fines	75	375000 tonnes/yr	-10mm	51% to 55% Fe 55% to 58% Fe
Lumps	25	125000 tonnes/yr	+10mm	51% to 55% Fe 55% to 58% Fe

3.6: Wet Processing: Nil

3.6.1: Scrubbing / Washing: Nil

S. No.	Type of Scrubbers / washers	Stages, if applicable	Make	Capacity (tph)	Feed Size (mm)	Product Size (mm)	Product quality (if applicable)
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

Table continued...

S. No.	Water Requirement (l/h)	Fresh Water Requirement (l/h)	Recirculated water (l/h)
Nil	Nil	Nil	Nil

3.6.2: Screening and Classification: Nil

S. No.	Type of screen / classifiers	Stages, if applicable	Make	Capacity (tph)	Aperture Size of Screen/Classifier (mm), if applicable	Feed Size (mm)	Product Size (mm)
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

Table continued...

S. No.	Product quality (if applicable)	Water Requirement (l/h)	Fresh Water Requirement (l/h)	Recirculated water (l/h)
Nil	Nil	Nil	Nil	Nil

3.6.3: Gravity Separation: Nil

S. No.	Type of separators (jig, table, spiral,	Stages, if applicable	Make	Capacity (tph)	Feed Size (mm)	Product (Conc) (tph)	Product-Mid (tph), if available
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

Table continued...

S. No.	Product-Tail (tph)	Water Requirement (l/h)	Fresh Water Requirement (l/h)	Recirculated water (l/h)
Nil	Nil	Nil	Nil	Nil

3.6.4: Magnetic Separation: Nil

Sl. No.	Type of magnetic separators (magnetic intensity)	Stages, if applicable	Make	Capacity (tph)	Feed Size (mm)	Product-Mag (tph)	Product-Mid (tph), if available
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

Table continued....

S. No.	Product non-Mag (tph)	Water Requirement (l/h)	Fresh Water Requirement (l/h)	Recirculated water (l/h)
Nil	Nil	Nil	Nil	Nil

3.6.5: Flotation: Nil

S. No.	Type of flotation equipment (froth/column)	Stages (rougher/ cleaner, etc), if applicable	Make	Capacity (tph)	Feed Size (mm)	Product-Float (tph)	Product non-Float (tph)
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

Table continued ...

S. No.	Water Requirement (l/h)	Fresh Water Requirement (l/h)	Recirculated water (l/h)
Nil	Nil	Nil	Nil

3.6.6: Other Operations: Nil

S. No.	Type of equipment / operation	Stages, if applicable	Make	Capacity (tph)	Feed Size (mm)	Product-Conc (tph)	Product-Mid (tph), if available
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

Table continued ...

S. No.	Product-Tail (tph)	Water Requirement (l/h)	Fresh Water Requirement (l/h)	Recirculated water (l/h)
Nil	Nil	Nil	Nil	Nil

3.6.7: Product Quality (wet processing): Nil

Products	Wt %	In tonnes	Size (range) mm	Complete chemical
Concentrate	Nil	Nil	Nil	Nil
Sub-grade	Nil	Nil	Nil	Nil
Rejects	Nil	Nil	Nil	Nil

3.7: Overall Product Quality (Dry cum Wet Processing) : Dry Processing

Products	Wt %	In tonnes	Size (range) mm	Complete chemical analysis
Fines	75	375000 tonnes/yr	-10mm	51% to 55% Fe 55% to 58% Fe
Lumps	25	125000 tonnes/yr	+10mm	51% to 55% Fe 55% to 58% Fe

3.8: Disposal Method for tailing/ rejects: Nil

a) Explain the disposal method for tailing or reject from processing plant with detail chemical / mineral analysis of tailing	Nil
b) Size and capacity of tailing pond, toxic effect of such tailings, process adopted to neutralize its effect (if any)	Nil
c) Any other data (if available)	Nil

3.9: Overall water requirement of mining and mineral processing: Nil

Indicate quantity, source of supply, disposal of water and extent of recycling and chemical analysis of water	Nil

3.10: Flow sheets and charts

Material balance chart of mineral processing plant(s) (each stage of process)	**Annexure No. 14**
Attach flow sheet of beneficiation of plant(s)	Not Applicable
Any other data (if applicable)	Nil

Chapter 4 : MINING OPERATIONS

4.1: Mining **Method (Opencast)**

4.1.1: Existing Method of Mining – Mechanized

Specify in the space below:

HEMM	Combination of loaders and dumpers

4.1.2: Proposed Method of Mining- Mechanized

Specify in the space below:

HEMM	Combination of loaders and dumpers

Reasons for proposed changes – None

4.2: Operational Parameters

4.2.1: Inventory of Existing Pits & Dumps

4.2.1.1: Pits

S. No.	Pit ID	Pit Status	Area Covered by Pit (Ha)	Pit Dimension (m x m x m)
1	1A	Old inactive	0.165	55 x 30 x 14
2	1B	Old inactive	0.240	60 x 40 x 6
3	2	Old inactive	0.595	110 x 85 x 7
4	3	Old inactive	1.100	130 x 100 x 8

4.2.1.2: Dumps & Stack

4.2.1.2.1: Dump Details – Nil

S. No.	Dump ID	Dump Status	Type of Dump	Total Dump Quantity (t)	Area covered by Dump (Ha)	Height (m)	Location
1	1	Old inactive	Waste	42120	0.195	7	N 1673420 – N 1673490 E 399810 – E 399890
2	2	Old inactive	Waste	12960	0.120	6	N 1673485 – N 1673520 E 399955 – E 400005
3	3	Old inactive	Waste	10800	0.150	4	N 1673410 – N 1673480 E 399930 – E 399980
4	4	Old inactive	Waste	6480	0.090	4	N 1673250 – N 1673315 E 400065 – E 400105
5	5	Old inactive	Waste	2700	0.050	3	N 1673310 – N 1673360 E 400590 – E 400650

4.2.1.2.2: Stack Details : Nil

S. No.	Stack ID	Type of Stack	Total Stack Quantity (t)	Area covered by Stack (Ha)	Height (m)
Nil	Nil	Nil	Nil	Nil	Nil

4.2.1.3: Details Of Stabilized Dumps – Nil

Sl. No.	Dump ID	Number of Terraces	Average Height of Terraces (m)	Length of Toe Wall (m)	Length of Garland Drain (m)	Area Stabilized (ha)	Method of Stabilization
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

4.2.2: Opencast Mining

4.2.2.1: Bench Parameters - Iron Ore

Pit Id	Year	Max Height of the Benches in Over Burden (m)	Min Width of the Benches in Over Burden (m)	Slope of the Bench in Over Burden (degree)	Max Height of the Benches in Mineral (m)	Minimum Width of the Benches in Mineral (m)	Slope of the Bench in Mineral (degree)	Overall Slope of Pit (degree)	Number of Benches in Top Soil	Number of Benches in Over Burden	Number of Benches in Mineral	Max Depth of Workings (m)	Depth of Water Table (m)	Max Slope Angle of Haul Roads (1 in)	Year-Wise Development & Production Plan	Year-Wise Development & Production Section
Pit 1	2022-23	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
	2023-24	6	8	63°	6	8	63°	29°	0	5	4	54	Nil	16	Plate No. 5	Plate No. 6 to 6B
	2024-25	6	8	63°	6	8	63°	29°	0	5	3	48	Nil	16	Plate No. 5A	
	2025-26	6	8	63°	6	8	63°	29°	0	5	3	48	Nil	16	Plate No. 5B	
	2026-27	6	8	63°	6	8	63°	29°	0	3	4	42	Nil	16	Plate No. 5C	

4.2.2.2: Year wise Opencast Development- Iron Ore

Sr. No	Year	Pit ID	Bench	Direction	Bulk Density of Overburden/ Waste (BD1) (ton/m³)	Bulk Density of Iron Ore Mineral (BD2) (ton/m³)	Bulk Density of Laterite Lumpy Ore (BD3) (ton/m3)	Top Soil Volume (Length x Width x Height) (m³)	Over Burden/ Waste Volume (Length x Width x Height) (m³)	Over Burden/ Waste Quantity (t)	Iron Ore ROM Mineral Volume (Length x Width x Height) (m3)	Laterite Lumpy Ore ROM Volume (Length x Width x Height) (m3)	ROM Quantity (t)
1	2022-23	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
2	2023-24	1	198 to 246	West	2.0	2.8	2.5	280	446992	894545	88214	107200	560000
3	2024-25	1	192 to 234	West	2.0	2.8	2.5	56	411742	823636	122857	62400	500000
4	2025-26	1	192 to 234	West	2.0	2.8	2.5	256	478835	958182	169286	10400	500000
5	2026-27	1	192 to 234	West	2.0	2.8	2.5	0	517727	1035455	176571	0	500000

Sr. No	Year	Recovery	Mineral Reject (t)	Production Main (t)	Production Associated (t)	Location of Advancement	OB to Ore Ratio
1	2022-23	Nil	Nil	Nil	Nil	Nil	Nil
2	2023-24	100%	0	500000	0	N 1673000 to N 1673370 E 400270 to E 400670	1.79
3	2024-25	100%	0	500000	0	N 1673040 to N 1673380 E 400290 to E 400700	1.65
4	2025-26	100%	0	500000	0	N 1673030 to N 1673400 E 400170 to E 400740	1.92
5	2026-27	100%	0	500000	0	N 1673030 to N 1673350 E 400210 to E 400630	2.07

Fernandes
(Roshel Fernandes)
Qualified Person

उप खान नियंत्रक एवं कार्यालय प्रभारी
Deputy Controller of Mines & Officer In Charge
भारतीय खान ब्यूरो, मडगांव
Indian Bureau Of Mines, Margao

Iron Ore

S.No.	Pit ID	Total Topsoil Volume (m^3)	Total Over Burden/ Waste Volume (m^3)	Total Over Burden/ Waste Quantity (t)	Total ROM Volume (m^3)	Total ROM Quantity (t)
1	1	Nil	Nil	Nil	Nil	Nil
2	1	280	446992	891545	189414	500000
3	1	56	411762	821636	185257	500000
4	1	256	478935	958182	179686	500000
5	1	0	517727	1035455	178571	500000

4.2.2.3 Transportation & Hauling Equipment

S. No.	Type	Make	Capacity (m³)	No. of Equipments
1	Tippers	Tata	10 tons	50
2	Dumper	Bharat Benz	25 tons	9

4.3: Material Handling Summary

Slope Stability Study Report	No	(If yes attach report as annexure)
Recovery Study Report	Yes	**Annexure No. 13**
Hydrological Study Report	No	(If yes attach report as annexure)
Mineral Beneficiation Study Report	No	(If yes attach report as annexure)
Underground Rock Displacement Study Report	No	(If yes attach report as annexure)
Subsidence Study Report	No	(If yes attach report as annexure)
Geotechnical Study Report	No	(If yes attach report as annexure)
Any Other Study Report	Yes	Feasibility Study Report, **Annexure No. 16**
Bulk Density Study Report	Yes	**Annexure No. 12**

4.3.2: Insitu Mining: Iron Ore

Sl. No.	Year	Total Handling (t)	Waste Quantity (t)	ROM Quantity (t)	ROM Quantity Saleable Mineral (t)	ROM Quantity Mineral Reject (t)	OB to Ore Ratio (Waste Quantity / ROM Quantity)	Grade Range (%)
1	2022-23	Nil	Nil	Nil	Nil	Nil	Nil	Nil
2	2023-24	1394545	894545	500000	500000	0	1.79	+45%Fe
3	2024-25	1323636	823636	500000	500000	0	1.65	+45%Fe
4	2025-26	1458182	958182	500000	500000	0	1.92	+45%Fe
5	2026-27	1535455	1035455	500000	500000	0	2.07	+45%Fe

4.3.3: Dump workings :

Sl No.	Year	Dump Id	Location Latitude	Location Longitude	Area (m²)	Avg Height of Dump (m)	Volume (m³)	Total Dump Quantity (t)	Proposed Dump Handling Quantity (t) (A)	Proposed Recovery of Saleable Mineral (t)(B)	Proposed Waste Quantity (t) (A-B)	Grade Range (%)	Justification
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

4.3.4: Calculation Summary . Iron Ore

Year	2022-23	2023-24	2024-25	2025-26	2026-27	Total
(A) Total ROM quantity (t)	Nil	5,00,000	5,00,000	5,00,000	5,00,000	20,00,000
(B) Saleable ore from ROM (t)	Nil	5,00,000	5,00,000	5,00,000	5,00,000	20,00,000
(C) Proposed Dump Handling Quantity (t)	Nil	Nil	Nil	Nil	Nil	Nil
(D) Saleable Ore recovered from dump workings (t)	Nil	Nil	Nil	Nil	Nil	Nil
(E) Total Saleable Ore (t) (=B+D)	Nil	5,00,000	5,00,000	5,00,000	5,00,000	20,00,000
(F) Total Quantity Handled (t) (=A+C)	Nil	5,00,000	5,00,000	5,00,000	5,00,000	20,00,000

4.4: Machine Calculation

4.4.1: Machine Requirement Summary	
Number of Average Working Days in One Year (A)	240
Number of Shifts per Day (B)	1
Material Handling Required per Day (t) ((D)=Largest of (Q1,Q3)/(A))	6396
Material to be Handled per Shift (t) ((E)=(D)/(B))	6396
Handling Required per Hour (t) ((F)=(E)/10 hours)	639.6
Effective Shift Time	10 Hrs.

4.4.2: Shovel / Excavator Requirement

Effective Shift Time:	10.00 Hrs	0.00 min

Fernandes
(Roshel Fernandes)
Qualified Person.

14.03.22
उप खान नियंत्रक एवं कार्यालय प्रभारी
Deputy Controller of Mines & Officer In-Charge
भारतीय खान ब्यूरो, मडगांव
Indian Bureau Of Mines, Madgaon

4.4.2: Shovel / Excavator Requirement

Effective Shift Time:	20.00 Hrs	0.00 min

Sl. No.	Type	Bucket Capacity (m³/cy)	Bucket Fill Factor (B)	Swell Factor (C)	Tonnage Factor (m³/t) (D)	Machine Utilization Factor (%) (G)	Efficiency (%) (E)	Cycle time (sec) (n)	(Cy) TPH =TPH (G) =(3600 x A x B x C x D x E x U) / F)/1000	Total Hours (H) =Number of working days x Number of shifts/day x Effective shift hours	Yearly handling by one Excavator (N) =(C x H)	Maximum handling of the material by this machine during the block period (t) (I)	Number of excavator machines required (K) = (J / I)	Standby excavator (L)
1	Hydraulic Excavators	1.6	0.9	1.4	2.3	95%	85%	45	283.77	2400	681053.2	1535454	3	1

4.4.3: Dumper Requirement

Effective Shift Time:	11.00 Hrs	0.00 mins

Sl. No		
1	Total Hours=Number of working days (W)x Number of shifts/day x Effective shift hours (Machine Requirement Summary) (A)	2400
	Capacity of Dumpers (t) (H)	25
	Speed of the dumper (KM/H) (j)	20
	Load Distance (KM) (ii)	3.1
	Time taken to cover distance in minutes(n) =(ii/n) x hi	9.3
	Queuing, Loading Time at Shovel (mm) (iv)	5.66
	Queuing, Unloading Time during unloading (mm) (v)	1.5
	Total Time to complete one trip(vi) = (iii + iv + v)	16.46
	No. of Trips / hr = (60 / vi)	4
	Total transportation per hour = (8 x vii)	91.13
	Yearly handling by one dumper (ix) = A x TPH	218712
	Maximum handling of the material by this machine during the block period (t) (x)	1535454
	Number of dumpers will be (xi) = (x / ix)	7
	Price Standby dumper (xii)	2

4.4.4: Drill Machine Requirement: Nil

Effective Shift Time:	10.00 Hrs	0.00 mins

Sl. No.	Type of Drill	Depth of Hole(including Sub-grade Drilling (m)	Spacing (m)	Burden (m)	Bulk Density of Waste (t/m³)	Bulk Density of Mineral (t/m³)	Yield per Hole (t)	Yield per Meter (t/m)	Annual Target Known (t)	Drilling Requirement per Day (m)	Drilling Requirement per Shift(m)	Rate of Drilling per Hours (m/Hr)	Required Number of Drills (m/c)	Stand by Drill
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

4.4.5: Machine Deployment Details

4.4.5.1: Excavator & Loading Equipment

S.No.	Type	Make	Capacity (m³)	No. of Equipments
1	Excavator EC350	VOLVO	1.61	4
1	Excavator EC240	VOLVO	1.1	1
2	Wheel Loader L120E	VOLVO	2.46	2

4.4.5.2: Dozers Details

S.No.	Type	Make	Capacity (tonnes)	No. of Equipments
1	Ripper & Dozer	Caterpillar	250 tonnes	2
2	Dozer	Caterpillar	100 tonnes	1

4.4.5.3: Drilling Details: Nil

S.No.	Type	Make	Capacity (t)	Diameter of Hole (mm)
Nil	Nil	Nil	Nil	Nil
Nil	Nil	Nil	Nil	Nil

4.5 Blasting Requirement: Nil

4.5.1 Blasting & Explosive Requirement in Waste/Development

S.N.	Drill Pattern / Spacing of Holes (m)	Burden of Holes (m)	Number of Rows / Rings	Yield per Holes in Waste (m³)	Frequency of Blasting in a Week	Maximum Number of Holes Blasted in a Round	Charge per Hole (kg)	Charge per Round (kg)	Explosive Requirement Per Month in Development (kg)	Powder Factor in Development / Waste (kg/t)	Depth Of Hole
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

4.5.2 Blasting & Explosive Requirement in Mineral / Ore: NA

Type of Explosive	Type of Explosives used / to be Used
Nil	Nil

S.N.	Total ROM proposed to be handled in CUM/annum	Total ROM proposed to be handled in CUM/ day	Spacing of Holes (m)	Burden of Holes (m)	Number of Rows	Yield per Holes in ROM Zone (m³)	Frequency of Blasting in a Week	Maximum Number of Holes Blasted in a Round	No of Holes Required to be Blasted per Round	Charge per Hole (kg)
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

Table continued....

S.N.	Charge per Round (kg)	Explosive Requirement Per Month for ROM Zone Blasting (kg)	Powder Factor in Ore (kg/t)	Pop Shooting (no of Boulders)	Plaster Shooting (no of Boulders)	Use of Rock breaker	Capacity	Secondary Blasting Requirements	Depth Of Hole
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

4.6: Man Power Deployment

4.6.1: Managerial

Sr. No	Particulars	Number of Persons in Shift 1	Number of Persons in Shift 2	Number of Persons in Shift 3	Number of Persons in General Shift	Total No. of Persons per day
1	1st Class	Nil	Nil	Nil	1	1
2	Mining Engineer	Nil	Nil	Nil	1	1
3	Geologist	Nil	Nil	Nil	1	1
4	Others	Nil	Nil	Nil	4	4

4.6.2: Supervisory

Sl. No.	Particulars	Number of Person in Shift 1	Number of Person in Shift 2	Number of Person in Shift 3	Number of Person in General Shift	Total Number of Person per Day
1	Supervisory	Nil	Nil	Nil	4	4

4.6.3: Skilled Workers / Operators

Sr No	Particulars	Number of Persons in Shift 1	Number of Persons in Shift 2	Number of Persons in Shift 3	Number of Persons in General Shift	Total No. of Persons per day
1	Workers/ Operator	Nil	Nil	Nil	30	30

4.6.4: Semi-skilled Workers

S.No	Number of Persons in Shift 1	Number of Persons In Shift 2	Number of Persons in Shift 3	Number of Persons in General Shift	Total No. of Persons per day
1	Nil	Nil	Nil	6	6

4.6.5: Unskilled Workers

S.No	Number of Persons in Shift 1	Number of Persons in Shift 2	Number of Persons in Shift 3	Number of Persons in General Shift	Total No. of Persons per day
1	Nil	Nil	Nil	5	5

4.6.6: No of Persons Engaged Per Day

Number of Persons in Shift 1	Number of Persons in Shift 2	Number of Persons in Shift 3	Number of Persons in General Shift	Total No. of Persons per day
Nil	Nil	Nil	52	52

No of Shifts per Day ((A) = Machine Requirement Summary (B))	1
Average Daily Employment per Shift ((B) – (Total Number of Person per Day) / (A))	52
Material to be Handled per Shift ((C) = Machine Requirement Summary (E))	6396

4.6.7: Supervision

Sl. No.	Particulars	Qualification	Requirement / Proposed	In Position / Existing Strength	(-) Shortage / (+) Excess	Remarks
1	Mine Foreman	Diploma (Mining Engineering)	2 Persons	Nil	Nil	-
2	Mine Mate	Std X	2 persons	Nil	Nil	-
3	Trainee Mining Engineer	Degree / Diploma (Mining Engineering)	2 persons	Nil	Nil	-

4.7: Waste Management

4.7.1: Existing Dump – Nil

Sl. No.	Year	Dump Id	Type of Dump	Proposed Area (ha)	Height (m)	Total Dump Quantity (m^3)	Existing Dump Location
1	-	1	Waste	Nil	7	42120	N 1673420 – N 1673490 E 399810 – E 399880
2	-	2	Waste	Nil	6	12961	N 1673485 – N 1673520 E 399955 – E 400005
3	-	3	Waste	Nil	4	108001	N 1673410 – N 1673480 E 399930 – E 399980
4	-	4	Waste	Nil	4	6480	N 1673280 – N 1673315 E 400065 – E 400105
5	-	5	Waste	Nil	3	2700	N 1673310 – N 1673360 E 400590 – E 400650

4.7.2: New Dump

Sl. No.	Year	Dump Id	Type of Dump	Proposed Area (ha)	Height (m)	Total Dump Quantity (m^3)	New Dump Location
1	2022-23	Nil	Nil	Nil	Nil	Nil	Nil
2	2023-24	Dump-4	Waste	1.4964	10	894545	N 1673250 – N 1673550 E 400000 – E 400350
3	2024-25	Dump-4	Waste	1.6813	10	823636	N 1673350 – N 1673570 E 399950 – E 400350
4	2025-26	Dump-4	Waste	5.1926	10	958182	N 1673050 – N 1673370 E 399750 – E 400150
5	2026-27	Dump-4	Waste	2.1669	20	1035455	N 1673200 – N 1673480 E 399750 – E 400200

4.7.3: Existing Stack: Nil

Sl. No.	Year	Stack ID	Type of Stack	Proposed Area (ha)	Height (m)	Total Stack Quantity (m^3)	Existing Stack Location
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

4.7.4: New Stack: Stacking and Screening / Crushing of mineral will be done within the mining Pit.

Sl. No.	Year	Stack ID	Type of Stack	Proposed Area (ha)	Height (m)	Total Stack Quantity (m^3)	New Stack Location
1	2022-23	Nil	Nil	Nil	Nil	Nil	Nil
2	2023-24	Stack	ROM	0.91	10 to 15	189474	N 1673050 - N 1673250 E 400601 - E 400450
3	2024-25	Stack	ROM	0.95	10 to 15	185257	N 1673050 - N 1673250 E 400320 - E 400470
4	2025-26	Stack	ROM	0.92	10 to 15	179686	N 1673050 - N 1673250 E 400200 – E 400350
5	2026-27	Stack	ROM	0.85	10 to 15	178571	N 1673120 – N 1673260 E 400400 - E 400550

4.8: Mineral Waste Handling To Utilize As Minor Mineral: Nil

Sl. No.	Year	Dump Id	Type of Dump	Proposed Area (ha)	Quantity Handled (t)	Quantity Recovered (t)	Name Of Minor Mineral	Alternative Waste Utilization (m^3)
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

4.9: Use of Minerals

Sl. No.	Proposed Use Of Mineral	Name Of Mineral	Relevant Use Of Mineral	Physical Specifications	Chemical Specifications
1	Direct selling	Iron ore	Steel and allied industry	0-10mm & +10-40mm	+45% Fe

Chapter 5 : SUSTAINABLE MINING

5.1: Sustainable Mining and SDF Implementations in Compliance of Rule 35 of MCDR'2017

The Mining Lease bearing No. 5/FeMn/79 dated 13-12-1979 was duly registered in the office of the Sub Registrar of Quepem Taluka on 3-6-1983 under Registered No. 172 at Book I, Vol. 3 at pages 77 to 85. Subsequently, the State Government in terms of subsection (3) of Section 8A of MMRD Act, 1957 (read with sub section 6 of Section 8A of MMDR Act, 1957) vide its Order no. 96/51/99-Mines/1890 dated 04-01-2022 has granted the Mining Lease up to 12-12-2029.

SDF implementation during the plan period 2022-23 to 2026-27 will be carried out as per proposal in accordance of Rule 35 of MCDR 2017. Sustainable Development Unit (SDU) at Mine level will be constituted comprising of Technical, Financial, CSR, HRD and Environmental Heads for ensuring implementation of SDF principles. Efforts will be made to fully comply with implementation of Environment protection, CSR & welfare activities in the peripheral area of the mine.

Community of the area will be engaged in carrying out welfare activities such as organizing Health camps, providing transportation facility, uniforms, books, etc. to the students. Also awareness camps will be conducted in Schools for higher education and carrier guidance.

Initial and periodic medical examination of the workmen will be also carried out. Additionally the work men will be vocationally trained to upgrade their skills.

Additionally, we will be also contributing Royalty, District Mineral Fund (DMF), Goa Iron Ore Permanent Fund (GIOPF) and National Mineral Exploration Trust (NMET).

A Geo-reference Cadastral Plan superimposed on a High resolution Cartosat 2C MX satellite image is enclosed as plate no. 10A

Compliance of Vishakha Committee Guidelines for prevention of women harassment at workplace: Not Applicable

5.2: CSR Initiatives

5.2.1: YEAR 2- 2023-24	
Details of Work Proposed during the Year / Measures Planned for the Affected Segment	**Cumulative Work done / Measures Taken**
5.2.1.1: Area to be Developed for Recreation	
Area (Ha)	Area (Ha)
0.02	0.02
5.2.1.2: Area for Water Storage & Recharge Facility	
Area (Ha)	Area (Ha)
2.44	2.44
5.2.1.3: Efforts Made towards Housing for Local Communities • There is no habitation with the lease	
Number of Houses	Number of Houses
0	0
5.2.1.4: Efforts Made towards Providing Transport to Local Communities • Transportation facility for students will be provided	
Number of Beneficiaries	Number of Beneficiaries
25	25
5.2.1.5: Efforts Made towards Providing Healthcare to Local Communities • Free healthcare camps will be conducted in the village every year • Ambulance / Vehicle will be arranged for the local community whenever required • Health awareness programmes	
Number of Beneficiaries	Number of Beneficiaries
25	25
5.2.1.6: Efforts Made towards Providing Hygiene & Sanitation to Local Communities • Cleaning of drains will be carried out. • Efforts will be made to provide clean drinking water • Awareness on sanitation will made through publicity and propaganda.	
Number of Beneficiaries	Number of Beneficiaries
40	40
5.2.1.7: Efforts Made towards Skill Development Programs to Local Communities • By providing support to Self- help groups • Need based Computer training • Promotion of skill development through competitions at school level • Sports promotion	
Number of Beneficiaries	Number of Beneficiaries
40	40
5.2.1.8: Efforts Made to Promote Education & Knowledge Based Initiatives • Scholarships for the higher studies will be provided to meritorious students • Organizing tuition classes	

• Distribution of School uniform, note books and facilitating transport to Schools	
Number of Beneficiaries	Number of Beneficiaries
2	20
5.2.1.9: Communication Facilities Provided to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
15	15
5.2.1.10: Any Other Steps Taken for Improving the Socio-Economic Standard of Local Communities • By engagement of local trucks for mineral transportation and engagement of locals for carrying out environmental protection work	
Number of Beneficiaries	Number of Beneficiaries
50	50
5.2.1.11: Adoption of ODF	
Number of Toilets Built inside the Lease Area	Number of Toilets Built outside the Lease Area	Number of Beneficiaries
2	0	100
5.2.1.12: Awareness Program among Mine Workers for Swatchata	
Number of Swatchata Programmes proposed:	Number of Swatchata Programmes Held:
1	2
5.2.1.13: Efforts for green energy	
Total energy consumption (kWh)	Green energy consumption (% of total)
20000	1%
5.2.1.14: Water & recycled use	
Total water consumption (KLD)	Water recycled (% of total)
135	15%

5.2.1: YEAR 3- 2024-25	
Details of Work Proposed during the Year / Measures Planned for the Affected Segment	**Cumulative Work done / Measures Taken**
5.2.1.1: Area to be Developed for Recreation	
Area (Ha)	Area (Ha)
0	0.02
5.2.1.2: Area for Water Storage & Recharge Facility	
Area (Ha)	Area (Ha)
7.7208	10.1608
5.2.1.3: Efforts Made towards Housing for Local Communities • There is no habitation with the lease	
Number of Houses	Number of Houses
0	0
5.2.1.4: Efforts Made towards Providing Transport to Local Communities • Transportation facility for students will be provided	
Number of Beneficiaries	Number of Beneficiaries
25	25
5.2.1.5: Efforts Made towards Providing Healthcare to Local Communities • Free healthcare camps will be conducted in the village every year • Ambulance / Vehicle will be arranged for the local community whenever required • Health awareness programmes	
Number of Beneficiaries	Number of Beneficiaries
25	25
5.2.1.6: Efforts Made towards Providing Hygiene & Sanitation to Local Communities • Cleaning of drains will be carried out. • Efforts will be made to provide clean drinking water • Awareness on sanitation will made through publicity and propagatda	
Number of Beneficiaries	Number of Beneficiaries
40	40
5.2.1.7: Efforts Made towards Skill Development Programs to Local Communities • By providing support to Self- help groups • Need based Computer training • Promotion of skill development through competitions at school level • Sports promotion	
Number of Beneficiaries	Number of Beneficiaries
40	40
5.2.1.8: Efforts Made to Promote Education & Knowledge Based Initiatives • Scholarships for the higher studies will be provided to meritorious students • Organizing tuition classes • Distribution of School uniform, note books and facilitating transport to Schools	

Number of Beneficiaries	Number of Beneficiaries
20	20

5.2.1.9: Communication Facilities Provided to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
15	15

5.2.1.10: Any Other Steps Taken for Improving the Socio-Economic Standard of Local Communities –

- By engagement of local trucks for mineral transportation and engagement of locals for carrying out environmental protection work.

Number of Beneficiaries	Number of Beneficiaries
50	50

5.2.1.11: Adoption of ODF		
Number of Toilets Built inside the Lease Area:	Number of Toilets Built inside the Lease Area:	Number of Toilets Built inside the Lease Area:
0	0	0

5.2.1.12: Awareness Program among Mine Workers for Swatchata	
Number of Swatchata Programmes proposed:	Number of Swatchata Programmes proposed.
1	1

5.2.1.13: Efforts for green energy	
Total energy consumption (KWh)	Green energy consumption (% of total)
20000	1%

5.2.1.14: Water & recycled use	
Total water consumption (KLD)	Water recycled (% of total)
135	15%

5.2.1: YEAR - 2025-26	
Details of Work Proposed during the Year / Measures Planned for the Affected Segment	Cumulative Work done / Measures Taken
5.2.1.1: Area to be Developed for Recreation	
Area (Ha)	Area (Ha)
0 C	0.02
5.2.1.2: Area for Water Storage & Recharge Facility	
Area (Ha)	Area (Ha)
0.7433	10.9047
5.2.1.3: Efforts Made towards Housing for Local Communities • There is no habitation with the leasc	
Number of Houses	Number of Houses
0	0
5.2.1.4: Efforts Made towards Providing Transport to Local Communities • Transportation facility for students will be provided	
Number of Beneficiaries	Number of Beneficiaries
25	75
5.2.1.5: Efforts Made towards Providing Healthcare to Local Communities • Free healthcare camps will be conducted in the village every year • Ambulance / Vehicle will be arranged for the local community whenever required • Health awareness programmes	
Number of Beneficiaries	Number of Beneficiaries
25	75
5.2.1.6: Efforts Made towards Providing Hygiene & Sanitation to Local Communities • Cleaning of drains will be carried out. • Efforts will be made to provide clean drinking water • Awareness on sanitation will made through: publicity and propaganda.	
Number of Beneficiaries	Number of Beneficiaries
40	120
5.2.1.7: Efforts Made towards Skill Development Programs to Local Communities • By providing support to Self- help groups • Need based Computer training • Promotion of skill development through competitions at school level • Sports promotion	
Number of Beneficiaries	Number of Beneficiaries
40	120
5.2.1.8: Efforts Made to Promote Education & Knowledge Based Initiatives • Scholarships for the Higher studies will be provided to meritorious students • Organizing tuition classes • Distribution of School uniform, note books and facilitating transport to Schools	

Number of Beneficiaries	Number of Beneficiaries
20	60

5.2.1.9: Communication Facilities Provided to Local Communities

Number of Beneficiaries	Number of Beneficiaries
15	45

5.2.1.10: Any Other Steps Taken for Improving the Socio-Economic Standard of Local Communities –

- By engagement of local trucks for mineral transportation and engagement of locals for carrying out environmental protection work.

Number of Beneficiaries	Number of Beneficiaries
50	150

5.2.1.11: Adoption of ODF

Number of Toilets Built inside the Lease Area:	Number of Toilets Built outside the Lease Area:	Number of Beneficiaries
0	0	300

5.2.1.12: Awareness Program among Mine Workers for Swatchata

Number of Swatchata Programmes proposed.	Number of Swatchata Programmes Held:
1	0

5.2.1.13: Efforts for green energy

Total energy consumption: (KWh)	Green energy consumption (% of total)
20000	1%

5.2.1.14: Water & recycled use

Total water consumption (KLD)	Water recycled (% of total)
1.65	15%

5.2.1: YEAR - 2026-27	
Details of Work Proposed during the Year / Measures Planned for the Affected Segment	**Cumulative Work done / Measures Taken**
5.2.1.1: Area to be Developed for Recreation	
Area (Ha)	Area (Ha)
0.0	0.02
5.2.1.2: Area for Water Storage & Recharge Facility	
Area (Ha)	Area (Ha)
0.8919	11.7960
5.2.1.3: Efforts Made towards Housing for Local Communities • There is no habitation with the lease	
Number of Houses	Number of Houses
0	0
5.2.1.4: Efforts Made towards Providing Transport to Local Communities • Transportation facility for students will be provided	
Number of Beneficiaries	Number of Beneficiaries
25	100
5.2.1.5: Efforts Made towards Providing Healthcare to Local Communities • Free healthcare camps will be conducted in the village every year • Ambulance / Vehicle will be arranged for the local community whenever required • Health awareness programmes	
Number of Beneficiaries	Number of Beneficiaries
25	100
5.2.1.6: Efforts Made towards Providing Hygiene & Sanitation to Local Communities • Clearing of drains will be carried out • Efforts will be made to provide clean drinking water • Awareness on sanitation will made through publicity and propaganda.	
Number of Beneficiaries	Number of Beneficiaries
40	160
5.2.1.7: Efforts Made towards Skill Development Programs to Local Communities • By providing support to Self- help groups • Need based Computer training • Promotion of skill development through competitions at school level • Sports promotion	
Number of Beneficiaries	Number of Beneficiaries
40	160
5.2.1.8: Efforts Made to Promote Education & Knowledge Based Initiatives • Scholarships for the higher studies will be provided to meritorious students • Organizing tuition classes • Distribution of School uniform, note books and facilitating transport to Schools	

Number of Beneficiaries	Number of Beneficiaries
20	100

5.2.1.9: Communication Facilities Provided to Local Communities

Number of Beneficiaries	Number of Beneficiaries
15	60

5.2.1.10: Any Other Steps Taken for Improving the Socio-Economic Standard of Local Communities –

- By engagement of local trucks for mineral transportation and engagement of locals for carrying out environmental protection work

Number of Beneficiaries	Number of Beneficiaries
50	200

5.2.1.11: Adoption of ODF

Number of Toilets Built inside the Lease Area:	Number of Toilets Built outside the Lease Area:	Number of Beneficiaries
0	0	410

5.2.1.12: Awareness Program among Mine Workers for Swatchata

Number of Swatchata Programmes proposed:	Number of Swatchata Programmes Held
1	0

5.2.1.13: Efforts for green energy

Total energy consumption (KWh)	Green energy consumption (% of total)
20000	1%

5.2.1.14: Water & recycled use

Total water consumption (KLD)	Water recycled (% of total)
135	15%

5.3: Rehabilitation & Resettlement Of Affected Persons :

Particular	Year 1	Year 2	Year 3	Year 4	Year 5
Proposed Number of Project Affected Persons(PAP)	0	0	0	0	0
Proposed Number of Person for Alternate Arrangement for Sustainable Livelihood	0	0	0	0	0
Proposed Number of Person for Skill Training	0	15	15	15	15
Proposed Number of Person Likely to get Direct Employment	0	52	52	52	52
Proposed Number of Person Likely to get Indirect Employment	0	200	200	200	200
Proposed Project Affected Families Skilled and Absorbed	0	0	0	0	0
Proposed Number of Project Affected Families	0	0	0	0	0

Chapter 6 : PROGRESSIVE MINE CLOSURE PLAN

6.1: Status of Land

Total Area Degraded					Total mined out area Reclaimed and Rehabilitated			Other Areas Reclaimed and Rehabilitated	
Total area under excavation in the lease		Area under Dumps (in hect)	Area under utility services (in hect)	Area under Stack yards (in hect)	Mined out Area Reclaimed but not rehabilitated (in hect)	Mined out Area fully Rehabilitated from Reclaimed area (in hect)	Area under Water Reservoir considered Rehabilitated (in hect)	Stabilized Waste dump Rehabilitated (in hect)	Virgin area under Green Belt (in hect)
Area under mining operation	Mined Out area in the lease								
2.44	Nil	0.605	1.00	Nil	Nil	Nil	Nil	Nil	3.1593

6.2: Progressive Reclamation and Rehabilitation Plan

6.2.1: Backfilling: Nil

Quantity of Waste / Fill Material Available at Site (m^3)	Nil
Availability of Top Soil for Spreading (m^3)	Nil
Spread Area (m^2)	Nil

Year Wise Proposal – Nil						
Sr No	Year	Pit ID	Area (m^2)	Top RL	Bottom RL	Estimated Expenditure (INR)
Nil	Nil	Nil	Nil	Nil	Nil	Nil

6.2.2: Water Reservoir :

Average Rainfall of The Area (mm)	4000 mm
Proposed Area under Water Storage	Nil

6.2.2.1: Preparations For Ground Water Recharging : Nil

6.2.2.1.1: Drilling Holes	
Year	Proposed no of Holes to be Drilled
2022-23	Nil
2023-24	Nil
2024-25	Nil
2025-26	Nil
2026-27	Nil

6.2.2.1.2:Preparation of Course Gravel Bed – Nil

Year	Proposed Area of Bed (LxW)
2022-23	Nil
2023-24	Nil
2024-25	Nil
2025-26	Nil
2026-27	Nil

Please specify, if others- Nil

6.2.2.2: Protective measures (Please specify running meter)

6.2.2.2.1: Fencing - Nil			
Year	Proposed Fencing Length (m)	Co-ordinates from	Co-ordinates to
2022-23	Nil	Nil	Nil
2023-24	Nil	Nil	Nil
2024-25	Nil	Nil	Nil
2025-26	Nil	Nil	Nil
2026-27	Nil	Nil	Nil

6.2.2.2.2: Retaining Wall -			
Year	Proposed Wall Length (m)	Co-ordinates from	Co-ordinates to
2022-23	Nil	Nil	Nil
2023-24	320	N 1673260 E 400310	N 1673500 – E 400360
2024-25	450	N 1673400 - E 399980	N 1673560 – E 400360
2025-26	450	N 1673080 - E 399820	N 1673300 – E 400140
2026-27	200	N 1673320 - E 399840	N 1673450 – E 400020

6.2.2.2.3: Garland Drains - Trench along the Toe of proposed dump			
Year	Proposed Trench Length (m)	Co-ordinates from	Co-ordinates to
2022-23	Nil	Nil	Nil
2023-24	290	N 1673260 - E 400100	N 1673610 - E 400360
2024-25	400	N 1673400 – E 399980	N 1673560 – E 400360
2025-26	400	N 1673080 – E 399610	N 1673300 – E 400140
2026-27	Nil	Nil	Nil

6.2.3: Green Belt Development

6.2.3.1: Cumulative work done (upto end of previous block of five years)				
Sr. No	Total Expenditure Incurred up to Last Year (INR)	Area Covered (Ha)	Number of Plants	Survival Rate (%)
Nil	Nil	Nil	Nil	Nil

6.2.3.2: Year Wise Proposal						
Sr. No	Year	Green Belt Location (s)	Area Proposed to be Covered (Ha)	Number of Plants Proposed	Expected Survival Rate (%)	Estimated Expenditure (INR)
Nil	Nil	Nil	Nil	Nil	Nil	Nil

6.2.4: Use of shallow pits: Nil

6.2.4.1: Cumulative work done (upto end of previous block of five years)				
Sr. No	Pit ID	Work Done	Area covered (m²)	Total Expenditure Incurred (up to last five year block) (INR)
Nil	Nil	Nil	Nil	Nil

6.2.4.2: Year Wise Proposal									
Sr. No	Year	Pit ID	Total Area (Ha)	Area Proposed for Crops (Ha)	Suitable Crops	Area Proposed for Grass (Ha)	Total Proposed Expenditure (INR)	Location (s)	Remarks
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

6.2.5: Pisciculture : Nil

6.2.5.1: Total Expenditure incurred as on Date (INR)	Nil

6.2.5.2: Cumulative work done as on Date			
Sr. No	Pit ID	Area (m²)	Expenditure (INR)
Nil	Nil	Nil	Nil

6.2.5.3: Year Wise Proposal				
Sr. No	Year	Pit ID	Area (m^2)	Estimated Expenditure (INR)
Nil	Nil	Nil	Nil	Nil

6.2.5.4: Source of Water for Pisciculture	Nil
6.2.5.5: Whether the quality of water has been assessed & found to be suitable for Pisciculture	Nil

6.2.6: Recreational Facility - Nil

6.2.6.1: Total Expenditure Incurred (up to last five year block) (INR)	Nil

6.2.6.2: Cumulative work done as on Date			
Sr. No	Pit ID	Area (m^2)	Expenditure (INR)
Nil	Nil	Nil	Nil

6.2.6.3: Year Wise Proposal					
Sr No	Year	Type of Recreational Facility	Area Covered (Ha)	Location	Estimated Expenditure (INR)
Nil	Nil	Nil	Nil	Nil	Nil
Nil	Nil	Nil	Nil	Nil	Nil

6.2.7: Dump Area Stabilization & Development										
Sr. No	Year	Dump ID	No of Terraces	Average Height of Terraces (m)	Length of Toe Wall (m)	Length of Garland Drain (m)	Area Stabilized (Ha)	Method of Stabilization	Estimated Expenditure (INR)	No of Check Dams
1	2022-23	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
2	2023-24	Dump-4	6	10	330	290	Nil	Nil	Nil	Nil
3	2024-25	Dump-4	6	10	450	400	1.46	Plantation	Nil	Nil
4	2025-26	Dump-4	4	10	450	400	1.00	Plantation	Nil	Nil
5	2026-27	Dump-4	4	10	200	Nil	1.55	Plantation	Nil	Nil

The existing waste dumps are inactive old dumps covered with vegetation. Wherever possible, plantations by way of gap-filling will be carried out during the plan period.

6.2.8: Other Form of Reclaiming the Area : Nil

6.2.8.1: Cumulative work done as on Date		
Sr. No	Total Expenditure incurred as on Date (INR)	Work Done
Nil	Nil	Nil

6.2.8.2: Year Wise Proposal			
Sr. No	Year	Work Proposals	Estimated Expenditure (INR)
1	2022-23	Nil	Nil
2	2023-24	Nil	Nil
3	2024-25	Nil	Nil
4	2025-26	Nil	Nil
5	2026-27	Nil	Nil

6.2.9: Topsoil Management:

A very negligible amount of top soil generation is anticipated during mining. Any generation of top soil will be concurrently utilized for the purpose of plantation. Hence there will be no separate stacking of top soil.

6.2.9.1: Cumulative Work Done as on Date				
Sl. No.	Top Soil Generated (m^3)	Top Soil Utilized (m^3)	Topsoil Stored (m^3)	Total expenditure incurred as on date (₹)
Nil	Nil	Nil	Nil	Nil

6.2.9.2: Year Wise Proposal				
Year	Topsoil Generated (m^3) (A)	Topsoil Utilized (m^3) (B)	Topsoil Stored (m^3) (A-B)	Estimated Expenditure (INR)
2022-23	Nil	Nil	Nil	Nil
2023-24	280	280	Nil	Nil
2024-25	56	56	Nil	Nil
2025-26	256	256	Nil	Nil
2026-27	Nil	Nil	Nil	Nil

6.2.10: Tailings Dam Management: Nil

Year	Yearly generation of Tailing (m^3) (A)	Total capacity of Tailing Pond (m^3)	Measures Proposed for Periodic Desilting	Yearly Utilization of Tailing (m^3) (B)	Disposal of Tailing to Tailing Pond (m^3) (A-B)	Tailing Dam Design	Structural Stability Studies
2022-23	Nil	Nil	Nil	Nil	Nil	Nil	Nil
2023-24	Nil	Nil	Nil	Nil	Nil	Nil	Nil
2024-25	Nil	Nil	Nil	Nil	Nil	Nil	Nil
2025-26	Nil	Nil	Nil	Nil	Nil	Nil	Nil
2026-27	Nil	Nil	Nil	Nil	Nil	Nil	Nil

6.2.11 *Land Use of Lease Area At The Expiry Of Lease Period (Conceptual Stage)*

Total Area Degraded				Non Degraded area	Total mined out area Reclaimed and Rehabilitated			Other Areas Reclaimed and Rehabilitated			
Mined Out area in the lease	Area under Dumps (in hect)	Area under the Tailing Dam	Area under utility services (in hect)	Area undisturbed /virgin	Mined out Area Reclaimed but not rehabilitated (in hect)	Mined out Area fully Rehabilitated from Reclaimed area (in hect)	Area under Water Reservoir considered Rehabilitated (in hect)	Stabilized Waste dump Rehabilitated (in hect)	Virgin area under Green Belt (in hect)	Rehabilitated Area under utility services (in hect)	Rehabilitated Area under Tailing dam (in hect)
21.8524	13.5887	0	5.2442	26.3553	0	0	21.8524	13.5887	3.1593	2.6528	0

Chapter 7 : FINANCIAL ASSURANCE/ PERFORMANCE SURETY

(AREA PUT TO USE)

7.1 YEAR -1 (2022-23)

Sl. No.	Particular	Area put to use at Start of Year (ha) (A)*	Additional Requirement (ha) (B)*	Total (ha) (C = A + B)
1	Area under Mining	2.44	0	2.44
2	Topsoil stacking	0	0	0
3	Overburden/ Waste Dumping	0.605	0	0.605
4	Mineral Storage	0	0	0
5	Infrastructure (Workshop, Administrative Building etc.)	0	0	0
6	Roads	1.000	0	1.000
7	Railways	0	0	0
8	Tailing Pond	0	0	0
9	Effluent Treatment Plant	0	0	0
10	Mineral Separation Plant	0	0	0
11	Township Area	0	0	0
	Total	**4.045**	**0.00**	**4.045**

YEAR -2 (2023-24)

Sl. No.	Particular	Area put to use at Start of Year (ha) (A)*	Additional Requirement (ha) (B)*	Total (ha) (C = A + B)
1	Area under Mining	2.44	7.2512	9.6912
2	Topsoil stacking	0	0	0
3	Overburden/ Waste Dumping	0.605	4.6862	5.2912
4	Mineral Storage	0	0	0
5	Infrastructure (Workshop, Administrative Building etc.)	0	0.0531	0.0531
6	Roads	1.000	-0.1501	0.8499
7	Railways	0	0	0
8	Tailing Pond	0	0	0
9	Effluent Treatment Plant	0	0	0
10	Mineral Separation Plant	0	0	0
11	Township Area	0	0	0
12	Protective Measures	0	0.3355	0.3355
	Total	4.049	12.1559	16.2009

YEAR -3 (2024-25)

Sl. No.	Particular	Area put to use at Start of Year (ha) (A)*	Additional Requirement (ha) (B)*	Total (ha) (C = A + B)
1	Area under Mining	9.6712	1.0113	10.6825
2	Topsoil stacking	0	0	0
3	Overburden/ Waste Dumping	5.2912	1.8778	7.169
4	Mineral Storage	0	0	0
5	Infrastructure (Workshop, Administrative Building etc)	0.0531	0	0.0531
6	Roads	0.8499	-0.5036	0.3463
7	Railways	0	0	0
8	Tailing Pond	0	0	0
9	Effluent Treatment Plant	0	0	0
10	Mineral Separation Plant	0	0	0
11	Township Area	0	0	0
12	Protective Measures	0.3555	0.2374	0.5729
	Total	16.2109	2.6227	18.8236

Year-4 (2025-26)

Sl. No.	Particular	Area put to use at Start of Year (ha) (A)*	Additional Requirement (ha) (B)*	Total (ha) (C = A + B)
1	Area under Mining	10.6825	2.9206	13.6031
2	Topsoil stacking	0	0	0
3	Overburden/ Waste Dumping	7.169	5.0273	12.1963
4	Mineral Storage	0	0	0
5	Infrastructure (Workshop, Administrative Building etc)	0.0531	0	0.0531
6	Roads	0.3461	0.0677	0.4138
7	Railways	0	0	0
8	Tailing Pond	0	0	0
9	Effluent Treatment Plant	0	0	0
10	Mineral Separation Plant	0	0	0
11	Township Area	0	0	0
12	Protective Measures	0.5729	0.2867	0.8596
	Total	18.8236	8.3023	27.1259

YEAR -5 (2026-27)

Sl. No.	Particular	Area put to use at Start of Year (ha) (A)*	Additional Requirement (ha) (B)*	Total (ha) (C = A +B)
1	Area under Mining	13.6031	0	13.6031
2	Topsoil stacking	0	0	0
3	Overburden/ Waste Dumping	12.1963	1.0442	13.2405
4	Mineral Storage	0	0	0
5	Infrastructure (Workshop, Administrative Building etc.)	0.0531	0	0.0531
6	Roads	0.4138	-0.0356	0.3782
7	Railways	0	0	0
8	Tailing Pond	0	0	0
9	Effluent Treatment Plant	0	0	0
10	Mineral Separation Plant	0	0	0
11	Township Area	0	0	0
12	Protective Measures	0.8596	0.042	0.9076
Total		**27.1259**	**1.0506**	**28.1765**

Note: A very negligible amount of top soil generation is anticipated during mining. Any generation of top soil will be concurrently utilized for the purpose of plantation. Hence there will be no separate stacking of top soil.

Dry crushing and screening has been proposed within the pit area and hence no additional area is utilized for mineral separation plant.

7.2 Financial Assurance

Category-A Mining Lease

Total Area Proposed to be put to use in hect (Year 1 to 5)	Amount of Bank Guarantee (Lac INR)	Valid till (dd/mm/yyyy)	Upload copy of Bank Guarantee
28.30	141.50 Lakhs INR	31-03-2027	Copy of the Bank guarantee is attached as **Annexure No. 17**

7.3 Performance Security - Not Applicable

Lease Category (A/B)	Total Resources in tonnes for calculation of Performance Surety*	Existing Performance surety amount in Rs	Valid till (dd/mm/yyyy)	Upload copy of existing Performance Security
Nil	Nil	Nil	Nil	Nil

Chapter 8 : REVIEW OF PREVIOUS PROPOSALS

(Not applicable for fresh grant)

8.1: General:

During the block period 2017-18 to 2021-22, there was no approved Mining Plan. The reason for not filing Review of Mining Scheme after 31-03-2017 has been stated as under:

- Though the lessee was entitled to receive a 50-year term extension Order under the provisions of the newly inserted S. 8A, MMDR, 1957, no such orders were forthcoming from the State Government in respect of the said mining lease.
- In view of Rule 24-A(6), MCR-1960 (inserted w.e.f. from 18.7.2014), the lease period of the mining lease stood extended only till 18.7.2016.
- It was only pursuant to the lessee's application dated 8.6.2021 that the Said 4.1.2022 Extension Order came to be passed and was received by the lessee on 19.1.2022.
- Thus, in view of there being complete uncertainty surrounding subsistence/continuation of the mining lease post 18.7.2016 and till the Said 4.1.2022 Extension Order was received from the State Government, application seeking Review of the Mining Plan after 31.3.2017 was not filed since the lessee would have been questioned as to how the lessee was seeking the Review in the absence of any lease extension order. However, no sooner the lessee received the Said 4.1.2022 Extension Order on 19.1.2022, within less than a week, i.e. on 25/1/2022 the lessee filed for Review of the Mining Plan with utmost despatch.

The review of the earlier approved Mining Plan for the block period 2012-13 to 2016-17 is given below.

5.1.1: Lease Area Utilisation

Sl. No.	Type of land use (in ha)	Area at the beginning of the proposal period	Area proposed under activity	Actual Area utilized in the proposal period	Deviation	Reasons for deviation
1	Mining	2.44	9.5	0	100%	Pending receipt of the permissions, mining was temporarily discontinued.
2	Mineral storage	0	0	0		
3	Mineral Beneficiation plant	0	0	0		
4	Township	0	0	0		
5	Tailing Pond	0	0	0		
6	Railways	0	0	0		
7	Roads	1.0	1.3	0		
8	Infrastructure (Workshop, administrative building etc.)	0	1.0	0		
9	OB/waste dump	2.0	8.0	0		
10	Top soil preservation	0	0	0		
11	Others	0	8.5	0		
12	Total area put to use	5.4	28.3	0		
13	Excavated area reclaimed	0	0	0		
14	Waste dump area reclaimed	0	0	0		
15	Undisturbed Area	64.84	41.98	0		
	Total	70.28	70.28	0		

5.1.2: SDF and CSR Expenditures – Nil

Activity	Proposals		Achievement	Deviation	Reasons for deviation
Total expenditure incurred for implementation of SDF at mine level including - Environment Protection - CSR & other welfare activities in peripheral area *(Explanation: Expenditure is not over and above the statutory levies imposed by the Government; However, THIS EXCLUDES CONTRIBUTION TO DMF & NMET and is over and above the statutory levies imposed by the Government.)*	Nil	Nil	Nil	Nil	-
CSR (Corporate Social Responsibility) spending at the mine level in Proposal Period (as per Companies Act, 2013 or otherwise)	Nil	Nil	Nil	Nil	-

8.2 Technical Details:

8.2.1: Exploration

Particulars	Proposals	Achievement	Deviation	Reasons for deviation
Number of Boreholes/ Pits/ Trenches			100%	Pending receipt of the permissions, mining was temporarily discontinued.
2013-13	5 Boreholes	Nil		
2013-14	7 Boreholes	Nil		
2014-15	8 Boreholes	Nil		
2015-16	7 Boreholes	Nil		
2016-17	7 Boreholes	Nil		
Boreholes Meterage (If Boreholes selected in first row) (m)				
2013-13	250 m	Nil		
2013-14	350 m	Nil		
2014-15	400 m	Nil		
2015-16	350 m	Nil		
2016-17	350 m	Nil		
Grid	100m x 100m 100m x 200m	Nil		
G Axis upgradation during Proposal Period as per guidelines of MEMC Rule 2015)	G1 & G2	Nil		
Area converted under G1 from G2/G3				

8.2.2: Mine Development (Opencast / Dump Mining) –

Iron Ore

Particulars	Proposed		Actual	Deviation	Reasons for deviation
8.2.2.1: Generation of Ore/Waste While Development					
Ore (tonnes)	2012-13	0	Nil	100%	Pending receipt of the permissions, mining was temporarily discontinued
	2013-14	50000			
	2014-15	98000			
	2015-16	302000			
	2016-17	503000			
Waste (tonnes)	2012-13	202000	Nil		
	2013-14	184000			
	2014-15	224000			
	2015-16	2884000			
	2016-17	100000			
Generated Waste while ROM recovery	2012-13	Nil	Nil		
	2013-14	Nil			
	2014-15	Nil			
	2015-16	Nil			
	2016-17	Nil			
Dumping Site (For Surface)	2012-13	W680 – W700 S100 – S180	Nil		
	2013-14	W540 - W650 S140 – S170			
	2014-15	W530 - W600 S140 - S170			
	2015-16	W170 – W510 S170 - S180			
	2016-17	W490 - W540 S170 – S180			
Removal of waste/ over burden in cubic meters	0		Nil		
Generated Waste while ROM recovery	0		Nil		
Dumping site of waste/ overburden	2012-13	W680 – W700 S100 – S180	Nil		
	2013-14	W540 – W650 S140 - S170			
	2014-15	W530 – W600 S140 - S170			
	2015-16	W170 – W510 S170 – S180			
	2016-17	W490 - W540 S170 – S180			

8.2.2.2: Excavation

Lateral extent	2012-13	N170 - N300 E050 – E200	Nil	100%	Pending receipt of the permissions, mining was temporarily discontinued
	2013-14	N030 – N270 E060 - E200			
	2014-15	N100 - N260 W050 – E200			
	2015-16	N100 - N260 W150 – E270			
	2016-17	N080 – N250 W190 - W170			
Vertical extent	2012-13	18 m	Nil		
	2013-14	12 m			
	2014-15	30 m			
	2015-16	30 m			
	2016-17	24 m			

Manganese Ore

Particulars	Proposed		Actual	Deviation	Reasons for deviation
8.2.2.1: Generation of Ore/Waste While Development					
Ore (tonnes)	2012-13	0	Nil	100%	Pending receipt of the permissions, mining was temporarily discontinued.
	2013-14	0			
	2014-15	1000			
	2015-16	3500			
	2016-17	5500			
Waste (tonnes)	2012-13	0	Nil		
	2013-14	0			
	2014-15	14000			
	2015-16	30000			
	2016-17	94000			
Generated Waste while ROM recovery	2012-13	Nil	Nil		
	2013-14	Nil			
	2014-15	Nil			
	2015-16	Nil			
	2016-17	Nil			
Dumping Site (For Surface)	2012-13	Nil	Nil		
	2013-14	Nil			
	2014-15	W530 – W500 S140 – S170			
	2015-16	W170 – W510 S170 – S180			
	2016-17	W490 – W540 S170 – S180			
Removal of waste/ over burden in cubic meters	0		Nil	100%	Pending receipt of the permissions, mining was temporarily discontinued
Generated Waste while ROM recovery	0		Nil		
Dumping site of waste/ overburden	2012-13	Nil	Nil		
	2013-14	Nil			
	2014-15	W530 – W600 S140 – S170			
	2015-16	W170 – W510 S170 – S180			
	2016-17	W490 – W540 S170 – S180			

5.2.2.2: Excavation					
Lateral extent	2012-13	Nil	Nil	100%	Pending receipt of the permissions, mining was temporarily discontinued
	2013-14	Nil			
	2014-15	N430 – N460 W430 – W500			
	2015-16	N450 – N500 W440 – W470			
	2016-17	N480 – N500 W440 – W480			
Vertical extent	2012-13	0	Nil		
	2013-14	0			
	2014-15	3 m			
	2015-16	6 m			
	2016-17	6 m			

5.2.3: Mining operation: Dump Mining – Nil

Particulars	Proposals	Achievement	Deviation	Reasons for deviation
Handling of Material	Nil	Nil	Nil	-
Waste Generated post recovery	Nil	Nil	Nil	-
Dumping site for waste	Nil	Nil	Nil	-

5.2.4: Zero Waste Mining : Nil

Particulars	Proposals	Achievement	Deviation	Reasons for deviation
Alternative use / Disposal of Waste Generated (excluding top soil)	Nil	Nil	Nil	-

5.2.5: Backfilling : Nil

Particulars	Proposals	Achievement	Deviation	Reasons for deviation
Site (Co-ordinates)	Nil	Nil	Nil	-
Area	Nil	Nil	Nil	-
Depth	Nil	Nil	Nil	-
Volume Backfilled (CuM)	Nil	Nil	Nil	-
Backfilled Area available for Reclamation and Rehabilitation	Nil	Nil	Nil	-
Backfilled Area Reclaimed and Rehabilitated	Nil	Nil	Nil	-
Balance Backfilled Area	Nil	Nil	Nil	-

8.2.6: Production of Mineral(s):

Iron Ore

Particulars	Proposals		Achievement	Deviation	Reasons for deviation
8.2.6.1: ROM					
Opencast (Quantity in tonnes)	2012-13	0	Nil	100%	Pending receipt of the permissions, mining was temporarily discontinued.
	2013-14	50000			
	2014-15	98000			
	2015-16	302000			
	2016-17	503000			
8.2.6.2: Cleaned Ore					
Opencast	Nil		Nil	100%	
Dump Mining	Nil		Nil		
Recovery from Mineral Rejects or Tailings	Nil		Nil		
Total (Quantity in tonnes)	2012-13	0	Nil		
	2013-14	50000			
	2014-15	98000			
	2015-16	302000			
	2016-17	503000			

Manganese Ore

Particulars	Proposals		Achievement	Deviation	Reasons for deviation
8.2.6.1: ROM					
Opencast (Quantity in tonnes)	2012-13	0	Nil	100%	Pending receipt of the permissions, mining was temporarily discontinued.
	2013-14	0			
	2014-15	1000			
	2015-16	3500			
	2016-17	5500			
8.2.6.2: Cleaned Ore					
Opencast	Nil		Nil	100%	
Dump Mining	Nil		Nil		
Recovery from Mineral Rejects or Tailings	Nil		Nil		
Total (Quantity in tonnes)	2012-13	0	Nil		
	2013-14	0			
	2014-15	1000			
	2015-16	3500			
	2016-17	5500			

8.2.7: Handling of Mineral Rejects/ Sub-Grade : Nil

Particulars	Proposals	Achievement	Deviation	Reasons for deviation
Generation of mineral rejects				
Opencast	Nil	Nil	Nil	
Dump mining	Nil	Nil	Nil	
Other recovery	Nil	Nil	Nil	
Stacking of mineral rejects/ sub-grade mineral	Nil	Nil	Nil	-
Blending of mineral reject / sub-grade	Nil	Nil	Nil	-

8.2.8: Environment Compliances

Particulars	Proposals		Achievement	Deviation	Reasons for deviation
8.2.8.1: Top soil					
Generation	Nil		Nil	Nil	-
Utilization	Nil		Nil	Nil	-
Stacking (Dump Id)	Nil		Nil	Nil	-
Reclamation	Nil		Nil	Nil	-
Rehabilitation	Nil		Nil	Nil	-
8.2.8.2: Afforestation (Dumps/Benches/Backfilled Area etc.)					
2012 - 13	Nil		Nil	Nil	-
2013 - 14	Nil		Nil	Nil	-
2014 - 15	Nil		Nil	Nil	-
2015 - 16	Nil		Nil	Nil	-
2016 - 17	Nil		Nil	Nil	-
8.2.8.3: Afforestation (Green Belt)					
2012 - 13	1.75 Ha.		Nil	100%	Pending receipt of the permissions, mining was temporarily discontinued.
2013 - 14	1.00 Ha.		Nil		
2014 - 15	1.50 Ha		Nil		
2015 - 16	1.75 Ha.		Nil		
2016 - 17	2.50 Ha.		Nil		
Construction of check dams	Settling Pond – 1 No.		Nil		
Construction of garland drains	2012 - 13	250 m	Nil		
	2013 - 14	150 m			
	2014 - 15	120 m			
	2015 - 16	100 m			
	2016 - 17	100 m			

Construction of retaining walls	2012 - 13	250 m	Nil		
	2013 - 14	150 m			
	2014 - 15	100 m			
	2015 - 16	100 m			
	2016 - 17	100 m			
8.2.8.4: Tailings					
Generation	Nil		Nil	Nil	-
Utilization (Auto fill from production)	Nil		Nil	Nil	-
Disposal	Nil		Nil	Nil	-

8.3: Socio-Economic Review

8.3.1: Rehabilitation & Resettlement for Project Affected People					
Particulars	Proposals		Actual	Deviation	Reasons for deviation
No. of Project Affected People (PAP)	Nil		Nil	Nil	-
%age of PAP for whom alternate arrangements made for sustained livelihood	Nil		Nil	Nil	-
% of project affected families given employment	Nil		Nil	Nil	-
% of project affected families who have been skilled by the lessee and absorbed (% of total employment given to affected families)	Nil		Nil	Nil	-
8.3.2: Grievance Redressal					
Grievances Received	Nil	Nil	Nil	Nil	-
Grievances Redressed	Nil	Nil	Nil	Nil	-

8.3.3: Welfare and socio-economic development programs for local communities

8.3.3.1: Support for Drinking Water & Agriculture					
	2012-13	2013-14	2014-15	2015-16	2016-17
No. of Water Storage Tanks constructed	Nil	Nil	Nil	Nil	Nil
Drinking Water Facilities provided (Bore wells/ Pumps etc.)	Nil	Nil	Nil	Nil	Nil
Irrigation Support provided (Canals/ Pumps etc.)	Nil	Nil	Nil	Nil	Nil
No. of Water tanks De-silted	Nil	Nil	Nil	Nil	Nil
Water Treatment facilities provided (A/NA)	Nil	Nil	Nil	Nil	Nil
Amount of Water treated (in kl.) (if selected A in above)	Nil	Nil	Nil	Nil	Nil
8.3.3.2: Support to Health & Medical Services					
No. of persons identified from Occupational health diseases	Nil	Nil	Nil	Nil	Nil
No. of Health Camps/ Medicine Camps Organized	Nil	Nil	Nil	Nil	Nil
8.3.3.3: Support to Skill development & Education					
Vocational Training Provided/ Support Provided					
No. of employees undergone Vocational training	Nil	Nil	Nil	Nil	Nil
No. of other persons undergone Vocational training	Nil	Nil	Nil	Nil	Nil
Number of Literacy & Education Camps held/ Supported	Nil	Nil	Nil	Nil	Nil

8.3.3.4: Support to Transportation Services & Infrastructure					
	2012-13	2013-14	2014-15	2015-16	2016-17
Expenditure on Transportation Services & Infrastructure	Nil	Nil	Nil	Nil	Nil
Road development (m) in the peripheral area (not lease area)	Nil	Nil	Nil	Nil	Nil
No. of Public transport support provided (Ambulance/Buses/ School Vans etc)	Nil	Nil	Nil	Nil	Nil
8.3.3.5: Swatchata Programs: Creating/providing sanitation and healthy condition in and around the mine area					
Adoption of ODF within mining lease area					
No. of Toilets built in the Lease Area	Nil	Nil	Nil	Nil	Nil
Adoption of ODF in nearby villages					
No. Of Toilets built in the villages	Nil	Nil	Nil	Nil	Nil
Provision for greenage recreational facility (Within Lease Area/ Outside)					
Recreational Area Type (Picnic Spot/ tanks/Park Etc)	Nil	Nil	Nil	Nil	Nil
Area covered (For within Lease Area only)	Nil	Nil	Nil	Nil	Nil
Awareness program among Mine workers for Swatchata					
No. of Swatchchta Programmes held	Nil	Nil	Nil	Nil	Nil

Chapter 9 : IMPACT ASSESSMENT

(for fresh grant)

9.1: Baseline Information

Whether Area falls under Forest	Yes
Whether Area falls under Wildlife Sanctuary	No
Whether Area falls under Coastal Regulation Zone (CRZ)	No
Whether Area falls under Defence Land	No
Any Other Clearance (specify)	Environmental Clearance (EC)

Any Significant Objections from any Agency Involved in Stakeholder's Consultation - Nil

9.2: Environment Parameters-

Air environment: Parameters mentioned Schedule VII of the Environment (Protection) Act 1986 under the National Ambient Air Quality Standards will be monitored.

Water Environment: Parameters mentioned in the Schedule VI of the Environment (Protection) Act 1956 under the standards for the discharge of environmental standards will be monitored.

Noise environment: parameters as mentioned under the Schedule III of the Environment (Protection) Act 1986 will be monitored.

9.2.1: Environment Monitoring

Monitoring Activity

To know the influence of the mining activity on the surrounds, environmental monitoring activity with respect to the Air Environment, water environment and noise environment will be carried out. The monitoring frequency will be carried out as mentioned in the sections below.

9.2.1.1: Ambient Air Quality-

Core Zone (Quarterly Monitoring Planned)	Air monitoring at four locations is planned to be carried out in core zone at a frequency of two times in a week (24 readings in a quarter)
Buffer Zone (Quarterly Monitoring Planned)	Air Monitoring at four locations is planned to be carried out in buffer zone at a frequency of two times in a week (24 readings in a quarter)

9.2.1.2: Water Quality-

Core Zone (Quarterly Monitoring Planned)	Water Monitoring is planned to be carried out at locations where water is discharged from the Mining Lease at a frequency of one time in a month (3 readings in a quarter)
Buffer Zone (Quarterly Monitoring Planned)	Water Monitoring is planned to be carried out at the nearest water bodies and in the upstream and downstream of the nearest flowing water bodies at a frequency of one time in a month (3 readings in a quarter)

9.2.1.3: Noise Level-

Core Zone (Quarterly Monitoring Planned)	Noise level monitoring at four locations is planned to be carried out in core zone at a frequency of one time in a season (1 readings in a quarter)
Buffer Zone (Quarterly Monitoring Planned)	Noise level monitoring at four locations is planned to be carried out in core zone at a frequency of one time in a season (1 readings in a quarter)

9.3: Impact Assessment

9.3.2: Land Environment :

9.3.2.1: Base / Present Status	
Pre Mining Use	AREA (Ha)
Barren / Waste land with small bushes & shrubs	Nil
Land under Agriculture / Crops	Nil
Land covered with Plants	Nil
Land under Grass Cover	Nil
Land under Public Infrastructure / Utilities (water bodies, roads, railways, electric lines, telephone lines etc.)	Nil
Land under Habitation	Nil
Land under Monuments & places of Historical Importance	Nil
Degraded by Pits & Excavation	2.44
Degraded by Dumps & Material Stacking	0.605
Covered under Mine Infrastructure (plants, shades, buildings etc.)	Nil
Land under Forest	70.20
Historically, Culturally & Ecologically Important Places	Nil
Any Other, please specify below	Nil
Date of Observation	01-01-2022

9.3.2.2: Anticipated Impact	
Post Mining Use	AREA (Ha)
Degradation by Excavation	19.6031
Degradation by Dumps & Material Stacking	13.2405
Covered under Plants, Shades & Buildings	0.0531
Covered by Roads & Approaches	0.3782
Any Other, please specify below Safety Zone	3.1593

9.3.2.3: Mitigation Measures

9.3.2.3.1: Backfilling

There is no proposal for backfilling within the Mining Lease during the plan period.

9.3.2.3.2: Area proposed to be covered by Plantation in Backfilled Area

Not applicable as there is no proposal for backfilling within the Mining Lease during the plan period.

9.3.2.3.3: Proposed Area under Agriculture

There is no proposal to raise agriculture patch within the Mining Lease.

9.3.2.3.4: Proposed Area to be converted to Grazing Land

There is no proposal to raise grazing land patch within the Mining Lease

9.3.2.3.5. Ground Water Recharging

Rainwater from broken-up area will be channelized to the mine pit during monsoon season. Mining pit developed during mining operations will be utilized as a major ground water recharging site.

9.3.2.3.6: Green Belt Development *

1. Safety zone of 7.5 m width will be maintained all along the periphery of the Mining Lease, which would be of about 3.1593 Ha.
2. Green belt development will be initiated on the dumps, which will be generated from the third year of commencement of the mining operation.

9.3.2.3.7: Agriculture *

Development of agriculture is not proposed within the mining lease during the mining operation.

9.3.3: Air Environment

9.3.3.1: Climate & Meteorology (Please provide average of 10 years)

Temperature (°C)		Relative Humidity (%)	Average Rainfall (mm)
Maximum	Minimum	60-90%	1000mm
35°C	17°C		

9.3.3.2: Air Quality Details for Base line Information / Present Status

Sr. No.	Station Name	Season	PM10 (µg/m3)	PM10 Excess (µg/m3)2	PM2.5 (µg/m3)	PM2.5 Excess (µg/m3)2	SO_2 Value (µg/m3)	SO_2 Excess (µg/m3)	NO_x Value (µg/m3)	NO_x Excess (µg/m3)	Date of Observation	Action
1	Mallikarjun Temple	Post Monsoon	36.6		20.2	-	7.4	-	7.2	-	Dec - 2020	-
2	Kavarem Village	Post Monsoon	44.7	-	23.2	-	9.9	-	13.4	-	Dec - 2020	-
3	Shinshore village	Post Monsoon	43.7	-	22.9	-	9.5	-	11.1	-	Dec - 2020	-
4	Mana Village	Post Monsoon	42.1	-	22.8		9.2	-	11.1	-	Dec - 2020	-
5	Khadde village	Post Monsoon	49.8	-	25.9	-	9.2	-	12.2	-	Dec - 2020	-
6	Bendade Village	Post Monsoon	44.7	-	23.5	-	9.9	-	11.9	-	Dec - 2020	-
7	Revona Village	Post Monsoon	44.8	-	24.5	-	9.2	-	11.1	-	Dec - 2020	-
8	Pala Village	Post Monsoon	38.5	-	22.4	-	8.9	-	11.5	-	Dec - 2020	-

4.3.3: Impact Assessment & Mitigation Measures

4.3.3.1: Anticipated Impact *(Give details on Prediction of fugitive dust emissions due to mining activities, crushing & cleaning plants, loading & unloading, transportation by rail, road or conveyer)*

Although the Mining Lease area is 70.20 Ha., the mining operation will be carried out only in an area of 28.1765 Ha., during the first five year plan period. Further, the mining operation will involve ground preparation such as ripping of hard laterite terrain by Ripper-Dozer and excavation will be carried out by Excavators. Loading of the ROM (Iron Ore) and waste in the dumpers will be carried out by Shovels and excavators. The dumpers will transport the ore and waste by road within the Mining Lease to a predetermined stacking area. Some portion of ROM (Iron Ore) will also be transported to the Screening and crushing plants which will bring about size separation as lumps and fines. Finished products such as lumps and fines as well as the ROM (Iron Ore) also will be sold to prospective buyers wherein the buyers transport ore by road to the nearest Jetty. The above-mentioned mining activities that will be carried out to win the Iron Ore will generate fugitive dust.

4.3.3.2: Mitigation Measure **Give details on measures to reduce the emissions of pollutants during mining, loading, unloading, transportation, drilling, blasting, crushing etc. to maintain the air quality**

Taking into consideration the major sources of dust generation, the following measures will be undertaken during the mining operations & will be continued until the conceptual period in order to control fugitive dust :-

1) Water sprinkling on active working benches & also the transport haul roads.
2) Development of green belt along the roads, on the inactive waste dumps, around the building & around the ultimate pit limit
3) Tippers / Dumpers carrying ore from mine to jetty points will be covered with tarpaulin which help avoid the dust from getting airborne.
4) Avoid overloading of trucks thereby preventing the spillage of ore on the transport route.
5) Regular ambient air quality monitoring will be carried out and the measures will be taken so as to conform to the norms laid down by CPCB.
6) Regular maintenance of machineries.
7) Vehicular emissions are kept under control by carrying out regular monitoring.
8) Trucks and vehicles used for transportation of ore are engaged only after having the valid 'Pollution Under Control' certificate and having necessary permits under Central Motor Rule, 1989 and its further amendments.

3.4: Water Environment

3.4.1: Rain Water

3.4.1.1: Base / Present Status (Details of Rivers, Springs, Lakes, Reservoirs & Drains up to First Order in Study Area)

The Mining Lease is located on a hilly undulating terrain. Due to the hilly topography, first order drains are observed flowing from the mountain peak downwards. Altogether, six first order drains are observed. Two first order drains are on the northern side of the lease, one on the North-East side, two on the southern side and one on the South Eastern side of the lease. Water reservoirs within the buffer zone include a) Karka Nallah at a distance of about 2 Km from the Mining Lease, b) Tributary to Karka nallah flows on the Northern side of the Mining Lease. During monsoon, in the unbroken lease area, rainwater gets drained from the above mentioned first order drains.

3.3.4.1.2: Anticipated Impact (Impact on Surface Water Bodies / Groundwater Table Regime / Streams / Lake / Springs due to Mining, to be Assessed from Hydro-geological Study Give details about impact on vegetation)

There is no surface water bodies within the lease. During the course of mining, land topography will change. Detailed Hydrological studies will be carried out.

3.3.4.1.3: Mitigation Measure (Possibilities of Rain Water Harvesting & Artificial Recharge with in the Mining Lease)

The surface and ground water quality will be regularly monitored. Important parameters which influence the water quality are suspended solids and Dissolved solids, generated due to wash off from the dumps, erosion, run-off from mine workings & roads which mainly depends on mining activities, topography & rainfall in the area. In the monsoon season, most of the mining activities are stopped which reduces run-off of sediments from the dumps & mining roads, as they remain undisturbed due to non-activity. Monsoon preparation will involve provision of garland drains at the toe of the benches of the dumps as well as of the mine. Retention wall will be provided at the toe of the dump. Settling ponds will be provided at strategic locations so as to collect the sediment runoff. The above mentioned measures will be undertaken to help prevent the movement of sediment runoff out of the Mining lease from during monsoon.

Rainwater from the face of the mine and dumps will be diverted to the mine pit where sufficient settling time for the sediment runoff. Part of accumulated pit water will be utilized during the fair season for dust suppression, green belt development & other miscellaneous activities requiring water.

The above-mentioned mitigating measures will be undertaken to allow the discharged of clean water from the Mining Lease. All attempts will be made so as to conform the parameters of discharged water to the standards as prescribed in the Environment (Protection) Act 1986 (general standards for discharging into natural water body).

Thus, there will not be any negative impact of the water drained from the Mining Lease on quality of the water bodies present in proximity of the Mining Lease

9.3.4.2: Water Body

9.3.4.2.1: Base / Present Status* (Water Bodies Existing & Water Bodies likely to be created due to Mining Activities & their Water Holding Capacity)

Water bodies do not exist in the Mining Lease. Mining Operations will lead to formation of a void which will store rain water during monsoon season

9.3.4.2.2: Anticipated Impact (Ingress of Sea Water, Particularly for Mining Projects in Coastal Areas)

Not Applicable as the proposed Mining Lease is about 12.5km away from coastal areas and is located at an elevation between approximately 310m to 150m AMSL.

9.3.4.2.3: Mitigation Measure (Steps to Minimize Impact on Water Table if Mining Intercepts Groundwater Regime)

During the plan period (2022-23 to 2026-27) mining operations will be carried out above the Ground water table, hence no impact on the water table.

9.3.4.3: Water Balance

9.3.4.3.1: Base / Present Status (Water Balance (Withdrawal of Surface Water & Release of Mine Drainage Water) Water Requirement & Waste Water Generation from various Activities of Mine, Including Beneficiation)

Surface water bodies do not exist within the Mining Lease..

The mining operations will require approximately 135 m3/d for activities such as Dust suppression - 100m3/d, Green belt- 10m3/d, Domestic - 5m3/d, workshop – 10m3/d, wheel washing system - 10m3/d

During the first plan period, the water accumulated in the mine pit will be utilized for the mentioned activities, however, any shortcoming to meet the required quantity will be procured from nearby surface water bodies through local contractors.

During the first five years of plan period (2022-23 to 2026-27), no waste water will generated as the entire ROM (Iron Ore) will be subjected to dry processing and not to wet beneficiation

9.3.4.3.2: Anticipated Impact (Impact of Water Drawl on Surface & Groundwater Resources Impact on Surface & Groundwater Quality due to Discharges from Mining, Tailings Pond, Workshop, Township, & Leachate from Solid Waste Dumps etc)

There are no surface water bodies within the Mining Lease. During the plan period, mining operations will be above the groundwater table. Hence, no impact of water drawl on surface water. During monsoon, the mine pit will act as a reservoir which will harvest and collect rain water and the same will help recharge the ground water.

9.3.4.3.3: Mitigation Measure (Construction of Check Dams, Sedimentation Ponds, Settling Tanks, Retaining Walls etc. with Design & Site Features for Control of run-off Mine Water Treatment for Meeting the Prescribed Standard Waste Water Treatment for Township Sewage, Workshop(s), Tailing Pond Overflow etc)

The important parameter which influence the water quality are Suspended solids and dissolved solids generated due to wash off from the dumps, silt erosion, run-off from mine working areas & roads. The extent of the silt runoff in the rainwater during monsoon mainly depends on mining activities, topography & rainfall in the area.

During monsoon season, mining operations temporarily suspended thereby reducing the sediment run-off of from the dumps plots & mining roads. Monsoon preparation will involve provision of garland drains at the toe of the benches of the dumps as well as of the mine. Retention wall will be provided at the toe of the dump. Series of settling ponds will provided at strategic locations so as to collect the sediments from the runoff. The above mentioned measures will be undertaken to help prevent the movement of sediments out of the Mining lease during monsoon.

Further, rainwater from the face of the mine and dumps will be diverted to the mine pit where sufficient settling time will be available for the sediment runoff. Accumulated pit water will be utilized during the fair season for dust suppression, green belt development & other miscellaneous activities requiring water. Surface and ground water quality will be regularly monitored.

Rainwater runoff generated during the monsoon season will be diverted to the mine pit as well as the settling ponds located at strategic locations. Rainwater harvested in the mine pit will percolate to the ground thereby recharging the ground water and part of the water will be reused for the mining activities mentioned above. Water loss will be observed due to evaporation and balance water if any will be pumped out of the mine lease into the nearby fields after treatment.

The above mentioned mitigating measures will be undertaken and clean water will be discharged from the Mining Lease. All attempts will be made so as to conform the parameters of discharged water to the standards as prescribed in the Environment (Protection) Act 1986 (general standards for discharging into natural water body).

The monitoring locations are shown on Environment Plan, **Plate No. 11**. Monitoring reports showing the ambient air quality are attached as **Annexure No. 15**.

9.3.5: Noise

9.3.5.1: Critical Locations Identified within Lease Area *

The major critical locations which will generate noise pollution during the mining operations within the mining Lease will include excavation area, loading and unloading area, screening and crushing plant area and the haul roads.

9.3.5.2: Give Detail about Prediction of Noise Level by using Mathematical Modelling at Different Locations Identified *

Prediction of Noise Level by using Mathematical Modeling will be carried out before commencing the mining operations.

9.3.5.3: Measures to Minimize the Impact on Receiving Environment *

All the measures as explained and laid down as per ILO guidelines in DGMS technical circular 18 of 1975 will be undertaken to maintain the noise level below 85 dBA, in the work environment. In order to keep noise pollution under control, state of the art heavy earth moving machinery (HEMM) which complies with Euro emission norms tier II and III will be engaged. These HEMM have ergonomically designed air conditioned cabins and generate less noise levels within the cabins, which are well below the permissible limits. Only those transportation trucks will be used which are in good condition and is well maintained. Mining operations are carried out during day-time only. Noise levels are monitored in the core and buffer zone regularly during day and night time when the mines are being operated. The workers engaged on the surface are provided with ear plugs/muffs. The 7.5 m safety zone maintained at the periphery of the mining lease will also act as a noise barrier.

9.3.5.4: Noise Details for Base / Present Status

Noise Standards			
Area Code	Category of Area	Limits in dB(A)Leq	
		Day Time	Night Time
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Area	50	40

Sl. No.	Station Name	Season	Type of Area	Noise At Day Time	Excess Noise At Day	Noise At Night Time	Excess Noise at Night	Date of Observation
1	Core Zone ML Area	Post Monsoon	Industrial	48.6	-	39.9	-	Nov 2020
2	Kavarem Village	Post Monsoon	Residential	46.1	-	36.9	-	Nov 2020
3	Shanshore village	Post Monsoon	Residential	46.7	-	40.9	-	Nov 2020
4	Maina Village	Post Monsoon	Residential	44.7	-	35.6	-	Nov 2020
5	Khadde village	Post Monsoon	Residential	45.7	-	40.2	-	Nov 2020
6	Bendode Village	Post Monsoon	Residential	47.8	-	38.9	-	Nov 2020
7	Revona Village	Post Monsoon	Residential	49.1	-	37.7	-	Nov 2020
8	Pirla Village	Post Monsoon	Residential	46.3	-	37.7	-	Nov 2020

9.3.5.5: Impact Assessment & Mitigation Measures

9.3.5.5.1: Anticipated Impact (Give details on impact on ambient noise level due to rock excavation, transportation, processing equipment's & ancillaries)

The mining operation will be carried out by open cast mining method & it will be fully mechanized. The process will involve ripping of hard ground by ripper & dozer and by avoiding conventional drilling and blasting operations. Excavators and shovels will then load the Iron Ore and waste into dumpers. Dumpers will transport ROM (Iron Ore) and waste and from the site of excavation to their respective stacking area. Some portion of ROM (Iron ore) will be transported to mobile screening/crushing plant. As per market demand, ROM (Iron ore) will be directly sold or further processed through crushing and screening to produce finished product in the form of lumps and fines.

Noise will be generated during ground preparation wherein the hard rock surface will be ripped by ripper-dozer, further the boulders will be broken by the rock breaker producing the loose material which will be made accessible for its transport. Excavation is carried out by excavators and the loose soil will be loaded into the transport dumpers. The assemblage of the excavator/shovel and the dumpers will be a source of noise pollution which may be attributed to an area source. Point source noise pollution may also be attributed to the crushing and screening plants involved in ore processing activity. The line source noise pollution will be mainly due to the haulage of ore by the tipper trucks/dumpers.

9.3.5.5.2: Mitigation Measure (Give details on measures for noise abatement including point source & line source)

In order to keep noise pollution under control, state of the art heavy earth moving machinery (HEMM) which comply with Euro emission norms for II and III will be engaged. These HEMM have ergonomically designed air conditioned cabins and generate less noise levels within the cabins, which are well below the permissible limits. Transportation tippers which are in good condition and are well maintained will be engaged.

The workers and supervisors engaged on the field will be provided with ear-plugs. Mining operations are carried out during day-time only.

Noise levels will be monitored in the core and buffer zone regularly during day and night time when the mines are being operated.

The 7.5 m safety zone maintained at the periphery of the mining lease will also act as a noise barrier.

9.3.6: Vibration

9.3.6.1: Vibration Details for Base / Present Status

The top layer is laterite & Lateritic lumpy Iron ore with about 5 to 12 meters thickness. The hard and compact lateritic formation is loosened by ripping engaging Ripper - Dozer. The proposed project does not envisage any blasting activity during its operation

S.no	Station	Season	Distance from Blasting Site(m)	Peak Particle Velocity(mm/sec)	Air over Pressure(DB)	Frequency (Hz)	Date of Observation
–	–	–	–	–	–	–	–

9.3.6.2.1: Anticipated Impact (Give details on impact of vibrations including damage to materials/structures due to blasting)

As there is no proposal of blasting activities within the Mining Lease, vibration will not be generated.

9.3.6.2.2: Mitigation Measure (Give details on measures for noise abatement including point source & line source)

Not applicable as blasting activities will not be carried out within the Mining Lease

9.3.7: Socio-Economic Environment

9.3.7.1: Demographic Profile

There are 27 villages and one town in buffer zone of 10km located in South Goa district. And the total population is 129784.

Sl. No.	Type of Area	Name of Village	Total Population	Male to Female Ratio	Literacy Rate (%)	Employment Rate (%)
1	Quepem	Non Schedule	87193	994	74.35	71.08
2	Sirvoi	Non Schedule	1229	1020	73.69	73.69
3	Zanodem	Non Schedule	272	971	69.12	47.06
4	Undorna	Non Schedule	176	892	51.70	67.05
5	Molcopona	Non Schedule	457	1040	70.90	66.74
6	Molcarnem	Non Schedule	1507	1132	75.71	73.52
7	Adnem	Non Schedule	1657	973	73.09	83.46
8	Pali	Non Schedule	2944	1019	77.38	72.01
9	Fatorpa	Non Schedule	2378	1144	73.00	61.65
10	Ambaulim	Non Schedule	2967	1087	65.65	64.31
11	Cavorem	Non Schedule	920	893	71.41	99.67
12	Mana	Non Schedule	505	588	77.62	129.51
13	Padi	Non Schedule	268	811	60.45	90.67
14	Quedem	Non Schedule	474	953	69.81	69.32
15	Barcem	Non Schedule	2685	910	60.71	72.59
16	Cocoldem	Non Schedule	579	856	60.28	85.49
17	Quisconda	Non Schedule	491	867	67.21	112.42
18	Pirla	Non Schedule	474	888	71.31	106.12
19	Sulcorna	Non Schedule	594	673	78.62	107.24
20	Corla	Non Schedule	209	786	49.76	79.43
21	Cazur	Non Schedule	510	841	65.69	86.08
22	Colomba	Non Schedule	1831	929	71.82	82.96
23	Rivona	Non Schedule	3621	995	75.39	74.10
24	Curpem	Non Schedule	886	783	76.19	85.33
25	Morpila	Non Schedule	2657	930	67.34	85.12
26	Cordem	Non Schedule	1617	900	67.84	87.20
27	Cuncolim (M Cl) Urban	Non Schedule	16623	1098	82.19	61.93

9.3.7.1.1: Anticipated Impact (Give details about impact on the cropping pattern & crop productivity in the core zone)

Entire Mining lease area is forest land. There are no crops produced in the core zone.

9.3.7.1.2: Mitigation Measure (Give details about compensation for loss of land & crops)

Not applicable as the entire Mining Lease area is forest land and there are no crops produced in the core zone. Forest land compensation will be done as per the provisions of Forest Conservation Act 1980.

9.3.7.2: Traditional Skills & Source of Livelihood

9.3.7.2.1: Base / Present Status (Give details about present status on traditional skills & source of livelihood)

Agriculture and mining are the major source of livelihood.

9.3.7.2.2: Anticipated Impact (Give details about positive & negative impacts on present status of livelihood in the area)

With the commencement of operation of the proposed mine, the project will have a positive impact on the livelihood in the area.

9.3.7.2.3: Mitigation Measure (Give details about training to locals for employment in the project training for making them self-employable or elsewhere)

The project will also extend facilities such as schooling, improvement in the health status of villages by establishing health care units, & health camps in the nearby villages, improvement in infrastructure by carrying out repair & maintenance of village roads, etc. Training facilities will be extended to the villagers absorbed in the project

9.3.7.3: Economic Profile of the Population in Core & Buffer Zone

9.3.7.3.1: Base / Present Status (Give details about economic profile of the population in core & buffer zone)

There are no human settlement in the Core Zone.

Buffer zone comprises of two talukas, viz. Quepem and Sanguem taluka. Details regarding the economic profile for the two talukas as per the survey report, 2022, published by Space Based Information Support for Decentralised Planning (SISDP), Hyderabad, Economic activity wise population details for Quepem and Sanguem taluka is given below:

Economic activity wise population details, Quepem Taluka

S. No.	Category	Total	Male	Female
1	Cultivators	3684	2448	1236
2	Agriculture labourers	4289	2002	2287
3	Household industries	708	426	282
4	Other	24209	17712	6497
5	**Total**	32890	22588	10302

Economic activity wise population details, Sanguem Taluka

S. No.	Category	Total	Male	Female
1	Cultivators	2658	1593	1065
2	Agriculture labourers	3530	1696	1835
3	Household industries	568	379	189
4	Other	20525	15563	4962
5	**Total**	**27281**	**19230**	**8051**

9.3.7.3.2: Anticipated Impact (Give details about impact on community resources such as grazing land)

Entire Mining Lease falls in the forest land. A part of the lease area will be broken for the mining and allied activities.

9.3.7.3.3: **Mitigation Measure (Give details about employment opportunities & access to other amenities such as education, health care facilities to be extended to locals, addressing local unemployment, tourism or recreation opportunities, efforts for sustainable development of the local community)**

The project will provide employment to the people living in the nearby villages. However, based on the requirement of skill level and availability of the resources, employment will be provided to people from other surrounding villages.

The project will also extend facilities such as schooling, provide water whenever needed, improvement in the health status of villages by establishing health care units, & health camps in the nearby villages, improvement in infrastructure by carrying out repair & maintenance of village roads, etc. Training facilities will be extended to the villagers absorbed in the project.

9.3.7.4: Human Settlement In Core & Buffer Zone

9.3.7.4.1: **Base / Present Status*(Give details about human settlement in core & buffer zone)**

There are no human settlement in the Core Zone.

Human settlement within the buffer zone is sparse and distantly distributed. Around 250 houses exists within a radius of 1.5 Km and most of them are on the northern side of the Mining Lease. The closest human settlement of around 50 houses is at a distance of 250m from the northern boundary of the Mining Lease.

9.3.7.4.2: **Anticipated Impact *(Give details about any displacement of human settlements during the life of the mine)**

No applicable as there are no human settlement in the Core Zone.

9.3.7.4.3: **Mitigation Measure *(Give details about rehabilitation & resettlement of land owners & displaced people)**

No applicable as there are no human settlement in the Core Zone.

9.3.7.5: **Health Profile of Population in Core & Buffer Zone**

9.3.7.5.1: **Base / Present Status*(Give details about health profile of population in core & buffer zone)**

There are no human settlement in the Core Zone.

As per survey in 2021, the maximum no. of health cases registered at the nearby health center at Quepem was due to cough and cold (with or without fever) comprising of about 47%, followed by gastroenteritis and dysentery cases with 15.9%, accident cases at 11.9%, Influenza at 6%, Asthma and bronchitis at 4.6%. The remaining included cases related to diabetes, blood pressure, skin diseases, ENT and eye diseases).

9.3.7.5.2: **Anticipated Impact *(Give details about any adverse impact on the general health condition of the population in core & buffer zone)**

There are no human settlement in the Core Zone

Mining activity will not have any adverse impact on the general health condition of the population in the buffer zone.

9.3.7.5.3: **Mitigation Measure *(Give details about avenues like dispensaries, hospitals, maternity homes if any to be created)**

Health benefits to the public in the form of clinics along with ambulance in service will be provided to the general public within the nearby villages around the mining lease.

9.3.7.6: **Historically, Culturally & Ecologically Important Places in Core & Buffer Zone.**

9.3.7.6.1: **Base / Present Status*(Give details about historically, culturally & ecologically important places in core & buffer zone)**

There are no historically, culturally & ecologically important places in core

In the buffer zone Mallikarjun Temple exists at a distance of 360m from the northern side of the mining lease boundary. Bhagwan Mahavir and Netravali Wildlife Sanctuary is at a distance of 11.8 and 11.7 Kjm respectively.

9.3.7.6.2: Anticipated Impact *(Give details about risk profiling)

Mining activity will not have any adverse impact on the historically, culturally & ecologically important Places.

9.3.7.6.3: Mitigation Measure *(Give details about public health benefits (e.g. clean water to an aboriginal community), measure for safeguard against damage etc.)

The project will provide employment to the people living in the nearby villages. However, based on the requirement of skill level and availability of the resources, employment will be provided to people from other surrounding villages.

The project will also extend facilities such as schooling, improvement in the health status of villages by establishing health care units, & health camps in the nearby villages, provide water whenever needed, improvement in infrastructure by carrying out repair & maintenance of village roads, etc. Training facilities will be extended to the villagers absorbed in the project

Fernandes
(Rachel Fernandes)
Qualified Person

Mining Plan / Review & Updation of Mining Plan is approved subject to conditions laid down in Letter No. IBM/MRCW-65/GOA/2021-22 Dt. 14.03.2022

14.03.22

उप खान नियंत्रक एवं कार्यालय प्रभारी
Deputy Controller of Mines & Officer In-Charge
भारतीय खान ब्यूरो, मडगांव
Indian Bureau Of Mines, Madgaon

CONSENT LETTER / UNDERTAKING / CERTIFICATE FROM THE LESSEE

01 The Review & Updation of Mining Plan in respect of Zamblidadga Dongor Iron and Manganese Ore Mine, M.L. No. 3/FeMn/79 over an area of 70.2 Ha in Cavrem Village, Quepem Taluka, South Goa District, Goa State, under Rule 17 of MCR, 2016 has been prepared by Qualified Persons, Mrs. Roshel Fernandes.

This is to request the Regional Controller of Mines, Indian Bureau of Mines, Margao Goa, to make any further correspondence regarding any correction in the Review & Updation of Mining Plan with the said qualified persons at address below:

1) Name : Mrs. Roshel Fernandes
Address : H. No. 323/85,
Opp. Shetye Salkar Residency,
Faturda, Margao
Salcete-Goa- 403 723
Email : roshel.fernandes05@gmail.com
Mobile No. : +91 9049800828

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

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

03 It is certified that Progressive Mine Closure Plan of Zamblidadga Dongor Iron and Manganese Ore Mine, M.L. No. 3/FeMn/79 of Shri Naraina Sinai Quirtanim over an area of 70.2 Ha, complies with all statutory rules, regulations, order 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 concern authorities.

The information furnished in the Progressive Mine Closure Plan is true and correct to the best of our knowledge and records.

04 The provisions of Mines Act, Rules and Regulations made there under have been observed in the Review & Updation of Mining Plan over an area of 70.20 ha in South Goa district in Goa state belonging to Zamblidadga Dongor Iron and Manganese Ore Mine, M.L. No. 3/FeMn/79 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 miner's health will be strictly implemented.

Place: Margao

Date: 01-03-2022

Pradnya Zoivant Pai Cano

(Pradnya Zoivant Pai Cano)

For self and on behalf of all other heirs of Late Shri Naraina Sinai Quirtonim as their duly constituted attorney

CERTIFICATE FROM QUALIFIED PERSON

1) The provision of the Mineral Conservation and Development Rules 2017 have been observed in the preparation of the Review & Updation of Mining Plan for Zamblidadga Dongor Iron and Manganese Ore Mine, M.L. No. 3/IeMn/79 over an area of 70.2 Ha, of Shri Naraina Sinai Quirtanim (Late), in Cavrem village, Quepem Taluka, South Goa District of Goa State and whenever specific permissions are required, the applicant will approach the concerned authorities of Indian Bureau of Mines.

The information furnished in the Review & Updation of Mining Plan is true and correct to the best of my knowledge.

2) All plans and sections are prepared based on Geo-referenced Cadastral DGPS Plan duly authenticated by the Directorate of Mines & Geology, Government of Goa.

Place: Margao

Date: 01-03-2022

ROSHEL MARIA FERNANDES

(Roshel Fernandes)

Qualified Person

LIST OF ANNEXURES

Regd A.D.

Government of Goa
Directorate of Mines & Geology
Institute Menezes Braganza, Panaji-Goa

Website:goadmg.gov.in **e-mail:dir-mine.goa@nic.in**

No.: 96/51/99-Mines /1840 **Dated:** 04/01/2022

To,
Smt. Pradnya Zoivant Poi Cano,
For self and on behalf of all other heirs of
Late Shri Naraina Sinai Quirtonim as
Their duly constituted attorney,
Mathura, H. No. 1153, Near Apna Bazar,
Aquem, Alto, Margao, Goa 403 601.

ORDER

Deemed grant of Lease Bearing No. 3/FeMn/79 in terms of Sub-Section (3) to Section 8A of MMDR Act, 1957 r/w Sub-Section (6) to Section 8A of MMDR Amendment Act, 2015.

Whereas, the Lease Bearing No. 3/FeMn/79 as mentioned above was granted to Shri Naraina Sinai Quirtonim for the period of 20 years from the date of execution of lease deed on 13/12/1979 for Iron and Manganese Ore situated in Caurem Village, of Quepem Taluka, South Goa for an area of 70.28 Ha.

And whereas, being one of the legal heir, Smt. Kala N. S Quirtonim filed Form J- Application for renewal dated 10/12/1998 within the prescribed time limit as per the applicable rules on behalf of self and as Power of attorney holder for her children Priya Kirtany & Pradnya Kirtany for a period of 20 years for the whole lease area.

1

And whereas, in terms of said provision of Sub-Rule (1) to Rule 24(A) of MCR 1960, such applications were required to be filed one year prior to expiry of lease i.e on or before 12/12/1978. In the instant case the same was done within the due date.

And whereas, while the renewal application remained undecided, a Notice for Lapsing dated 22/09/2009 was issued to Smt. Kala N. Quirtonim, which was replied vide letter dated 29/09/2009, however no decision was taken at that time.

And whereas, a representation dated 08/06/2021 received from Ms Pradnya Zoivant Poi Cano (signed for self and on behalf of all other heirs of Late Mr. Naraina Quirtonim as their duly constituted attorney) requested for considering their case in terms of the provisions of Section 8A of the MMDR Act 1957 and the Common Cause Judgment of the Hon'ble Supreme Court and to execute necessary deed recognizing/treating the tenure of the said Mining Lease as subsisting till 2/6/2031.

And whereas, a Notice for Hearing dated 18/06/2021 was issued to decide on the representation dated 08/06/2021 of Smt Pradnya Zoivant Poi Cano and also on the lapsing notice which had remained undecided.

And whereas, hearing was conducted on 25/06/2021 and based on the documentary evidence produced, it was ascertained that lapsing notice is not maintainable and hence was withdrawn.

And whereas, with respect to the representation dated 08/06/2021, since the renewal application dated 10/12/1998 remained undecided with the office until the enactment of the MMDR Amendment Act, 2015, the lease bearing No. 3/FeMn79 shall get benefit of Sub-Section (3) to Section 8A of MMDR Act,

1957 r/w Sub-Section (6) to Section 8A of MMDR Amendment Act, 2015.

Now therefore, in view of the above mentioned provisions, since the lease was executed from 13/12/1979, the lease is deemed to have been granted for a period from 13/12/1979 to 12/12/2029 i.e for a term of 50 years as per Sub-Section (3) to Section 8A of MMDR Act, 1957, r/w Sub-Section (6) to Section 8A of the MMDR Amendment Act, 2015 subject to following general conditions:

(i) The Deemed grant shall not absolve the lessee or any other person claiming through the original lessee from payment of any dues, royalty, dead rent, surface rent, fine, compounding charges etc. which are due to the State Government from such lessee or any person claiming through him or the erstwhile lessee for their acts or omissions prior to the present Order.

(ii) The Deemed grant shall not absolve the lessee from any action under MMDR Act and Rules framed thereunder for the acts done prior to passing of this Order.

(iii) The lessee shall have to fulfill all the statutory/regulatory requirements under MMDR Act 1957, MCR 1960, MCDR 1988, as well as other Acts and Rules & Regulations, Notification to the satisfaction of relevant authorities under such Acts, Rules etc.

(iv) The Deemed grant Order is an administrative decision/ministerial act taken by subjective assessment of the facts and Application for First renewal, in exercise of powers under the MMDR Acts and Rules made thereunder. As such solely on basis of Deemed grant of lease, no mining operations shall be undertaken in the leasehold area unless

all clearances, NOCs Consents, permissions etc under various Legislations, rules, regulations, Notifications, etc. are in place. So also Orders of Hon'ble Supreme Court of India, High Court of Bombay at Panaji and administrative instructions, directives etc. issued by the Government or autonomous bodies like Goa State Pollution Control Board etc. are to be scrupulously followed, to the satisfaction of the concerned Authorities under relevant Legislations etc.

(v) The Deemed grant is also subject to the capping of production which may be imposed by state Government irrespective of the EC limit specified for this lease or group of leases.

(vi) This Deemed grant is subject to liberty of State Government to reduce the area of lease in the interest of Environment, Ecology, etc. which may be exercised by the State Government at any point of time.

(vii) The DGPS survey shall be the sole basis for Deemed grant of lease and such plans shall seal the boundary of lease on the basis of latitude and longitude as far as the Applicants are concerned. The survey numbers etc. mentioned in the plan if changed or required to be changed for any reason whatsoever like change of cadastral records after readjustment of the area of any village or survey number, or resurvey of any village or survey number or for similar reason. The change in the survey records shall accordingly be noted by the Director of Mines & Geology for the purpose of his records and all such changes shall be accordingly updated at any stage from the signing of the lease deed. Director of Mines & Geology is authorized to deal with all such issues including boundary dispute of adjoining leases and shall have the final authority to do the needful.

(viii) The lessee shall abide by the conditions laid down in this Order and the lease deed to be executed in this behalf.

(ix) The lessee shall obtain surface rights or obtain consent of the owner/occupier of land before entering the land for commencement of mining operation in the area.

(x) The lessee shall not commence mining operations without having mining plan, duly approved by the Indian Bureau of Mines.

(xi) The lessee shall execute a supplementary deed of lease on acceptance of terms and conditions mentioned herein.

(xii) The Lessee shall comply with the provisions of the Stamp Duty Act as amended from time to time to the satisfaction of the concerned authority under the Act.

(xiii) Similar provisions, not only limited to the above will be made applicable in case of deemed grant as per Sub-Section (3) to Section 8A of MMDR Act, 1957 r/w Sub-Section (6) to Section 8A of MMDR Amendment Act, 2015.

(Vivek H.P., IAS)
Director

ANNEXURE No. 2

भारतीय गैर न्यायिक INDIA NON JUDICIAL

भारत

एक हजार रुपये

ONE THOUSAND RUPEES

रु.1000

Rs.1000

INDIA

गोवा GOA

640344

SUPPLEMENTARY MINING LEASE DEED

THIS INDENTURE OF SUPPLEMENTARY MINING LEASE DEED is executed at Panaji, Goa on this 16th day of February, 2022;

BETWEEN

1. The **GOVERNOR OF GOA,** represented herein by Mr. VIVEK H.P., Director & ex officio Joint Secretary (Mines & Geology), Government of Goa, hereinafter referred to as the ***"State Government"***, which expression shall, where the context so admits, be deemed to include its successors-in-title and/or assigns, **OF THE ONE PART**

AND

2. **KALA NARAINA KIRTANI** *alias* **KALA NARAINA QUIRTONIM** *alias* **KALA NARAINA KIRTANY** , widow of late Mr. Naraina Sinai Quirtonim, age 83 years, housewife, Indian National, holding Aadhar Card No. 694919452441 and Permanent Account No. AFMPK3941B, residing at H. No. 1153, Mathura House, Aquem Alto, Margao, Goa, 403601, represented herein by her daughter and duly constituted attorney, Mrs. Pradnya Zoivant Poi Cano (Party No. 5 below), so constituted vide a Power of Attorney executed on 2.2.2021 before Shri N. R. Bale, Notary Public at Margao, Goa and registered in his Notarial Register under No. 17989/2021;

P Cano

3. **PRIYA PRASAD NAVELKAR**, daughter of Late Mr. Naraina Sinai Quirtonim, age 46 years, married, business, Indian National, holding Aadhar Card No. 896074605858 and allotted Permanent Account No. AGCPN8495N residing at H. No. 918, Ganesh Krupa, Colmorod, Behind ESI Hospital, Navelim, Margao, Goa, 403707 and her husband

4. **PRASAD PREMANAND NAVELKAR**, son of Mr. Premanand Navelkar, age 52 years, married, businessman, Indian National, holding Aadhar Card No. 256309152491 and allotted Permanent Account No. ACCPN7884K, residing H. No. 918, Ganesh Krupa, Colmorod, Behind ESI Hospital, Navelim, Margao, Goa, 403707;

Parties Nos. 3 and 4 are represented herein by their sister/sister-in-law and duly constituted attorney, viz. Mrs. Pradnya Zoivant Poi Cano (Party No. 5 below), so constituted vide a Power of Attorney executed on 2.2.2021 before Shri N.R. Bale Notary Public at Margao, Goa and registered in his Notarial Register under No. 17990/2021;

P Cano

5. **PRADNYA ZOIVANT POI CANO** alias **PRADNYA ZOIVANT PAI CANO**, daughter of Late Mr. Naraina Sinai Quirtonim, age 43 years, married, businessperson, Indian National, holding Aadhar Card No. 247025647014 and allotted Permanent Account No. ASYPP2866P, residing at H. No. 600,Sitara Bajaj , Bhawani Sadan, Colmorod, Navelim, Goa, 403707 and her husband

6. **ZOIVANT MHALU POI CANO** alias **ZOIVANT MHALU PAI CANO**, son of Mr. Mhalu Poi Cano, age 53 years, married, businessman, Indian National, holding Aadhar Card No. 463975179381 and allotted Permanent Account No. ACAPP6617L, residing at H. No. 600, Sitara Bajaj, Bhawani Sadan, Colmorod, Navelim, Goa, 403707, represented herein by his wife and duly constituted attorney, Mrs. Pradnya Zoivant Poi Cano (Party No. 5 above), so constituted vide a Power of Attorney executed on 2.2.2021 before Shri N.R. Bale Notary Public at Margao, Goa and registered in his Notarial Register under No. 17988/2021;

(hereinafter referred to as the "*Lessees*", which expression shall, where the context so admits, be deemed to include all their respective heirs, executors, legal representatives,

P Cano

administrators, representatives and/or their permitted assigns) **OF THE OTHER PART.**

WHEREAS:

1. Vide a Mining Lease Deed bearing No. 3/FeMn/79 dated 13.12.1979, which Lease Deed is duly registered in the office of the Sub- Registrar of Quepem Taluka on 3.6.1981 under Registered No. 172 at Book I, Vol. 3 at pages 77 to 85 (hereinafter referred to as the *"**Said Mining Lease Deed**"*), the Government of Goa granted to Mr. Naraina Sinai Quirtonim (hereinafter referred to as the ***"Said Naraina Quirtonim"***), a mining lease in respect of an Iron Ore and Manganese Ore mine admeasuring 70.20 Hectares, situated in Village Cavrem of Quepem Taluka, South Goa, Goa and described in the Schedule hereunder written (hereinafter referred to as the *"**Said Mine**"*), for a period of 20 years (hereinafter referred to as the *"**Said Mining Lease**"*).

2. The Said Naraina Quirtonim died on 22.4.1998, leaving behind him the Lessees herein as his exclusive successors-in-title, so duly certified by a Deed of Succession dated 13.7.1998 drawn up before the Sub-Registrar of Salcete Taluka at Margao, Goa

Cano

on 21.7.1998 and recorded in his Deeds Book No. 1396 at Folio 26 (overleaf) onwards.

3. Party No. 2 herein (Kala N. Quirtonim), the widow and one of the legal successors-in-title of the Said Naraina Quirtonim, for herself and as constituted attorney of the other legal heirs of the Said Naraina Quirtonim, filed an Application in Form J on 10.12.1998 for renewal of the Said Mining Lease (hereinafter referred to as the ***"Said Renewal Application"***), in terms of Rule 24A(1) of the Mineral Concession Rules, 1960, within the prescribed time limit.

4. During the pendency of the disposal of the Said Renewal Application, the Mines and Minerals (Development and Regulation) Act, 1957 (hereinafter referred to as the ***"MMDR Act"***) came to be amended by the Mines and Minerals (Development and Regulation) Amendment Act, 2015 (hereinafter referred to as the ***"MMDR Amendment Act 2015"***), effective from 12.1.2015, providing for a tenure of 50 years to mining leases.

5. Since the Said Renewal Application was pending at the time of the coming into force of the MMDR Amendment 2015, the Lessees are entitled to the benefit of the 50 years' tenure to the

Cano

Said Mining Lease, in terms of Sub-section (3) of Section 8A of the MMDR Act read with Sub-section (6) of Section 8A of the MMDR Act.

6. Consequently, in terms of Sub-section (3) of Section 8A of the MMDR Act, read with Sub-section (6) of Section 8A of the MMDR Act, the Said Mining Lease is deemed to have been granted for a period of 50 years from 13.12.1979 to 12.12.2029 (hereinafter referred to as the ***"Deemed Grant"***).

7. Vide Order bearing No. 96/51/99-Mines/1840 dated 04.01.2022 (hereinafter referred to as the ***"Deemed Grant Order"***), the Director of Mines & Geology, Government of Goa, communicated the factum of the Deemed Grant to the Lessees as also the General Conditions which the Deemed Grant was subject to.

8. The present deed is accordingly being executed to record the Deemed Grant of the Said Meaning Lease from 13.12.1979 to 12.12.2029 (both days inclusive).

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NOW THEREFORE, THIS SUPPLEMENTARY MINING LEASE DEED WITNESSETH AS UNDER :-

1) The Said Mining Lease is deemed to have been granted from 13.12.1979 to 12.12.2029 (both days inclusive).

2) This Deed being supplementary to the Said Mining Lease Deed referred to in Recital 1 hereinabove, the terms and conditions contained in this Supplementary Deed shall be in addition to terms and conditions contained in the Said Mining Lease Deed. However, in the event of any conflict between the terms and conditions contained in this Supplementary Deed and the terms and conditions contained in the Said Mining Lease Deed, the terms and conditions contained in this Supplementary Deed shall prevail.

3) The Deemed Grant shall not absolve the Lessees or any other person claiming through the original Lessee (Said Naraina Quirtonim) from payment of any dues, royalty, dead rent, surface rent, fine, compounding charges etc. which are due to the State Government in respect of the Said Mining Lease and/or for any acts or omissions prior to the Deemed Grant Order.

P Cano

4) The Deemed Grant shall not absolve the Lessees from any action under the MMDR Act and Rules framed thereunder, for the acts done prior to the passing of the Deemed Grant Order.

5) The Lessees shall fulfil all the statutory/regulatory requirements under the MMDR Act, Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016 , Mineral Conservation and Development Rules, 2017 as well as other Acts and Rules & Regulations, Notifications, to the satisfaction of the relevant authorities under such Acts, Rules etc.

6) The Deemed Grant Order is an administrative decision/ministerial act taken by subjective assessment of the facts and Application for First Renewal, in exercise of powers under the MMDR Acts and Rules made thereunder. As such, solely on basis of Deemed Grant Order, no mining operations shall be undertaken in the leasehold area of the Said Mine unless all clearances, NOCs, Consents, permissions etc. under various Legislations, rules, regulations, Notifications etc. are in place. So also, all Orders of Hon'ble Supreme Court of India, High Court of Bombay at Panaji and administrative instructions, directives etc. issued by the Government or autonomous bodies like the Goa State Pollution Control Board etc.

Cano

are to be scrupulously followed, to the satisfaction of the concerned Authorities under relevant Legislations etc.

7) The Deemed grant is also subject to the capping of production which may be imposed by the State Government irrespective of the EC limit specified for the Said Mine or group of leases.

8) This Deemed Grant is subject to liberty of State Government to reduce the area of lease of the Said Mining Lease in the interest of Environment, Ecology, etc. which may be exercised by the State Government at any point of time.

9) That DGPS survey shall be the sole basis for determining the area of the Said Mining Lease under the Deemed Grant and such plans shall seal the boundary of lease on the basis of latitude and longitude as far as the Lessees are concerned. The Survey numbers etc. mentioned in the plan if changed or required to be changed for any reason whatsoever like change of cadastral records after readjustment of the area of any village or survey number, or resurvey of any village or survey number or for similar reason. The change in the survey records shall accordingly be noted by the Director of Mines & Geology for the purpose of his records and all such changes shall

be accordingly updated at any stage from the signing of the lease deed. The Director of Mines & Geology is authorised to deal with all such issues including boundary disputes of adjoining leases and shall have the final authority to do the needful. The DGPS Plan duly approved by the Directorate of Mines and Geology on 10/12/2021 is annexed hereto as **ANNEXURE "A".**

10) The Lessees shall abide by all the conditions laid down in the Deemed Grant Order.

11) The Lessees shall obtain surface rights or obtain consent of the owner/occupier of land before entering the Said Mine for commencement of mining operations in the Said Mine.

12) The Lessees shall not commence mining operations without having a mining plan, duly approved by the Indian Bureau of Mines.

13) This Supplementary Mining Lease Deed records the extension of the period of the Said Mining Lease by operation of law, viz. sub-section (3) of Section 8A of the MMDR Act read with Sub-section (6) of Section 8A of the MMDR Act. Hence, this Deed is executed on stamp paper of Rs. 1,000/-.

R Cano

14) The Lessee shall comply with the provision of the Stamp Duty Act as amended from time to time to the satisfaction of the concerned Authority under the Act.

15) Similar provisions, not only limited to the above will be made applicable in case of deemed grant as per Sub-Section (3) to Section 8A r/w Sub-Section (6) to Section 8A of MMDR Act, 1957.

SCHEDULE

All that tract of land situated at revenue village Cavrem, Taluka Quepem, District South Goa, State Goa, which bears Survey No. 19(part) of revenue village Cavrem, admeasuring 70.20 Hectares (as per the Digital Global Positioning System Plan), and bounded as follows:-

On North, South and West:	By balance portion of Survey No. 19
On East:	By balance portion of Survey No. 19 and Survey No. 14(part)

A plan of the aforesaid tract of land is annexed as Annexure "A" herein.

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

Cano

SIGNED AND EXECUTED BY THE STATE GOVERNMENT

Director of Mines & Geology, Directorate of Mines & Geology, Government of Goa, Panaji - Goa.	For and on behalf of the Governor of Goa (VIVEK H.P.) Director & ex officio Joint Secretary (Mines & Geology) Government of Goa

Left-hand finger-prints of VIVEK H.P.

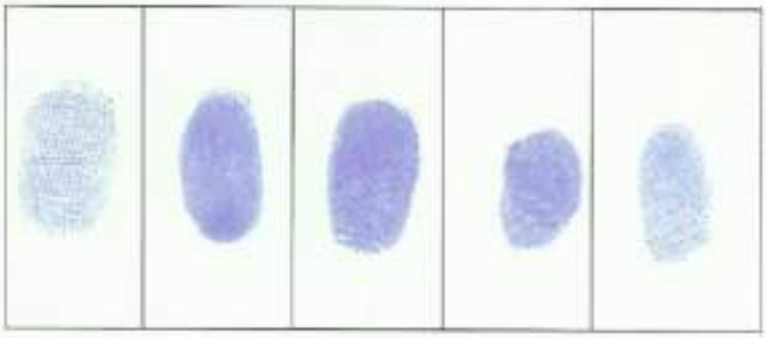
Right-hand finger-prints of VIVEK H.P.

Cano

SIGNED AND EXECUTED BY THE LESSEES

	For self and on behalf of the other Lessees as their duly constituted Attorney Cano (PRADNYA ZOIVANT POI CANO)

Left-hand finger-prints of PRADNYA ZOIVANT POI CANO



Right-hand finger-prints of PRADNYA ZOIVANT POI CANO

Cano

Witnesses:

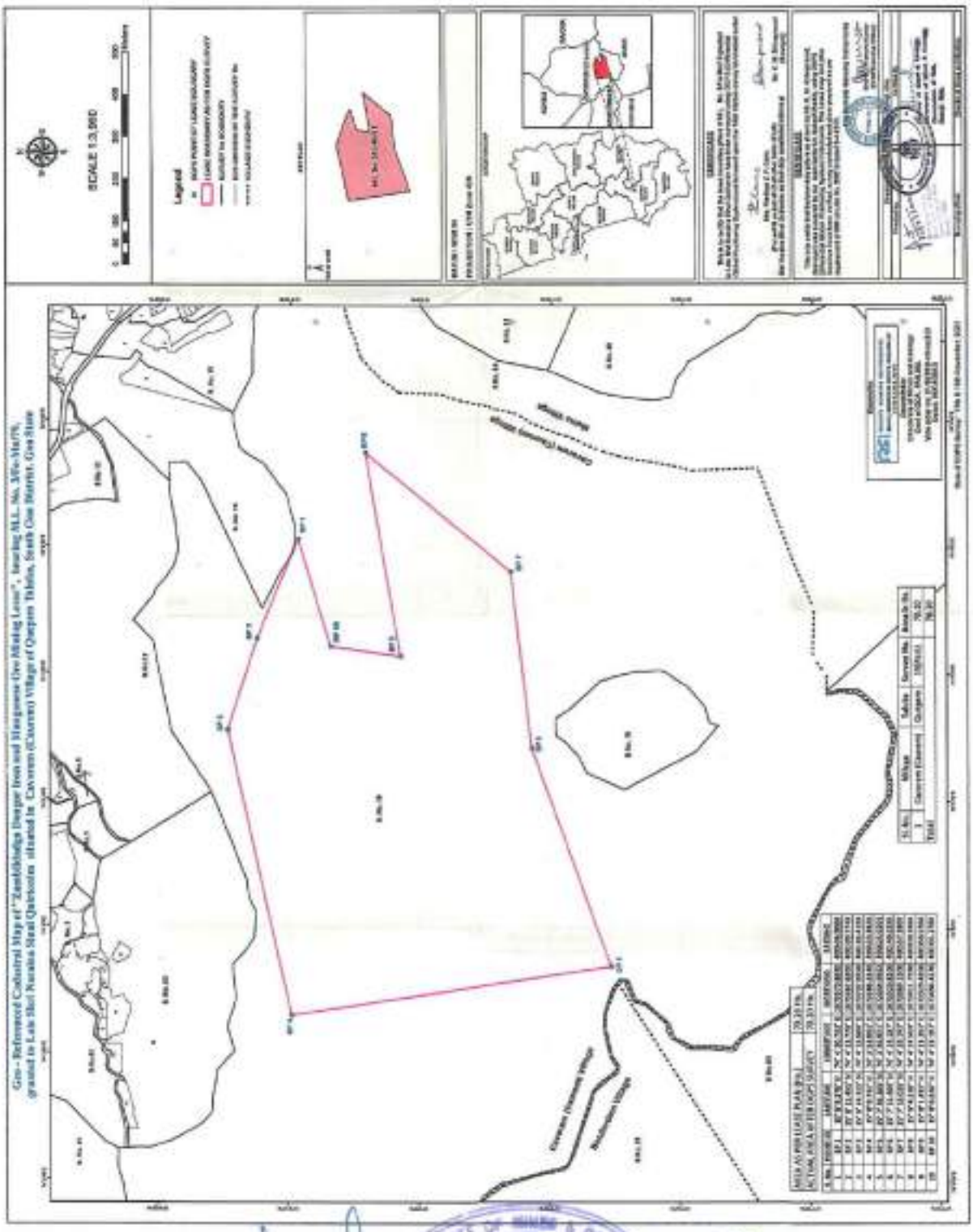
1. Signature : _____
   Name: SANKALP . U. SHET DESSAI
   Address: ASSISTANT GEOLOGIST, DIRECTORATE of MINES & Geology
   INSTITUTE of MENEZES BRAGANZA, GROUND FLOOR,
   PANAJI-GOA.

2. Signature : _____

   Name: PAVANKUMAR
   Address: SANQUELIM, GOA

Canno

ANNEXURE "A"


SCALE 1:3,960
Legend
Geo - Referenced Cadastral Map of "Zantekhodya Dongar Iron and Manganese Ore Mining Lease", bearing M.L. No. 3/96-Mat/98, granted to Late Shri Narsinha Sitaal Qalekotkar situated in Curtorim (Curtorim) Village of Cheporem Taluka, South Goa District, Goa State
DIRECTORATE OF MINES & GEOLOGY
GOVERNMENT OF GOA, PANAJI

ANNEXURE No. 3

Gram : MINESBURO
Phones : 721618, 721959
Fax : (0834) 737359

REGD PARCEL

पो.

No. MP/MAN-283/GOA/97-98 931c

भारत सरकार
GOVERNMENT OF INDIA
खान मंत्रालय
MINISTRY OF MINES
भारतीय खान ब्यूरो
INDIAN BUREAU OF MINES
मडगांव – गोवा
MARGAO - GOA

दिनांक

Dated The 16th March 1998.

From : Regional Controller of Mines,
Indian Bureau of Mines.

To : Shri Nacaina Sinai Quirtonin.
Importers of Spare Parts,
Engineers & Contractors.
P.O Box No.284,
MARGAO - GOA (403 601).

Sub : Approval of Mining Plan in respect of Caurem Iron & Manganese Ore Mine (M.L No.3/FeMn/79) for an area of 70.28 Hects. situated in Survey No.19 (part), Caurem Village, Quepem Taluka, South Goa District of Goa State, submitted under Rule 11 of MCDR, 1988.

Ref : 1) Your letter No.8/60/NSG/97-98 dated 12/13.5.97, submitting draft Mining Plan.

2) This office letter of even number dated 1.12.97.

3) Your letter No. Nil dated 22.12.97, submitting final five bound copies of the aforesaid Mining Plan.

Sir,

In exercise of the power conferred by sub-rule (4) of Rule 11 of Mineral Conservation & Development Rules, 1988, I hereby approve the Mining Plan in respect of Caurem Iron & Manganese Ore Mine (M.L No. 3/FeMn/79) for an area of 70.28 Hects. situated in Survey No.19 (part), Caurem Village, Quepem Taluka, South Goa District of Goa State. This approval is subject to the following conditions :-

1) This Mining Plan is approved without prejudice to any other laws applicable to the mine/area from time to time, whether made by the Central Government, State Government or any other authority.

2) It is further clarified that this approval of the Mining Plan under Rule 11 is subject to the provisions of Forest (Conservation) Act, 1980, Forest Conservation Rule 1981 and other relevant statutes, orders and guide-lines as may be applicable to the lease area from time to time.

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

4) It is also clarified that the approval of your aforesaid Mining Plan does not in any way imply the approval of the Government in terms of any other provision of Mines & Minerals (Regulation and Development) Act, 1957, the Mineral Concession Rules, 1960, and the rules framed thereunder or any other laws including Forest (Conservation) Act, 1980.

5) If no permission is received to extend mining operations in the forest Area from Competent Authorities and the workings have reached the allowable limits, the mine owners may submit a modified Mining Plan under Rule 10 of MCDR, 1988.

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

Yours faithfully,

(ASHOK KUMAR)
Regional Controller of Mines.

Encls : A copy of the approved Mining Plan containing 37 pages, 8 Annexures & 13 Plates.

Copy for information to Shri R.C Gaudde, Yashwant Prione Apartments, Mangor Hills, Vasco-da-Gama, Goa - 403 802.

(ASHOK KUMAR)
Regional Controller of Mines.

REGD. PARCEL

91/c

भारत सरकार
GOVERNMENT OF INDIA
खान मंत्रालय
MINISTRY OF MINES
भारतीय खान ब्यूरो
INDIAN BUREAU OF MINES
क्षेत्रीय खान नियंत्रक का कार्यालय
Office of the Regional Controller of Mines

गणतंत्र 50 REPUBLIC

No MSH/ MAN-76/GOA/2003-04 Date : 10/07/2003

Smt. Kala Namina Sinai Quirtonim,
P.O. Box No. 284,
Margao Goa (403 601)

Sub.: Approval of Mining Scheme in respect of your "Cavrem" Mine (M.L. No. 3/FeMn/79) for an area of 70.28 ha. situated in Cavrem village, Quepem taluka, South Goa district of Goa state.

Ref.. (i) Your letter No. Nil dtd. 30.05.2003, submitting two copies of draft Mining Scheme of aforesaid mine.
(ii) This office letter of even number dated 27.05.2003.
(iii) Your letter No Nil dated 26/27.06.2003, submitting final bound copies of modified Mining Scheme of aforesaid mine.

Madam,

In exercise of the powers conferred by sub-rule (4) of Rule 12 of the Mineral Conservation & Development Rules, 1988, I hereby approve the Mining Scheme in respect of your aforesaid mine. This approval is subject to the following conditions:

1) This Mining Scheme is approved without prejudice to any other laws applicable to the mine/area from time to time whether made by the Central Government, State Government or any other Authority.

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

3) It is also clarified that the approval of your aforesaid Mining Scheme does not in any way imply the approval of the Government in terms of any other provisions of the Mines and Minerals (Development & Regulation) Act, 1957 as amended or the rules framed there under and any other laws including Environment Protection Act, 1986 and the rules framed there under including any notifications regarding Protection of Wild Life Sanctuary etc..

4) It is further clarified that this approval of the Mining Scheme is subject to the provision of Forest (Conservation) Act, 1980, Forest Conservation Rules, 1981 and other relevant statute, orders and guidelines as may be applicable to the lease area from time to time

Contd ...2/-

A/c TA(O)

Directorate of Industries and Mines
Inward No. 2245
Date 20/8/03

New National Highway
Near Adem Breweries Ltd.
P.O. FATORDA-403 602 MARGAO (GOA)
Tel. 0832-2741758(Fax),2741757,2741756 (Tele)
e-mail : rcomgoa@goatelecom.com
Gram : MINESBURO

5) Your attention is invited to the Hon'ble Supreme Court's Interim Order on WPC No 202 dated 12.12.96 for compliance. The approval of this Mining Scheme is, therefore, issued without prejudice to and is subject to the said direction of the Hon'ble Supreme Court, as applicable in your case.

6) This approval of Mining Scheme is subject to the condition that you should submit mine closure plan under Rule 23A of the Mineral Conservation and Development Rules, 1988 as a part/component of the Mining Scheme at the earliest.

7) The comments suggested by the Director of Mines Safety, Margao on safety precautions and other provisions, if any, will be communicated to you as and when received. Same must be taken care of while implementing the Mining Scheme.

Yours faithfully,

Encl : A copy of approved
Mining Scheme containing
26 Pages of Text, 01 Annexures &
09 Plates

Sd/-
(Ranjan Sahai)
Regional Controller of Mines

Copy forwarded for information to: Shri. Anand Lele, A-9, Bansui Plaza, Curchorem, Goa-403 706.

Sd/-
(Ranjan Sahai)
Regional Controller of Mines

पहले दो प्रतियाँपर नही है ।

प्रतिलिपी सूचनार्थ प्रेषित :-

1) खान निदेशक (इ. आं.), भारतीय खान ब्यूरो, बैंगलोर-22 को अनुमोदित खनन अधियोजना के साथ ।

2) निदेशक, खान सुरक्षा, फानिपा सिरिंडा, मडगांव गोवा - 403601 को अनुमोदित खनन अधियोजना के साथ । उनसे अनुरोध है कि यदि कोई टिप्पणी हो तो आगे की कार्रवाई के लिए पार्टी से संपर्क करने हेतु 50 दिनो के अंदर इस कार्यालय को भेजे ।

3) निदेशक, उद्योग और खान निदेशालय , गोवा सरकार, खान स्कैप, उद्योग भवन, पणजी-गोवा को अनुमोदित खनन अधियोजना के साथ ।

4) मान्यता प्राप्त योग्य व्यक्ति को पिमिस्त / खान सिसिल /गार्ड पिसिस हेतु ।

10/2/97

(रंजन सहाय)
क्षेत्रीय खान नियंत्रक

CL4/vv/APRms/118-119

BY REGD. A/D

सत्यमेव जयते

भारत सरकार / GOVERNMENT OF INDIA
खान मंत्रालय / MINISTRY OF MINES
भारतीय खान ब्यूरो / INDIAN BUREAU OF MINES
पो. फातोर्डा, मडगांव - गोवा 403 602 / P. O: Fatorda, Margao, Goa - 403 602

Tel : (O) 0832 - 2741758 (D),
2741757 (PBX)
(R) 0832 - 2741755
Fax. 0832 - 2741759
E-mail. roomgoa@sancharnet.in
ibmgoa@sancharnet.in

No. MSH/MAN-76/GOA/2003-04 Vol.-I

Date - 22 / 06 / 2007

Smt. Kala N. Kirtani,
Mathura, House No.- 1153,
Near Apna Bazar,
Alto-Aquem, Margao,
GOA – 403 601

Sub: **Approval of Modifications to Approved Mining Scheme with PMCP in respect of your Zamblidadga Dongar Mine (M. L. No. 3/FeMn/79) for an area of 70.28 Ha. situated in Caurem -Village, Quepem -Taluka, South Goa -District of Goa State.**

Ref.: (i) Your letter No. Nil dtd. 30.04.2007 submitting two draft copies of Modifications in Approved Mining Scheme with PMCP in respect of aforesaid mine.
(ii) This office letter of even number (dated 15.05.2007
(iii) Your letter No. Nil dated 20.06.2007 submitting five bound copies of Modified Mining Scheme alongwith PMCP and Bank Guarantee for **Rs. 1,00,000/-** bearing Guarantee No. CBOP-MRG-050/A dated 14.06.2007 valid upto 10/07/2007 from The Centurion Bank of Punjab Ltd., Margao Branch, Goa.

Madam,

In exercise of the powers conferred by sub-rule (2) of Rule 10 of the Mineral conservation & Development Rules, 1988, I hereby **approve** the modifications to the extent proposed in this modifications of approved Mining Scheme earlier approved vide letter no. MSH/MAN-76/GOA/2003-04 dated 10/07/2003. This approval is subject to the following conditions :

(1) The conditions at Sl. No. 1 to 5 and 7 already levied in the earlier letter of approval of Mining Scheme dated 10.07.2003 remains unchanged.

(2) A copy of the EIA & EMP report as approved by the Ministry of Environment & Forest, New Delhi, should be submitted to this office within a month of approval alongwith a copy of their approval letter.

(3) This department does not undertake any responsibility regarding correctness of the boundaries of the lease area shown on the ground with reference to lease map & other plans furnished by the applicant/lessee.

....2'-

(4) The external dumping beyond lease area is subject to permission obtained from every concerned / affected Authority / Society. Due safety & environmental safeguards should be undertaken as prescribed by the Competent Authorities in this regard.

(5) Regular monitoring of benches, pit slope & dumping operations should be carried out against any ground movement.

(6) Yearly report as required under rule 23B(2) of MCDR '88 setting forth the extent of protective and rehabilitative works carried out as envisaged in the approved progressive mine closure plan and if there is any deviations, reasons thereof shall be submitted before 1st July of every year.

(7) The Validity period of the Financial Assurance should be renewed before the expiry of the same & should be submitted to this office.

Yours faithfully,

Encls : A copy of Modifications in Approved Mining Scheme

Sd/-

(रंजन सहाय / **Ranjan Sahai**)
खान नियंत्रक (मध्यांचल) एवं प्रभारी, गोवा क्षेत्रीय कार्यालय
Controller of Mines (CZ) & In-charge Goa Regional Office

Copy without enclosure forwarded for information to :- **Shri. B. S. Nargund**, Flat No. 1, First Floor, De Costa Mansion, Near Cuda Hall, Curchorem, Goa – 403 706.

(रंजन सहाय / **Ranjan Sahai**)
खान नियंत्रक (मध्यांचल) एवं प्रभारी, गोवा क्षेत्रीय कार्यालय
Controller of Mines (CZ) & In-charge Goa Regional Office

भारत सरकार/ GOVERNMENT OF INDIA

खान मंत्रालय/ MINISTRY OF MINES

भारतीय खान ब्यूरो/ INDIAN BUREAU OF MINES

खान नियंत्रक (दक्षिण अंचल) का कार्यालय

OFFICE OF THE CONTROLLER OF MINES (SOUTH ZONE)

Fax: (080) 23373287
Tel: (080) 23373287/ 23375366-67
E-mail: cgmsz@rediffmail.com

29, Industrial Suburb, IIStage,
TumkurRoad, Goragunapalya,
Yeshwanthpur, Bangalore- 560 022.

No. MS/SG/GOA /FeMn-46-SZ/814 **Date: 04.05.2010**

To

Mrs. Kala N.S.Kirtany
(Legal heir of Late Naraian Sinai Kirtani)
House No.1153, Mathura,
Near Apna Bazar, Aquem-Alto-Margao,
Goa-403 601.

Sub: Approval of Scheme of Mining (including Progressive Mine Closure Plan) in respect of your Zamblidadga Dongor Iron & Manganese ore Mine over an extent of 70.28ha in Canrem Village, Quepem Taluka, South Goa District, Goa state submitted under Rule 12 of MCDR, 1988.

Ref: Your letter No. Nil dated 06.04.2010 submitting the final copies of Scheme of Mining.

Madam,

In exercise of the power conferred by sub rule (4) of Rule 12 of Mineral Conservation and Development Rules, 1988, I hereby approve the aforesaid Scheme of Mining (including Progressive Mine Closure Plan). This approval is subject to the following conditions:

(1) The Scheme of Mining (including Progressive Mine Closure Plan) is approved without prejudice to any other law applicable to the area from time to time whether made by the Central Government, State Government or any other authority.

(2) The Scheme of Mining (including Progressive Mine Closure Plan) is approved without prejudice to any order or direction from any court of competent jurisdiction.

(3) It is also clarified that the approval of your aforesaid Scheme of Mining (including Progressive Mine Closure Plan) does not in any way imply the approval of the Government in terms of any other provision of the Mines and Minerals (Development & Regulation) Act, 1957, or the rules framed there under and any other law.

(4) It is further clarified that the approval of the Scheme of Mining (including Progressive Mine Closure Plan) is subject to the provision of Forest (Conservation) Act, 1980, Forest Conservation Rules, 2003 and other relevant statutes, orders and guidelines as may be applicable to the lease area from time to time.

(5) Your attention is invited to the Hon'ble Supreme Court's Interim Order on WP(C) No.202 dated 12.12.1996 for compliance. The approval of this Mining Plan (including Progressive Mine Closure Plan) is therefore, issued without prejudice to and is subject to the said direction of the Hon'ble Supreme Court as applicable in your case

(6) Provisions of the Mines Act, 1952 and Rule & Regulations made there under including submission of notice of opening, appointment of manager and other statutory officials as required by the Mines Act, 1952 shall be complied with.

(7) The execution of mining plan/ scheme of mining shall be subjected to vacation of prohibitory orders/ notices, if any.

Contd.....2

(8) 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 Department of Environment guidelines and keeping in view IBM's Circular No. 3/92, season-wise every year or by engaging preferably the services of an Environmental laboratory approved by MOEF/ CPCB. The data so generated shall be maintained in a bound paged register kept for the purpose and the same shall be made available to the inspecting officer on demand.

(9) If anything is found to be concealed as required by the Mines Act in the contents of Scheme of Mining and the proposal for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect further at any stage, if it is observed that the information furnished in the document are incorrect or misrepresent facts, the approval of the document shall be revoked with immediate effect.

(10) The validity period of the financial assurance should be renewed before the expiry of the same and should be submitted to the Regional Controller of Mines, Indian Bureau of Mines, Goa, under intimation to this office.

(11) A yearly report shall be submitted to the Regl. Controller of Mines, Indian Bureau of Mines, Goa 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

(12) Since the mining lease falls within a radius of 10kms 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) A copy of EIA/ EMP report, approved by MOEF, New Delhi, should be submitted to this office as well as to the Regional Controller of Mines, Indian Bureau of Mines, Goa, within one month of its approval along with a copy of their approval letter.

(14) This department does not undertake any responsibility regarding correctness of the boundaries of the lease area shown on the ground with reference to lease map & other plans furnished by the applicant/lessee.

Yours faithfully,

4/5/10

(R.K.SINHA)
खान नियंत्रक (क्षे.आ.)
Controller of Mines (SZ)

Encls: One copy of the approved Scheme of Mining (including Progressive Mine Closure Plan).

Copy for kind information to:

(a) Shri K.Kantharaj, RQP, METAMORPHOSIS, 2nd Cross, Near Akshaya Hospital, Ashoka Nagar, Tumkur-572 102.
(b) Chief Controller of Mines, IBM, Nagpur.
(c) The Director of Mines Safety, Fatima Building, Margao, Goa along with a copy of approved Scheme of Mining (including Progressive Mine Closure Plan).
(d) The Regional Controller of Mines, IBM, Goa, along with a copy of the approved Scheme of Mining (including Progressive Mine Closure Plan) for further follow up.
(e) The Director of Industries & Mines, Govt. of Goa, Mining Wing, Udyog Bhavan Panaji, Goa PIN- 403 001 approved Scheme of Mining (including Progressive Mine Closure Plan).

Encl: As above

(R.K.SINHA)
खान नियंत्रक (क्षे.आ.)
Controller of Mines (SZ)

भारत सरकार/ GOVERNMENT OF INDIA
खान मंत्रालय/ MINISTRY OF MINES
भारतीय खान ब्यूरो/ INDIAN BUREAU OF MINES
खान नियंत्रक (दक्षिण अंचल) का कार्यालय

OFFICE OF THE CONTROLLER OF MINES (SOUTH ZONE)

Fax. (080) 23373287
Tel: (080) 23375365/ 23375366-67
E-mail: zo.bangalore@ibm.gov.in

29, Industrial Suburb, IIStage,
Tumkur Road, Goragunta palya,
Yeshwanthpur, Bangalore- 560 022.

No. MS/SG/GOA/FeMn-65-SZ **Date: 05.12.2012**

To,
Mrs. Kala N.S.Kirtany
Legal Heir of Late Narain Sinai Kirtani.
House No.1153, Mathura,
Near Apna Bazar,
Aquem-Alto-MargaopGoa-403 601.

Sub: Approval of Scheme of Mining (including Progressive Mine Closure Plan) in respect of your Zamblidadga Dongor Iron and Manganese Ore Mine (ML.No.03/FeMn/79) over an area of 70.28Ha situated in Caurem village, Quepem Taluka, South Goa Dist. Goa state submitted under Rule 12 (3) of MCDR, 1988.

Ref: Your POA Holder letter no ZDinn-HQ-TS-IBM-002-004-12 dated 14.09.2012 submitting the final copies of Scheme of Mining (including Progressive Mine Closure Plan).

Madam,

In exercise of the power conferred by sub rule (4) of Rule 12 of Mineral Conservation and Development Rules, 1988, I hereby **approve** the aforesaid Scheme of Mining (including Progressive Mine Closure Plan). This approval is subject to the following conditions.

(1) The Scheme of Mining (including Progressive Mine Closure Plan) is approved without prejudice to any other law applicable to the area from time to time whether made by the Central Government, State Government or any other authority

(2) The Scheme of Mining (including Progressive Mine Closure Plan) is approved without prejudice to any order or direction from any court of competent jurisdiction.

(3) It is also clarified that the approval of your aforesaid Scheme of Mining (including Progressive Mine Closure Plan) does not in any way imply the approval of the Government in terms of any other provision of the Mines and Minerals (Development & Regulation) Act, 1957, or the rules framed there under and any other law.

(4) It is further clarified that the approval of the Scheme of Mining (including Progressive Mine Closure Plan) is subject to the provision of Forest (Conservation) Act, 1980, Forest Conservation Rules, 2003 and other relevant statutes, orders and guidelines as may be applicable to the lease area from time to time.

(5) Your attention is invited to the Hon'ble Supreme Court's Interim Order on WP(C) No 202 dated 12.12.1996 for compliance. The approval of the Scheme of Mining (including Progressive Mine Closure Plan) is therefore, issued without prejudice to and is subject to the said direction of the Hon'ble Supreme Court as applicable in your case.

(6) A copy of EIA/ EMP report, approved by MOEF, New Delhi, should be submitted to this office as well as to the Regional Controller of Mines, Indian Bureau of Mines, Goa, within one month of its approval along with a copy of their approval letter

(7) Provisions of the Mines Act, 1952 and Rule & Regulations made there under including submission of notice of opening, appointment of manager and other statutory officials as required by the Mines Act, 1952 shall be complied with.

...2

(8) The execution of mining plan/ scheme of mining shall be subjected to vacation of subsidiary orders/ notices, if any.

(9) 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 Department of Environment guidelines and keeping in view IBM's Circular No. 3/92, season-wise every year or by engaging preferably the services of an Environmental laboratory approved by MOEF/ CPCB. The data so generated shall be maintained in a bound paged register kept for the purpose and the same shall be made available to the inspecting officer on demand.

(10) If anything is found to be concealed as required by the Mines Act in the contents of Scheme of Mining and the proposal for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect, further at any stage, if it is observed that the information furnished in the document are incorrect or misrepresent facts, the approval of the document shall be revoked with immediate effect.

(11) The validity period of the financial assurance should be renewed before the expiry of the same and should be submitted to the Regional Controller of Mines, Indian Bureau of Mines, Goa, under intimation to this office.

(12) A yearly report shall be submitted to the Regl. Controller of Mines, Indian Bureau of Mines, Goa 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

(13) In case the mining lease falls within 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

(14) This department does not undertake any responsibility regarding fixing of boundary pillars on the ground & correctness of the boundaries of the lease area shown on the ground with reference to lease map & other plans furnished by the applicant/lessee.

(15) The contents of Circular No 2/2010 issued by the Chief Controller of Mines, Indian Bureau of Mines, Nagpur vide his letter No- [10(3/3/MP/90-CCOM VOL-VII dated 06.04.2010 shall be complied with, within a period of six months from the date of approval of this document failing which the approval shall be deemed to have been withdrawn.

(16) The Scheme of Mining 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 leasehold.

Encls: One copy of the approved Scheme of Mining (Including Progressive Mine Closure Plan).

Yours faithfully,

(R.K.SINHA)
खान नियंत्रक (क्षे.अ.)
Controller of Mines (SZ)

Copy for kind information to:

(a) Shri K.Kantraj, RQP Metamorphosis, KSF Bhavan, I Floor, 4th Main, 2nd Block, 2nd Cross, Kuvempu Nagar, Tumkur 572 103
(b) Chief Controller of Mines, Indian Bureau of Mines, Indira Bhavan, Civil Lines, Nagpur-1
(c) The Director of Mines Safety, Fatima Building, Margao, Goa State along with a copy of the approved Scheme of Mining (including Progressive Mine Closure Plan).
(d) The Regional Controller of Mines, IBM, Goa, along with a copy of the approved Scheme of Mining (including Progressive Mine Closure Plan) for further follow up.
(e) The Director of Industries & Mines, Govt. of Goa, Mining Wing, Udyog Bhavan Panaji, Goa PIN- 403 001.

Encl: As above

(R.K.SINHA)
खान नियंत्रक (क्षे.अ.)
Controller of Mines (SZ)

ANNEXURE No. 4

From:
Kala N. S. Kirtani
'Mathura House No. 1153
Near Apna Bazar, Alto Aquem,
Margao – Goa

Date: 02nd Aug., 2006

To,
The Regional Controller of Mines
Indian Bureau of Mines
Goa Region
Margao – Goa

Sub: Notice of temporary discontinuance of mine under Rule No. 24 of MCDR 1988 in respect of Zamblidadga Dongor Mine bearing Lease No. 3/Fe/Mn/79 in South Goa District of Goa State.

Sir,

Enclosed herewith please find notice of temporary discontinuance of mine in Form D-1 under Rule No. 24 of MCDR 1988 in respect of Zamblidadga Dongor Mine bearing Lease No. 3/Fe/Mn/79 in South Goa District of Goa State.

We are temporarily discontinuing the mining operations in view of the permissions required under Forest Conservation Act and Environment Act.

Hoping for kind consideration of the request.

Thanking you.

Yours truly,

Kala Narsina Kirtany

Kala Kirtani

Encl: Form D-1

Cc:
1. The Controller of Mines, IBM Bangalore
2. The Controller General, IBM Nagpur
3. The Directorate of Mine, Panaji – Goa.

4/8/06
प्राप्त किया
Received
Indian Bureau of Mines
Regional Office-GOA

FORM D-1

(Notice of temporary discontinuance of mine)

[see rule 24]

1 (i) Name of the mineral worked: Mn Ore

(ii) Name of other mineral worked, if any:

2. Name of the mine: Zambulidadga Dongor Mine

3. Name and address of the Lessee/Owner: Kala Kirtani
'Mathura'
House No. 1153,
Near Apna Bazar,
Aquem Alto, Margao - Goa

4. Particulars of Mining Lease (ML) 3/Fe/Mn/79
(i) Date of Execution: 28/06/1979

(ii) Period Years, from .. _____ to .. _____

(iii) Area under lease 70.28 hectares.

5. Location of Mine
(a) Village: Cavorem
(b) Post Office: Quepem
(c) District: South Goa
(d) State: Goa

6 Name and address of Agent:

7. Name and address of Mining Engineer. -

8. Date of temporary discontinuance: 01.08.2006

9. Reasons for temporary discontinuance:

i)	Lack of demand	-
ii)	Non-availability of labour	-
iii)	Rains	-
iv)	Transport bottleneck	-
v)	Strike / Lockout	-
vi)	Operations becoming un-economic	-
vii)	Other Reasons (Specify)	In view of Permissions/ approvals required under Forest Conservation Act and Environment Protection Act

Place: Margao
Date: 02.08.2006

Kala Narayana Kirtany

Kala Kirtani

ANNEXURE No. 5

गोवा GOA

Serial No. 3929 Place of Vendor MARGAO Date: 2/12/2020 583852

Value of Stamp Paper 500/-

Name of Purchaser

Residence Name of Father

Purpose Transacting Parties

As there is no one single paper for the value of Rs 500/- Additional stamp papers for the completion of the value are attached along with.

Stamp Vendor's Sign.
Mrs SALONI S. KOLWALKAR
Lic No JUD/VEN-LIC/1/2016/AC-I
Margao-Goa

Signature of Purchaser

NOTARY N. R. DALE MARGAO GOA (INDIA)

GENERAL POWER OF ATTORNEY

Kala Varuna Kartany

Priya Prasad Navelkar

Cano

BY THESE PRESENTS WE:

'NARAINA S. QUIRTONIM MINES', an Association of Persons constituted under a Deed executed on 1st day of February, 2021, represented herein by the following members,

1. **Mrs. Kala Naraina Kirtani alias Kala Naraina Quirtonim**, widow of Naraina Sinai Quirtonim, age 82 years, House Wife (occupation), residing at Aquem – Alto, Margao, holding Aadhar Card No. 6949 1945 2441 and allotted Permanent Account No. AFMPK3941B by the Income Tax Department,
2. **Mrs. Priya Prasad Navelkar,** daughter of Naraina Sinai Quirtonim, age 45 years, Business (occupation), residing at Navelim-Margao, holding Aadhar Card No. 8960 7460 5858 and allotted Permanent Account No. AGCPN8495N by the Income Tax Department,
3. **Mr. Prasad Premanand Navelkar,** son of Mr. Premanand Navelkar, age 51 years, Business (occupation), residing at Navelim-Margao, holding Aadhaar Card No. 2563 0915 2491, allotted Permanent Account No. ACCPN7884K by the Income Tax Department,
4. **Mr. Zoivant Mhalu Poi Cano,** son of Mhalu Poi Cano, age 52 years, Business (occupation), residing at Navelim-Margao, holding Aadhar Card No. 4639 7517 9381 and allotted Permanent Account No. ACAPP6617L by the Income Tax Department,

DO HEREBY SENT GREETINGS:

WHEREAS:

1. This Association of Persons comprises of five constituent members, viz. (1) Mrs. Kala Naraina Kirtani alias Kala Naraina Quirtonim,

Kala Naraina Kirtany
Priya Prasad Navelkar
Cano

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(2)Mrs. Priya Prasad Navelkar (3) Mr. Prasad Premanand Navelkar (4) Mrs. Pradnya Zoivant Poi Cano and (5) Mr. Zoivant Mhalu Poi Cano hereinafter referred to as the ***"Said AOP"***).

2. There exists a mining concession/mining lease which was granted to late Naraina Sinai Quirtonim known as "Zambhdadge Dongor" bearing No.3/Pe-Mn/1979, situated at Cavrem Village, Quepem Taluka, which was granted on 13/12/1979 to Mr. Naraina Sinai Quirtonim (hereafter ***'Said Mine or 'Said Mining Lease'***).

3. The Said AOP has been constituted to run the mining business and carry on mining activities in respect of the Said Mine and to sell the mineral ore from the Said Mine and to earn income/profits therefrom by joint and common enterprise;

4. In order to carry on the day-to-day activities concerning the working of Said Mine and all/any other business transactions/activities concerning the Said Mine, we are desirous of appointing, nominating and constituting one of the constituent members of the Said AOP, viz. **MRS. PRADNYA ZOIVANT POI CANO**, to be the Said AOP's true and lawful attorney and to do the following acts, deeds, matters and things in the name and on behalf of the Said AOP, viz.

I. **NOW KNOW YOU ALL AND THESE PRESENTS WITNESS** that we do hereby appoint and constitute one of the constituent member of the Said AOP, viz. **MRS. PRADNYA ZOIVANT POI CANO**, daughter of late Naraina Sinai Quirtonim, aged 42 years, Indian National, holding

Kala Naraina Kirtany
Priya Prasad Navelkar
P. Cano
P. Cano

Aadhaar Card No. 2470 2564 7014, allotted Permanent Account No. ASYPP2866P by the Income Tax Department, and residing at House No. 600, Bhawani Sadan, Navelim, Salcete, Goa, as our Attorney or Agent (hereinafter referred to as ***"our Attorney"***), with full authority and powers, to do and execute all the following acts, Deeds and things in name of the Said AOP and on behalf of the Said AOP, in all matters arising out of and/or in connection with and/or in relation to and/or concerning and/or howsoever touching the Said Mine / Said Mining Lease, viz.

1. To represent the Said AOP and to appear on behalf of the Said AOP before all statutory, administrative, quasi-judicial and judicial authorities.

2. To file applications, petitions, appeals, administrative, quasi-judicial or judicial proceedings.

3. To engage advocates and other professionals.

4. To appear and represent the Said AOP before any local authority, State Government, Central Government or any other authorities or Departments of the State or Government of India for obtaining permits, sanctions, licenses, authorizations or otherwise as may be necessary including for the payment of all statutory dues, royalty, cess, dead rent, surface rent, District Mineral Fund, National Mineral Exploration Trust and Goa Permanent Iron Fund, sales tax,

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Priya Prasad Navelkar

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GST, income tax or any other dues to the Government and local authorities in respect of the Said Mine.

5. To sign and submit applications, forms, returns, declarations or any other papers for obtaining necessary licenses, permits, approvals, etc., and perform such other formalities as required under the provisions of various applicable rules but not limited to the Mines Act, 1952; The Mines & Minerals (Regulation and Development) Act 1957, Mineral Conservation and Development Rules 2017, Mineral (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules 2016, Forest Conservation Act, 1980, Environment Protection Laws and other allied laws applicable laws in force.

6. To commence, to file caveat, file, institute, conduct, defend, oppose, continue, resist, abandon, adjust, settle, compromise, to file consent terms, withdraw, compound all or any of the claims, demands, disputes and matters which may subsist or arise between the Said AOP and any other person or persons or entity in any courts in India, i.e. Civil, Criminal or Revenue, Appellate or Revisional, High Court or Supreme Court of India, etc., or any other proceedings and to execute and perform all acts, deeds and things in any such legal proceedings, which said proceedings whether may be pending or which may be required to be pending or which may be required to be filed by the Said AOP or any of the Said AOP in future, on behalf of the Said AOP and/ or before other Government Authorities, i.e. Central and/or State and to prefer Appeal, Revision, file special Leave Petition (s)or leave petition (s) against any Judgments/orders that may be passed in above matter

Kala Narsina Kirtany
Priya Prasad Navelkar

before High Court or Supreme Court or any other appropriate Court of law as and when so advised/ required.

7. To accept service of summons, notices, and writs of any court, civil, criminal or revenue, original appellate revisional, High Court or Supreme Court in which all actions, suits, information, complaints, that is or any be had, brought, commenced or prosecuted by or against the Said AOP wherein the Said AOP shall be advised or think proper and for that purpose to declare and affirm all Plaints, Written Statements, Applications, Petitions including Special Leave Petitions, Affidavits, Memorandum of Appeal and/or other documents and/or instruments in writing in our name and on behalf of the Said AOP as may be necessary and if necessary, to appear before any Court including High Court or Supreme Court, Judge, Magistrate, Mamlatdar, Collector, Revenue, Tenancy or any other officer/s empowered by law to hear any suit, Petition or Proceedings in such legal proceeding and to give evidence/ to depose and/or give statement on oath, to file Affidavit-in-Evidence in connection with the above matter, as also to execute any bond or to give any undertakings before any court or authority as and when deemed necessary and generally to do all such acts that may be necessary for the efficient prosecution or defense of the cases.

8. To sign, execute, verify, file, withdraw, receive, any letters, correspondence, to sign invoice, applications, receipts, plans, forms, returns, documents, commitments, petitions, on behalf of the Said AOP as may in the opinion of our Attorney be necessary or convenient or expedient.

Kala Narmina Kistary
Priya Prasad Navelkar

9. To engage, appoint, retain, advocate, solicitors, Chartered Accountants, Valuers, assessors, other professionals and for that purpose to sign, issue any appointment letters, engagement letters, Vakalatnamas, letters of authority, etc., and to revoke such appointments and to settle and pay their fees.

10. To commence, file, institute, complaints, etc. criminal and/or civil before all Police authorities, as and when so advised/ required on behalf of the Said AOP and to resist, abandon, adjust, settle, compromise, withdraw, compound the same and/or to take such other and further appropriate legal steps in relation thereto as and when so advised/ required.

11. In particular, to sign, execute, affirm, all the papers, applications, i.e. Application for Renewal/grant of the Mining Lease, application for Revision before Central Government under all applicable provisions of law and all other paper (s), application (s),affidavit (s), petition(s),deed(s), lease deed(s) or any other forms or deeds as required under the provisions of all applicable laws in force at the relevant time as may be required.

12. To commence, file, pursue proceeding for recovery, refund of statutory or any other dues before the State /Central Government and/or competent authorities.

Kala Narain Kirtany
Priya Prasad Navelkar

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13. To receive and pay, refund amounts so received by the Said AOP from the statutory authorities, State Government , Central Government and/or any other competent authority as agreed between the Said AOP.

14. To deal with purchasers of ore from the Said Mine, contractors and other persons and agencies concerned with the working of the Said Mine, with whom the Said AOP and/or its constituent members have entered into or may enter into, agreements and to represent the Said AOP with such purchasers, contracts and other persons and agencies in all matters related to the said agreements entered into by the Said AOP and the Other Heirs with such persons.

15. And for more effectually doing effective and performing the several matters and things aforesaid to appoint from time to time or generally, such person or persons as our Attorney thinks fit as his substitute or substitutes, to do, execute and perform all or any such matters and thing as aforesaid and to remove any such substitute or substitutes at the pleasure and to appoint another or others in his or their place and we hereby agree at all times to ratify and confirm whatsoever our Attorney or any such substitute, substitutes shall lawfully do or cause to be done in our about the premises.

16. And also for more effectually removing any doubts which may arise as to the true meaning of these presents or as to the construction or application of the powers hereby declare that the powers hereby given by the Said AOP to my said our Attorney or be deemed

Kala Narsina Kirtany
Priya Prasad Navelkar

limited to such transactions and matters not herein precisely mentioned or defined which in the due course may by the said our Attorney be deemed to be requisite or expedient to be done or performed.

II. **AND WE DECLARE THAT:**

1. This General Power of our Attorney is revocable.
2. All acts, deeds and things done by our Attorney shall be construed as acts, deeds and things done by the Said AOP and the Said AOP agrees to ratify and be bound by all acts lawfully done by our Attorney by virtue of the powers hereby given.

III. **AND WE DO HEREBY IDENTIFY AND ATTEST** the photograph and signature of our Attorney which appears at the foot of this indenture.

IN WITNESS WHEREOF, we have executed this General Power of our Attorney on this 2nd day of February, 2021at Margao - Goa.

EXECUTANTS

Kala Naraina Kirtany

Kala Naraina Kirtani alias Kala Naraina Quirtonim

Priya Prasaad Navelkar

Cano

Cano

Priya Prasad Navelkar.

Priya Prasad Navelkar

Prasad Premanand Navelkar

Zoivant Mhalu Poi Cano

SIGNED AND EXECUTED BY OUR ATTORNEY:

Kaka Narsina Kirtany

Cano

Cano

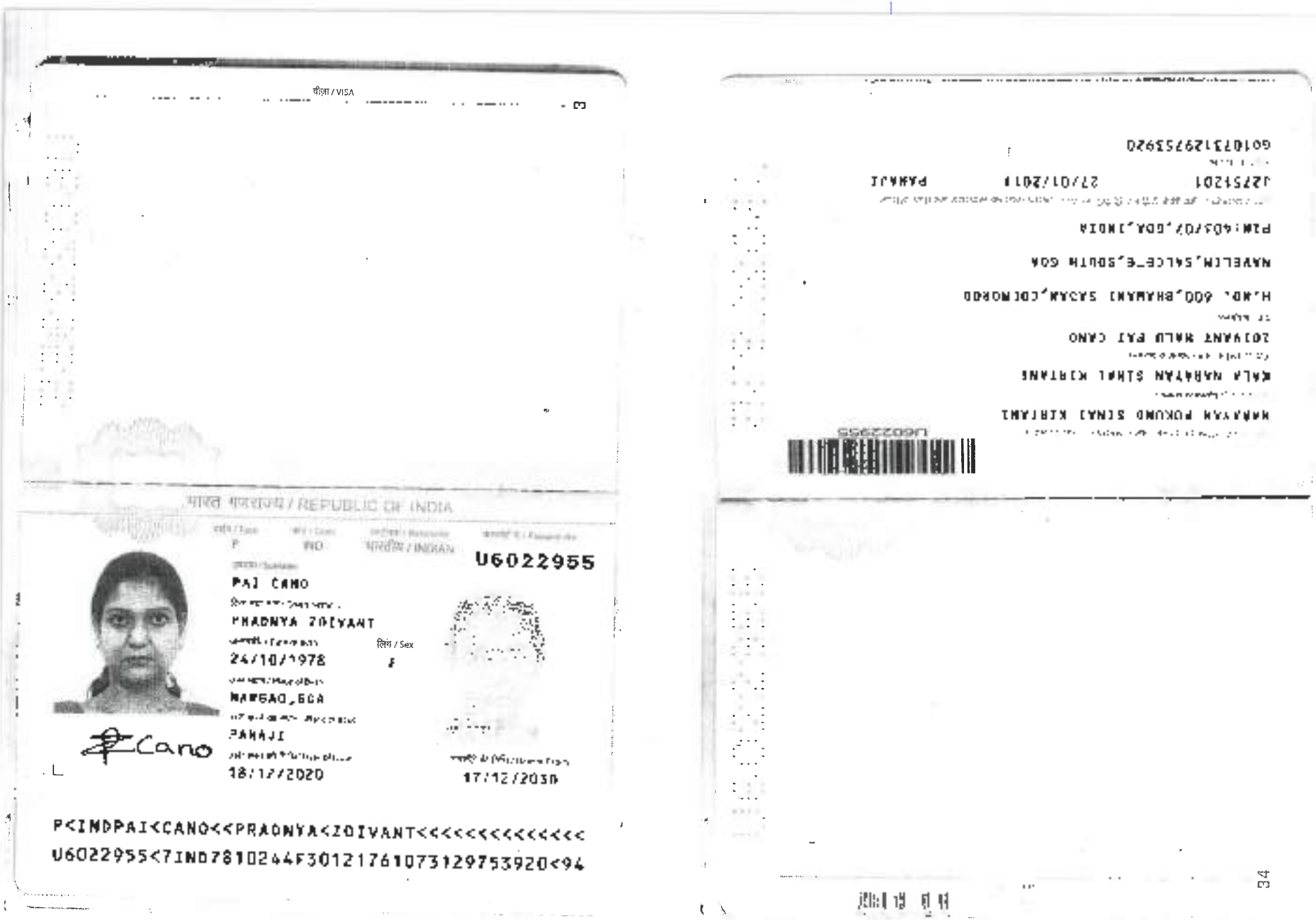
Cano

Pradnya Zoivant Poi Cano

Kala Narcina Kirtany

Priya Prasaad Navelkar

Cano



वीज़ा / VISA

भारत गणराज्य / REPUBLIC OF INDIA

P IND भारतीय / INDIAN U6022955

PAI CANO

PRADNYA ZOIVANT

24/10/1978 लिंग / Sex F

MARGAO, GOA

PANAJI

18/12/2020 17/12/2030

P<INDPAI<CANO<<PRADNYA<ZOIVANT<<<<<<<<<<<<<<

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Cano

U6022955

MARAYAN PUKUMO SINAI KIRTANI

KALA NARAYAN SUHAL KIRTANE

ZOIVANT MALU PAI CANO

H.NO. 600,BHAWANI SADAN,COLMORAD

NAVELIM,SALCETE,SOUTH GOA

PIN:403707,GOA,INDIA

J2751201 27/01/2014 PANAJI

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ANNEXURE No. 6

भारत सरकार

आधार

भारतीय विशिष्ट पहचान प्राधिकरण

भारत सरकार

Unique Identification Authority of India

Government of India

Enrollment No.: 0649/10060035102

To

Pradnya Zovani Pai Cano

W/O Zovan. Mak. Pai Cano

Near Sitara Bajaj H no 600 Bhawani Sadan Colmorod

Navelim

Navelim

South Goa

Goa 403707

9850534080

1708/2012

825228E5

MH625228E55FH

आपका आधार क्रमांक / Your Aadhaar No. :

2470 2564 7014

मेरा आधार, मेरी पहचान

भारत सरकार

Government of India

Pradnya Zovani Pai Cano

DOB : 24/12/1978

Female

2470 2564 7014

मेरा आधार, मेरी पहचान

P. Cano

GOA UNIVERSITY

2006 - 0113

This is to certify that

Fernandes Roshel Maria

daughter of

Shri Capistron Fernandes

and

Smt. Violante Fernandes

has been awarded the degree

Master of Science

of this University having passed
the qualifying examination held in April, 2006
in Geology
with Grade A+

Given under the seal of the University

Panaji

Date : 14th January, 2007

Vice-Chancellor

FOMENTO

Ref.: P&A /CERT/011618 October 25, 2016

CERTIFICATE

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Ms. Roshel Fernandes is working in Sociedade de Fomento Industrial Pvt. Ltd as "Assistant Manager - Geology" since June 26, 2006 till date.

She has professional experience in the Mining & Geology. This Certificate is issued at the request of the individual to produce in the Indian Bureau of Mines. Issuance of this certificate doesn't confer any financial and legal liabilities to the issue.

For and on behalf of

SOCIEADE DE FOMENTO INDL. PVT. LTD

AUTHORISED SIGNATORY

SOCIEDADE DE FOMENTO INDUSTRIAL PVT. LTD. P.B. 31 Margao Goa 403601

SOCIEDADE DE FOMENTO INDUSTRIAL PVT. LTD., Vila Flores da Silva, Erasmo Carvalho Street, Post Box 31, Margao, Goa - 403 601, India.
Tel: (91-832) 2720700 Fax: (91-832) 2730551 E-mail: fomento@fomento.com
CIN-U31200GA1967PTC000075

BOREHOLE LOGSHEETS

BORING INFORMATION ON Kotangi MINE

Bore Hole No:	KR-1	Unit:	274	Date	19/2/05
Location:		Co-ordinates:		Total Meterage	17 mts
Collar Level:					

Sr No	Drilling Meterage From	Drilling Meterage To	Lithology	Colour Code	Analysis Report Fe	Analysis Report SiO2	Analysis Report Al2O3	Analysis Report FeO
1	0	1	Laterite					
2	1	2	Lumpy ore		58.7			
3	2	3	Laterite + Lumpy		57.9			
4	3	4	Lumpy ore + lat		56.5			
5	4	5	Low grade lore		60.2			
6	5	6	"		63.3			
7	6	7	"		61.5			
8	7	8	[illegible] clay + [illegible]		54.9			
9	8	9	[illegible] Clay		41.3			
10	9	10	L.G. lore		57.9			
11	10	11	"		55.7	56.39 Fe		
12	11	12	Yellow clay [illegible]		47.2	[illegible]		
13	12	13	"					
14	13	14	"					
15	14	15	"					
16	15	16	"					
17	16	17	"					
18	17	18						
19	18	19						
20	19	20						
21	20	21						
22	21	22						
23	22	23						
24	23	24						
25	24	25						
26	25	26						
27	26	27						
28	27	28						
29	28	29						
30	29	30						
31	30	31						
32	31	32						
33	32	33						
34	33	34						
35	34	35						
36	35	36						
37	36	37						
38	37	38						

(Roshel Fernandes)
Qualified Person

BORING INFORMATION ON Kotaway's MINE

Bore Hole No:	KR-2	Unit:	WTH	Date	19/3/05
Location:		Co-ordinates:			
Collar Level:	[illegible]			Total Meterage:	27 mts

Sr No	Drilling Meterage		Lithology	Colour Code	Analysis Report			
	From	To			Fe	SiO2	Al2O3	FeO
1	0	1	Reddish brown Laterite					
2	1	2	"					
3	2	3	"					
4	3	4	"					
5	4	5	"					
6	5	6	"					
7	6	7	"					
8	7	8	"					
9	8	9	"					
10	9	10	"					
11	10	11	Reddish P. ore+lat		55.7			
12	11	12	"		60.3			
13	12	13	"		58.7			
14	13	14	"		65.5			
15	14	15	"		59.3			
16	15	16	Yellowish P. ore		58.9			
17	16	17	"		63.8			
18	17	18	"		61.3			
19	18	19	"		61.8			
20	19	20	"		66.9			
21	20	21	"		67.5			
22	21	22	"		63.7			
23	22	23	Blkish P. ore		66.2			
24	23	24	"		63.3			
25	24	25	Lim. P. ore		63.0			
26	25	26	"		59.0			
27	26	27	"					
28	27	28			[illegible] 62.18% Fe			
29	28	29						
30	29	30						
31	30	31						
32	31	32						
33	32	33						
34	33	34						
35	34	35						
36	35	36						
37	36	37						
38	37	38						

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Qualified Person

BORING INFORMATION ON [illegible] MINE

Bore Hole No:	KR-4	Unit:	[illegible]	Date	8/3/05
Location:		Co-ordinates:		Total Meterage:	30 mts
Collar Level:					

Sr No	Drilling Meterage From	Drilling Meterage To	Lithology	Colour Code	Analysis Report Fe	SiO2	Al2O3	FeO
1	0	1	Reddish Laterite					
2	1	2	"					
3	2	3	"					
4	3	4	"					
5	4	5	"					
6	5	6	Reddish L. ore		54.8			
7	6	7	"		57.5			
8	7	8	"		57.7			
9	8	9	"		53.7			
10	9	10	"		54.7			
11	10	11	"		51.3			
12	11	12	Lim. brown L. ore		49.3			
13	12	13	"		42.7			
14	13	14	"		49.7			
15	14	15	"		47.5			
16	15	16	Brownish L. ore		57.3			
17	16	17	"		62.0			
18	17	18	"		62.3			
19	18	19	"		60.5			
20	19	20	"		60.5			
21	20	21	"		63.8			
22	21	22	Limonitic L. ore		58.7			
23	22	23	"		60.5			
24	23	24	"		58.8			
25	24	25	"		57.80	[illegible] 60.62		
26	25	26	Whitish shale and clay					
27	26	27	"					
28	27	28	"					
29	28	29	"					
30	29	30	"					
31	30	31						
32	31	32						
33	32	33						
34	33	34						
35	34	35						
36	35	36						
37	36	37						

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BORING INFORMATION ON Kotanyls MINE

Bore Hole No:	KR-7	Unit:	DTH	Date	9/4/05
Location:		Co-ordinates:		Total Meterage:	32 mts
Collar Level:					

Sr No	Drilling Meterage From	To	Lithology	Colour Code	Analysis Report Fe	SiO2	Al2O3	FeO
1	0	1	Reddish Laterite					
2	1	2	"					
3	2	3	"					
4	3	4	"					
5	4	5	"					
6	5	6	"					
7	6	7	"					
8	7	8	"					
9	8	9	"					
10	9	10	"					
11	10	11	"					
12	11	12	"					
13	12	13	"					
14	13	14	"					
15	14	15	"					
16	15	16	Reddish L.G. ore					
17	16	17	"		55.4	2.5	13.83	
18	17	18	"					
19	18	19	"					
20	19	20	Brownish L. ore					
21	20	21	"		58.6	2.9	9.17	
22	21	22	"					
23	22	23	"					
24	23	24	Yellowish L. ore					
25	24	25	"		61.5	2.5	5.68	
26	25	26	"					
27	26	27	Brown L. ore					
28	27	28	"					
29	28	29	"					
30	29	30	"		60.0	1.7	6.85	
31	30	31	"					
32	31	32	"					
33	32	33						
34	33	34						
35	34	35						
36	35	36						
37	36	37						
38	37	38						

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BORING INFORMATION ON Kitay's MINE

Bore Hole No: KR-8 | Unit: DTA | Date

Location: | Co-ordinates: | Total Meterage: 86 mts

Collar Level:

Sr No	Drilling Meterage From	To	Lithology	Colour Code	Analysis Report Fe	SiO2	Al2O3	FeO
1	0	1	Red Laterite					
2	1	2	"					
3	2	3	"					
4	3	4	"					
5	4	5	"					
6	5	6	"					
7	6	7	"					
8	7	8	"					
9	8	9	"					
10	9	10	"					
11	10	11	"					
12	11	12	Ferruginous Laterite		48-6			
13	12	13	"					
14	13	14	"					
15	14	15	Red Ml. Clayey		52-3			
16	15	16	"					
17	16	17	"					
18	17	18	Brown Yellow Ore		58-3			
19	18	19	"					
20	19	20	Brownish Red Ore					
21	20	21	"		58-1			
22	21	22	"					
23	22	23	Laterite Clay + Iron Ore					
24	23	24	"		55-0			
25	24	25	"					
26	25	26	"					
27	26	27						
28	27	28						
29	28	29						
30	29	30						
31	30	31						
32	31	32						
33	32	33						
34	33	34						
35	34	35						
36	35	36						
37	36	37						
38	37	38						
39	38	39						

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Qualified Person

BORING INFORMATION ON Kirtany's MINE

Bore Hole No:	KR-10		Unit:	DTH	Date		10/4/05
Location:			Co-ordinates:				
Collar Level:					Total Meterage:		35 mts

Sr No	Drilling Meterage		Lithology	Colour Code	Analysis Report			
	From	To			Fe_t	SiO_2	Al_2O_3	FeO
1	0	1	Reddish Laterite					
2	1	2	"					
3	2	3	"					
4	3	4	"					
5	4	5	"					
6	5	6	"					
7	6	7	"					
8	7	8	"					
9	8	9	"					
10	9	10	"					
11	10	11	"					
12	11	12	"					
13	12	13	"					
14	13	14	"					
15	14	15	"					
16	15	16	"					
17	16	17	"					
18	17	18	"					
19	18	19	Laterite with lumps		52.5			
20	19	20	"					
21	20	21	Reddish brown Ore		57.6			
22	21	22	"					
23	22	23	Brownish Ore					
24	23	24	"					
25	24	25	"		62.6			
26	25	26	"					
27	26	27	"					
28	27	28	"					
29	28	29	"		60.9			
30	29	30	"					
31	30	31	"		62.9			
32	31	32	"					
33	32	33	Yellowish Ore					
34	33	34	"		59.0			
35	34	35	"					
36	35	36						
37	36	37						

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Qualified Person

BORING INFORMATION ON Korlay's MINE

Bore Hole No:	KRH3	Unit:	DTH	Date	15/4/05
Location:		Co-ordinates:		Total Meterage:	50 mts
Collar Level:					

Sr No	Drilling Meterage From	To	Lithology	Colour Code	Analysis Report Fe%	SiO2	Al2O3	FeO
1	0	1	Red&M Laterite					
2	1	2	"					
3	2	3	"					
4	3	4	"					
5	4	5	"					
6	5	6	"					
7	6	7	"					
8	7	8	"					
9	8	9	"					
10	9	10	"					
11	10	11	"					
12	11	12	"					
13	12	13	Red&Mot. ore					
14	13	14	"					
15	14	15	"					
16	15	16	Brownish Red					
17	16	17	"					
18	17	18	"		56-3			
19	18	19	"					
20	19	20	"					
21	20	21	"					
22	21	22	Brownish P. ore					
23	22	23	"					
24	23	24	"		59-2			
25	24	25	"					
26	25	26	"					
27	26	27	"					
28	27	28	Brownish L.G. Ore					
29	28	29	"		58-1			
30	29	30	"					
31	30	31	"					
32	31	32						
33	32	33						
34	33	34						
35	34	35						
36	35	36						
37	36	37						
38	37	38						

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Qualified Person

BORING INFORMATION ON Kirtany MINE

Bore Hole No:	KR-15	Unit:	M	Date	16/1/07
Location:		Co-ordinates:		Total Meterage:	30 mts
Collar Level:					

Sr No	Drilling Meterage From	To	Lithology	Colour Code	Analysis Report Fe	SiO2	Al2O3	FeO
1	0	1	Brown Laterite					
2	1	2	"					
3	2	3	"					
4	3	4	"					
5	4	5	"					
6	5	6	Reddish Ferr. Lat					
7	6	7	" Lat					
8	7	8	"					
9	8	9	"					
10	9	10	"					
11	10	11	"					
12	11	12	Yellowish Laterite Clay					
13	12	13	"					
14	13	14	"					
15	14	15	Reddish Lat clay					
16	15	16	"					
17	16	17	" + ore					
18	17	18	Brownish Ore					
19	18	19	"					
20	19	20	"		58.2			
21	20	21	"					
22	21	22	"					
23	22	23	Blackish shale					
24	23	24	"					
25	24	25	Brown L.G. Ore		56.6			
26	25	26	"					
27	26	27	Brownish Ore					
28	27	28	"					
29	28	29	"		60.7			
30	29	30	"					
31	30	31	"					
32	31	32						
33	32	33						
34	33	34						
35	34	35						
36	35	36						
37	36	37						
38	37	38						

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ZAMBLIDADGA DONGOR IRON AND MANGANESE ORE MINE

BOREHOLE No.	:	KR-05	TYPE OF BOREHOLE		:	DTH
GROUND LEVEL	:	232.0m	TOTAL DEPTH		:	31 m
NORTHING	:	1673213.993	DATE	START	:	2005
EASTING	:	400453.7591		CLOSE	:	2005

DEPTH		THICKNESS	DESCRIPTION
From	To		
0	1	1	Laterite
1	2	1	
2	3	1	
3	4	1	
4	5	1	
5	6	1	
6	7	1	Powdery ore
7	8	1	
8	9	1	
9	10	1	
10	11	1	
11	12	1	
12	13	1	
13	14	1	
14	15	1	
15	16	1	
16	17	1	
17	18	1	
18	19	1	
19	20	1	
20	21	1	
21	22	1	
22	23	1	
23	24	1	
24	25	1	
25	26	1	
26	27	1	Phyllite
27	28	1	
28	29	1	
29	30	1	
30	31	1	

Bore Hole closed at the depth of 31 m.

Note : Borehole Reproduced from Approved Mining Scheme

(Roshel Fernandes)
Qualified Person

ZAMBLIDADGA DONGOR IRON AND MANGANESE ORE MINE

BOREHOLE No.	:	KR-11	TYPE OF BOREHOLE		:	DTH
GROUND LEVEL	:	288.0 m	TOTAL DEPTH		:	35 m
NORTHING	:	1673210.188	DATE	START	:	2005
EASTING	:	400035.8961		CLOSE	:	2005

DEPTH		THICKNESS	DESCRIPTION
From	To		
0	1	1	Laterite
1	2	1	
2	3	1	
3	4	1	
4	5	1	
5	6	1	
6	7	1	
7	8	1	
8	9	1	
9	10	1	Powdery ore
10	11	1	
11	12	1	
12	13	1	
13	14	1	
14	15	1	
15	16	1	
16	17	1	
17	18	1	
18	19	1	
19	20	1	
20	21	1	
21	22	1	
22	23	1	
23	24	1	
24	25	1	
25	26	1	
26	27	1	
27	28	1	
28	29	1	
29	30	1	
30	31	1	
31	32	1	
32	33	1	
33	34	1	
34	35	1	

Bore Hole closed at the depth of 35 m.

Note : Borehole Reproduced from Approved Mining Scheme

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ZAMBLIDADGA DONGOR IRON AND MANGANESE ORE MINE

BOREHOLE No.	:	KR-12	TYPE OF BOREHOLE	:	DTH
GROUND LEVEL	:	247.0 m	TOTAL DEPTH	:	37 m
NORTHING	:	1673172.17	DATE START	:	2005
EASTING	:	400354.8926	CLOSE	:	2005

DEPTH		THICKNESS	DESCRIPTION
From	To		
0	1	1	Laterite
1	2	1	
2	3	1	
3	4	1	
4	5	1	
5	6	1	
6	7	1	
7	8	1	
8	9	1	
9	10	1	
10	11	1	Powdery ore
11	12	1	
12	13	1	
13	14	1	
14	15	1	
15	16	1	
16	17	1	
17	18	1	
18	19	1	
19	20	1	
20	21	1	
21	22	1	
22	23	1	
23	24	1	
24	25	1	
25	26	1	
26	27	1	
27	28	1	
28	29	1	
29	30	1	
30	31	1	
31	32	1	
32	33	1	
33	34	1	
34	35	1	
35	36	1	
36	37	1	

Bore Hole closed at the depth of 37 m.

Note : Borehole Reproduced from Approved Mining Scheme

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ZAMBLIDADGA DONGOR IRON AND MANGANESE ORE MINE

BOREHOLE No.	:	KR-16	TYPE OF BOREHOLE		:	DTH
GROUND LEVEL	:	293.0m	TOTAL DEPTH		:	42 m
NORTHING	:	1673214.14	DATE	START	:	2005
EASTING	:	399945.044		CLOSE	:	2005

DEPTH		THICKNESS	DESCRIPTION
From	To		
0	1	1	Laterite
1	2	1	
2	3	1	
3	4	1	
4	5	1	
5	6	1	
6	7	1	
7	8	1	
8	9	1	
9	10	1	
10	11	1	
11	12	1	
12	13	1	
13	14	1	
14	15	1	Powdery ore
15	16	1	
16	17	1	
17	18	1	
18	19	1	
19	20	1	
20	21	1	
21	22	1	
22	23	1	
23	24	1	
24	25	1	
25	26	1	
26	27	1	
27	28	1	
28	29	1	
29	30	1	
30	31	1	
31	32	1	
32	33	1	
33	34	1	
34	35	1	
35	36	1	
36	37	1	
37	38	1	
38	39	1	
39	40	1	
40	41	1	
41	42	1	

Bore Hole closed at the depth of 42 m.

Note : Borehole Reproduced from Approved Mining Scheme

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ZAMBLIDADGA DONGOR IRON AND MANGANESE ORE MINE

BOREHOLE No.	:	KR-17	TYPE OF BOREHOLE		:	DTH
GROUND LEVEL	:	302.0 m	TOTAL DEPTH		:	39 m
NORTHING	:	1673351.806	DATE	START	:	2005
EASTING	:	399921.9701		CLOSE	:	2005

DEPTH		THICKNESS	DESCRIPTION
From	To		
0	1	1	Laterite
1	2	1	
2	3	1	
3	4	1	
4	5	1	
5	6	1	
6	7	1	
7	8	1	
8	9	1	
9	10	1	
10	11	1	
11	12	1	
12	13	1	Laterite Mixed with Mn Ore
13	14	1	
14	15	1	
15	16	1	
16	17	1	
17	18	1	
18	19	1	
19	20	1	Clays
20	21	1	
21	22	1	
22	23	1	
23	24	1	
24	25	1	
25	26	1	
26	27	1	
27	28	1	
28	29	1	
29	30	1	
30	31	1	
31	32	1	
32	33	1	
33	34	1	
34	35	1	
35	36	1	
36	37	1	
37	38	1	
38	39	1	

Bore Hole closed at the depth of 39 m.

Note : Borehole Reproduced from Approved Mining Scheme

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ZAMBLIDADGA DONGOR IRON AND MANGANESE ORE MINE

BOREHOLE No.	:	KR-18	TYPE OF BOREHOLE		:	DTH
GROUND LEVEL	:	236	TOTAL DEPTH		:	20 m
NORTHING	:	1673177.09	DATE	START	:	27-06-2005
EASTING	:	400466.7361		CLOSE	:	27-06-2005

DEPTH		THICKNESS	DESCRIPTION
From	To		
0	1	1	Laterite
1	2	1	
2	3	1	
3	4	1	
4	5	1	
5	6	1	
6	7	1	
7	8	1	
8	9	1	
9	10	1	
10	11	1	Powdery ore
11	12	1	
12	13	1	
13	14	1	
14	15	1	
15	16	1	
16	17	1	
17	18	1	
18	19	1	
19	20	1	

Bore Hole closed at the depth of 20 m.

Note : Borehole Reproduced from Approved Mining Scheme

(Roshel Fernandes)
Qualified Person

Cimla Laboratories Pvt. Ltd.

CHEMICAL ANALYSIS & CONSULTANTS

Date: 30/11/2021

CERTIFICATE OF ANALYSIS

PARTICULARS OF SAMPLE: IRON ORE

Mine Name: Zamblidadga Dongor Iron and Manganese ore Mine (M.L. No. 03/Fe-Mn/79)

Lessee: Mrs Pradnya Z.Cano (For self and on behalf of all other Heirs of Late Shri Naraina Sinai Quirtonim as their duly constituted Attorney).

Lessee Address: H.No. 1153, Mathura,Near St.Joseph High School,Aquem, Alto-Margao,Goa-403601.

Samples Drawn by: Lessee

Test Report No.: CLPL/001/2021-22

Analysis of Result

Sr No	Sample Mark	Date of sampling	Fe%	Al_2O_3%	SiO_2%	Mn%
1	S-1	10-11-2021	54.10	12.38	1.45	0.27
2	S-2		44.80	17.87	4.70	0.29
3	S-3		52.50	11.84	3.65	0.41
4	S-4		53.20	11.75	1.85	0.36
5	S-5		45.90	16.68	3.95	0.32
6	S-6		48.60	16.00	3.85	0.23
7	S-7		53.80	12.90	1.60	0.21
8	S-8	11-11-2021	49.80	14.08	3.85	0.48
9	S-9		50.90	12.90	3.18	0.33
10	S-10		51.80	12.05	2.85	0.38
11	S-11		52.80	11.86	2.45	0.36
12	S-12		52.90	11.43	2.18	0.30
13	S-13		46.00	16.25	4.66	0.26
14	S-14		52.00	11.61	2.88	0.38
15	S-15		50.90	12.58	2.98	0.39
16	S-16	12-11-2021	49.70	16.43	3.85	0.37
17	S-17		47.80	16.57	3.95	0.31
18	S-18		51.00	12.61	3.68	0.27
19	S-19		49.90	15.36	4.32	0.46
20	S-20		52.30	11.03	2.78	0.28
21	S-21		48.40	16.42	3.65	0.46
22	S-22		51.00	11.80	3.32	0.38
23	S-23		50.80	12.77	3.55	0.35

NB: Samples analysed at Cuddegal Lab

The above test results relates only to the item tested

The test report shall not be reproduced, except in full, without the written permission of the laboratory.

Authorised Signatory

For Cimla Laboratories Pvt. Ltd.

Branch : Yeswantnagar, Sandur Taluka, Bellary District, Karnataka.
Registered Office : Post Box No. 329, Erasmo Carvalho Street, Margao, Goa 403 601.

Associates : ITALAB (JAPAN) LTD., TOKYO

Italab (GOA) PVT. Ltd.

INDUSTRIAL TESTING & ANALYTICAL LABORATORIES

Surveyors, Quality Inspectors & Analysts

Italab House, Opp. Carmelite Monastery, Apollo Victor Hospital Road, Malbhat, Margao, Goa 403 601

Tel: (Off.) (0832) 2739985, 2704883 /36 Fax: (0832) 2739955 Email: italab.goa@rediffmail.com • italabgoa@datsone.in Visit us at www.italabgoa.com

Sample submitted By Party Not Drawn By ITALAB

TEST REPORT

TEST REPORT NO.: P/GM/IT/74130 & 74131 **DATE:** 21.02.2022

NABL ULR NO.: TC807022200000203F & TC807022200000204F

***NAME AND ADDRESS OF THE CUSTOMER:** Naraina S Quirtonim Mines, C/o. Naraina S Quietonim Mines, 1153 Mathura Aquem South Goa, Near St. Joseph School, Margao, Goa.

SAMPLE PARTICULARS: Iron Ore (**Discipline:** Chemical - **Group:** Ores & Minerals)
(MATERIAL TO BE TESTED)

DATE OF RECEIPT: 19.02.2022 ***Letter No.:** NIL Dated 19.02.2022

NO. OF SAMPLE(S): 02(Two) **CONDITION OF SAMPLE(S):** Crushed Iron Ore samples.

***PARAMETER(S) TO BE TESTED:** Fe, SiO_2 & Al_2O_3.

TEST RESULTS :

Marks as stated by party: Mine Name: Zamblidadga Dongor Iron and Manganese ore Mine (M.L.No3/Fe-Mn/79)	**SAMPLE CODE (laboratory)**	Analysis on sample dried at 105°C		
		Iron Fe (%)	**Silica SiO_2 (%)**	**Alumina Al_2O_3 (%)**
S-1—Date of Sampling 10.11.2021	74130	54.00	1.50	12.12
S-2—Date of Sampling 11.11.2021	74131	48.02	3.91	16.74

*Indicates information supplied by the customer for which the laboratory has no control.

TESTED BY
(Chemist)

Authorized Signatory
(Deepali Shirwaikar -Chemist)

DIRECTOR

N.B.: 1) Sample analysed at Margao, Goa - Lab.
2) Analytical work started on 19.02.2022 - Completed on 21.02.2022
3) The above test result relates only to the item tested
4) This test report shall not be reproduced, except in full, without the written permission of the laboratory.

PAGE 1 OF 1

Associates : ITALAB (JAPAN) LTD., TOKYO

TC - 6070

Italab (GOA) PVT. Ltd.

INDUSTRIAL TESTING & ANALYTICAL LABORATORIES

Surveyors, Quality Inspectors & Analysts

Italab House, Opp. Carmelite Monastery, Apollo Victor Hospital Road, Malbhat, Margao, Goa 403 601

Tel: (Off.) (0832) 2739965, 2704883 /38 Fax: (0832) 2739955 Email: italab.goa@rediffmail.com • italabgoa@dataone.in Visit us at www.italabgoa.com

TEST REPORT

Sample submitted By Party Not Drawn By ITALAB

TEST REPORT NO.: P/GM/IT/74132
NABL ULR NO.: TC807022200000205F

DATE: 21.02.2022

***NAME AND ADDRESS OF THE CUSTOMER:** Naraina S Quirtonim Mines,
C/o. Naraina S Quietonim Mines, 1153 Mathura Aquem
South Goa, Near St. Joseph School, Margao, Goa

SAMPLE PARTICULARS: Manganese Ore (**Discipline:** Chemical - **Group:** Ores & Minerals)
(MATERIAL TO BE TESTED)

DATE OF RECEIPT: 19.02.2022 ***Letter No.:** NIL **Dated** 19.02.2022

NO. OF SAMPLE(S): 01(One) **CONDITION OF SAMPLE(S):** Crushed Manganese Ore sample.

***PARAMETER(S) TO BE TESTED:** Mn.

TEST RESULTS :

Marks as stated by party: Mine Name: Zamblidadga Dongor Iron and Manganese ore Mine (M.L.No3/Fe-Mn/79)	**SAMPLE CODE (laboratory)**	**Analysis on sample dried at 105°C**
		Manganese Mn (%)
S-1-Date of Sampling 10.11.2021	74132	30.32

*Indicates information supplied by the customer for which the laboratory has no control.

TESTED BY
(Chemist)

Authorized Signatory
(Deepali Shirwaikar -Chemist)

DIRECTOR

N.B.: 1) Sample analysed at Margao, Goa - Lab.
2) Analytical work started on 19.02.2022 - Completed on 21.02.2022
3) The above test result relates only to the item tested
4) This test report shall not be reproduced, except in full, without the written permission of the laboratory.

Cimla Laboratories Pvt. Ltd.

CHEMICAL ANALYSIS & CONSULTANTS

DATE: 09/03/2022

CERTIFICATE OF ANALYSIS

PARTICULARS OF SAMPLE: IRON ORE

Mine Name: Zoomblidoga Dongor Iron and Manganese ore Mine(M.L.No.3/Fe-Mn/79)

Lessee: Mrs Pradnya Z.Camu(For self and on behalf of all other Heirs of
Late Shri Naraina Sinai Quirtonim as their duly constituted Attorney).

Lessee Address: H.NO.1155, Marhora, Near St.Joseph High School, Aquem,Alto-Margao,Goa-403601

Sample Drawn by: Lessee.

Test Report No.: CLPL/022/2021-22

RESULTS OF ANALYSIS

CHEMICAL COMPOSITION (On Dry basis- Sample dried at 105°C)

Sr No	Sample Mark	Date of sampling	Fe%	FeO%	Al_2O_3%	SiO_2%	Mn%	P %	TiO2 %	LOI %
1	S-1	10-11-2021	54.30	0.015	12.22	1.46	0.30	0.036	0.046	8.57
2	S-2	11-11-2021	51.90	0.020	12.79	1.54	0.36	0.035	0.051	10.69
3	S-3	12-11-2021	48.40	0.025	16.54	2.61	0.44	0.059	0.055	10.04

NB. Samples analysed at Cuddegal Lab
The above test result is relates only to the item tested
The test report shall not be reproduced, except in full, without the written permission of the laboratory.

Authorised Signatory

For Cimla Laboratories Pvt. Ltd.

Branch : Yeswantnagar, Sandur Taluka, Bellary District, Karnataka
Registered Office : Post Box No. 329, Erasmo Carvalho Street, Margao, Goa 403 601

Cimla Laboratories Pvt. Ltd.

CHEMICAL ANALYSIS & CONSULTANTS

DATE : 09-03-2022

CERTIFICATE OF ANALYSIS

PARTICULARS OF SAMPLE: MANGANESE ORE

Mine Name: Zamblidaga Dongor Iron and Manganese ore Mine(M.L.No.3/Be-Mn/79)

Lessee:Mrs Pradnya Z.Cuny(For self and on behalf of all other Heirs of Late Shri Narsina Sinai Quirtonium as their duly constituted Attorney).

Lessee Address:H.NO.1153, Mathara, Near St.Joseph High School, Aquem,Alto-Margao,Goa-403601

Sample Drawn by: Lessee.

Test Report No.:CLPL/026/2021-22

RESULTS OF ANALYSIS

CHEMICAL COMPOSITION (On Dry basis- Sample dried at 105°C)

Sr No	Sample Mark	Date of sampling	Mn%	Fe%	SiO_2%	Al2O3 %	S %	P %	LOI %
1	M-1	10-11-2021	30.50	13.2	5.70	9.40	0.001	0.042	7.02
2	M-2	11-11-2021	28.75	16.70	8.68	11.42	0.003	0.058	7.40

NB: Samples analysed at Cuddegal Lab.

The above test results relates only to the item tested.

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Authorised Signatory

For Cimla Laboratories Pvt. Ltd.

SPECTRUM
ANALYTICAL SERVICES
An ISO 9001:2015 Certified company

Plot No. : 189
At - Kamanjoda (Behind HDFC Bank)
P.O. - Joda, Dist - Keonjhar
Odisha - 758034
Tel : +91 88950 88843
E-mail : spectrumjoda@gmail.com

TEST REPORT

FORM NO. – SAS/F-08

Date: 16 th February, 2022

Report No. : SAS/LAB/21-22/26

URL NO: TC936822000000004F

We hereby certify that 9 nos. of samples were submitted by M/s **Pradnya Zoivant Poi Cano** (Zamblidadga Dongor Iron & manganese Ore Mines) has been analyzed with the following results:

1. CUSTOMER NAME : M/s Pradnya Zoivant Poi Cano
2. ADDRESS : House no.1153, Mathura, Aquem, Alto Margao, Goa-403601
3. SERVICE REQUEST/ ORDER NO: SAS-161, SAS-162 & SAS-163
4. SAMPLE DESCRIPTION : Iron ore (03 samples),Lateritic Lumpy Iron Ore (03 samples)&Waste/Rejection (03 samples)
5. DATE OF SUBMISSION : 14/02/2022
6. TESTED ON : 15/02/2022
7. LOCATION OF TESTING : At Laboratory
8. CONDITION OF SAMPLE : Satisfactory & Adequate
9. BASIS OF TESTING : For Bulk density – (IS 5842 – 1986)

TC-9368

Sl. No	Test Parameters	Sample Type	Analysis Result			Average	Units	Test Method
			Sample-I	Sample-II	Sample-III			
1	Bulk Density	Iron Ore	2.75	2.78	2.87	2.80	Tonnes/M³	(IS 5842 – 1986
2		Waste/Rejection	1.95	2.07	1.98	2.00	Tonnes/M³	
3		Lateritic Lumpy Iron Ore	2.55	2.48	2.47	2.50	Tonnes/M³	

Note: 1.The report of analysis reflects LAB's findings at the time and place of Testing.
2. The results relate only to the sample tested.
3. Samples were drawn and submitted by the customer.

For Spectrum Analytical Services

Authorized by- Samir Kumar Das

Authorized Signatory

SPECTRUM ANALYTICAL SERVICES JODA

——END OF REPORT——

SPECTRUM
ANALYTICAL SERVICES
An ISO 9001:2015 Certified company

Plot No. : 189
At - Kamarjoda (Behind HDFC Bank)
P.O. - Joda, Dist - Keonjhar
Odisha - 758034
Tel : +91 88950 88843
E-mail : spectrumjoda@gmail.com

TEST REPORT

Date: 16 th February, 2022

Report No. : SAS/JDA/21-22/27/01

We hereby certify that 2 nos of Iron ore samples were submitted by M/s **Pradnya Zoivant Poi Cano** (Zamblidadga Dongor Iron & manganese Ore Mines) has been analyzed with the following results:

1. CUSTOMER NAME : M/s Pradnya Zoivant Poi Cano
2. ADDRESS : House no.1153, Mathura, Aquem, Alto Margao, Goa-403601
3. SAMPLE DESCRIPTION : Iron ore & lateritic Lumpy Iron Ore
4. DATE OF SUBMISSION : 14/02/2022
5. TESTED ON : 15/02/2022
6. LOCATION OF TESTING : At Laboratory
7. CONDITION OF SAMPLE : Satisfactory & Adequate

Sl. No	Test Parameters	Analysis Result	Units
1	Recovery Percentage of Iron ore	100	%
2	Recovery percentage of lateritic Lumpy Iron Ore	100	%

Note: 1.The report of analysis reflects LAB's findings at the time and place of Testing.
2. The results relate only to the sample tested.
3. Samples were drawn and submitted by customer.

For Spectrum Analytical Services

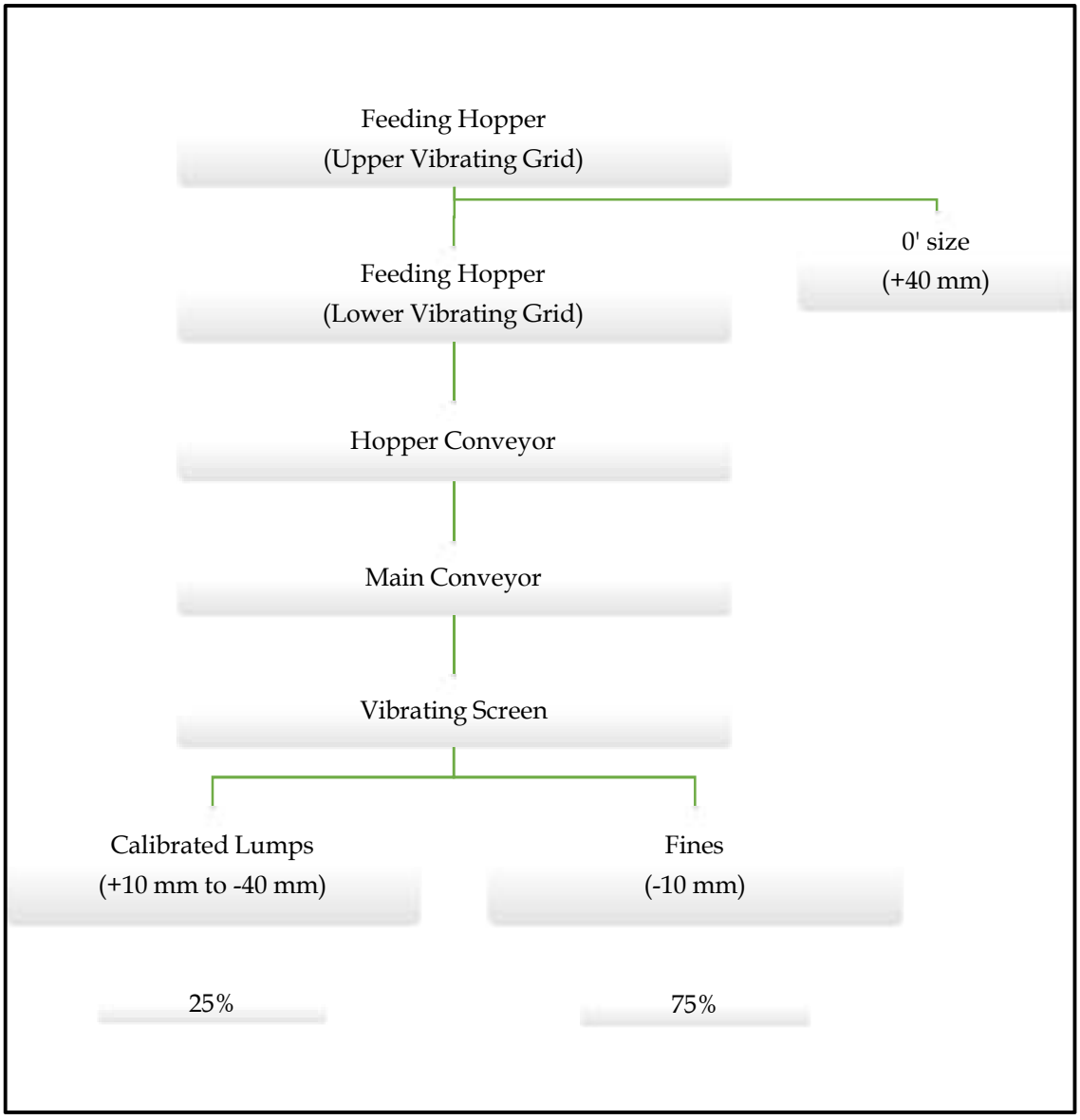
Authorized by- Samir Kumar Das

SPECTRUM ANALYTICAL SERVICES JODA

Authorized Signatory

----END OF REPORT----

MOBILE DRY SCREENING PLANT FLOW SHEET



ENVIRONMENTAL BASELINE DATA

Post Monsoon, 2020

(October to December, 2020)

PROJECT: **Zamblidadga Dongor Mine**

(ML No. 3/FeMn/79)

Village : Caurem,
Taluka : Quepem,
District : South Goa,
State : Goa

Lessee: SHRI. NARAINA S. QUIRTONIM.,

MARGAO, GOA

CONSULTANT

MINERAL ENGINEERING SERVICES
Mining & Environmental Engineers
25/XXV, Club Road, BALLARI - 583 103.
Tel/Fax: 08392-267421
E-mail:mes_msraju@yahoo.co.uk

LIST OF TABLES

MINERAL ENGINEERING SERVICES

(Recognised by GOI, MoEF&CC under E(P) Act 1986 Vide Gazette Notification No. S.O. 857 (E) dated 26.02.2018. Recognition valid upto 25.02.2023

ISO9001:2015
OHSAS (ISO 45001:2018)

Table No. A

METEOROLOGICAL DATA

Project : Zamblidadga Dongor Mine (ML No. 3/FeMn/79)

Date	Temperature in ^{O}C		Relative Humidity in %		Wind Speed Km/hr	
	Min.	Max.	Min.	Max.	Max.	Average
01/10/2020	24.5	31.6	62.1	99.8	4.0	0.71
02/10/2020	23.6	32.1	65.3	96.3	6.0	0.67
03/10/2020	24.0	33.0	71.5	98.3	1.0	0.17
04/10/2020	23.8	30.0	84.7	99.6	3.0	0.54
05/10/2020	24.2	31.2	69.9	98.5	1.0	0.04
06/10/2020	23.7	32.2	65.1	97.6	3.0	0.17
07/10/2020	23.9	33.7	57.2	96.3	1.0	0.25
08/10/2020	24.1	33.1	56.7	99.5	1.0	0.08
09/10/2020	24.3	32.8	57.1	96.0	4.0	0.38
10/10/2020	24.1	33.1	54.8	99.7	4.0	0.54
11/10/2020	23.1	31.7	57.5	97.0	3.0	0.38
12/10/2020	23.9	32.2	60.6	98.4	3.5	0.41
13/10/2020	23.6	32.7	58.3	90.0	4.1	0.29
14/10/2020	23.8	32.4	59.2	98.0	3.0	0.33
15/10/2020	23.8	34.2	58.1	96.0	3.8	0.36
16/10/2020	24.3	35.4	52.1	95.3	6.0	0.25
17/10/2020	24.1	35.9	54.3	88.0	1.0	0.04
18/10/2020	23.3	37.8	43.8	94.5	3.0	0.17
19/10/2020	22.4	36.6	48.0	99.9	1.0	0.13
20/10/2020	25.3	31.4	47.7	99.7	1.0	0.08
21/10/2020	24.7	35.7	45.5	98.0	3.0	0.17
22/10/2020	25.1	32.4	52.0	78.0	4.0	0.33
23/10/2020	26.3	32.2	49.4	97.0	4.3	0.31
24/10/2020	25.4	32.3	56.0	78.0	4.5	0.35
25/10/2020	25.3	32.4	52.0	80.0	4.0	0.35
26/10/2020	23.7	32.9	70.1	98.8	2.6	0.10
27/10/2020	24.3	34.0	60.8	99.6	3.0	0.17
28/10/2020	25.3	32.4	62.7	78.0	1.0	0.08
29/10/2020	23.3	35.4	50.0	98.7	1.8	0.15
30/10/2020	24.0	38.0	37.1	94.4	1.4	0.37
31/10/2020	25.1	36.4	46.1	94.5	4.1	0.47

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
HEAD OF LABORATORY

25/XXV, Club Road, Ballari - 583 103. Karnataka. Landline No. : 08392-267421.

E-mail : mes_msraju@yahoo.co.uk
mesbly25@gmail.com

Website : www.envtest.com

MINERAL ENGINEERING SERVICES

(Recognised by GOI, MoEF&CC under E(P) Act 1986 Vide Gazette Notification No. S.O. 857 (E) dated 26.02.2018. Recognition valid upto 25.02.2023

ISO9001:2015
OHSAS (ISO 45001:2018)

Table No. B

METEOROLOGICAL DATA

Project : Zamblidadga Dongor Mine (ML No. 3/FeMn/79)

Date	Temperature in °C		Relative Humidity in %		Wind Speed Km/hr	
	Min.	Max.	Min.	Max.	Max.	Average
01/11/2020	24.1	37.0	45.4	95.0	5.5	0.6
02/11/2020	24.0	36.3	46.3	97.4	8.3	1.2
03/11/2020	23.1	38.4	41.0	97.3	5.0	0.9
04/11/2020	23.3	37.5	45.0	96.2	5.8	0.7
05/11/2020	22.1	38.4	31.0	98.1	4.1	1.0
06/11/2020	19.2	39.1	33.1	96.4	3.5	0.9
07/11/2020	23.1	39.3	40.2	94.4	6.8	1.4
08/11/2020	24.3	38.3	40.3	96.3	4.3	1.3
09/11/2020	23.0	37.4	35.0	97.2	4.0	1.0
10/11/2020	17.6	36.3	26.2	96.0	4.9	1.4
11/11/2020	15.2	37.0	28.0	96.4	5.5	1.5
12/11/2020	17.2	38.2	33.0	97.1	4.7	1.3
13/11/2020	24.1	37.3	43.1	91.3	6.3	2.9
14/11/2020	25.0	39.6	32.0	90.3	4.5	1.5
15/11/2020	23.2	39.1	30.2	94.5	6.0	2.1
16/11/2020	25.1	37.3	45.0	90.5	6.8	3.0
17/11/2020	26.0	37.5	42.0	88.3	6.1	2.0
18/11/2020	25.0	38.2	38.0	91.2	5.1	1.5
19/11/2020	24.0	37.1	44.0	97.4	6.0	1.3
20/11/2020	24.0	38.3	38.1	95.1	9.3	1.3
21/11/2020	22.5	38.6	29.3	96.5	3.2	0.6
22/11/2020	19.3	37.3	31.0	96.1	5.1	0.8
23/11/2020	20.1	37.3	38.3	95.4	5.1	1.0
24/11/2020	21.0	36.5	35.0	94.5	3.1	0.8
25/11/2020	19.1	37.4	31.1	97.3	4.4	0.8
26/11/2020	20.0	36.1	43.0	95.4	3.1	0.8
27/11/2020	22.0	35.3	38.2	95.2	7.3	2.1
28/11/2020	21.0	32.2	50.1	87.6	8.3	3.1
29/11/2020	25.1	35.0	46.1	75.4	5.9	3.2
30/11/2020	25.2	38.3	37.2	92.1	3.0	0.9

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
HEAD OF LABORATORY

25/XXV, Club Road, Ballari - 583 103. Karnataka. Landline No. : 08392-267421.

E-mail : mes_msraju@yahoo.co.uk
mesbly25@gmail.com

Website : www.envtest.com

MINERAL ENGINEERING SERVICES

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ISO9001:2015
OHSAS (ISO 45001:2018)

Table No. C

METEOROLOGICAL DATA

Project : Zamblidadga Dongor Mine (ML No. 3/FeMn/79)

Date	Temperature in °C		Relative Humidity in %		Wind Speed Km/hr	
	Min.	Max.	Min.	Max.	Max.	Average
01/12/2020	23.0	36.4	38.2	94.5	6.8	1.3
02/12/2020	20.1	37.0	30.2	95.3	3.7	0.9
03/12/2020	19.1	36.3	36.0	96.1	2.7	0.5
04/12/2020	21.1	37.4	36.6	94.5	5.4	2.0
05/12/2020	21.4	37.0	35.0	96.3	5.3	1.4
06/12/2020	21.0	39.0	25.2	90.1	5.7	1.9
07/12/2020	20.2	37.5	39.1	95.0	6.1	2.1
08/12/2020	25.0	36.4	89.5	44.3	4.4	1.6
09/12/2020	26.1	37.4	42.5	83.4	6.8	2.4
10/12/2020	24.0	36.2	45.2	92.5	5.4	1.3
11/12/2020	22.1	36.0	47.1	97.0	2.1	0.6
12/12/2020	23.0	35.3	37.1	97.5	5.5	1.1
13/12/2020	21.1	36.1	38.7	97.3	3.0	0.8
14/12/2020	20.2	36.3	40.3	97.6	2.5	0.6
15/12/2020	21.0	37.2	36.0	98.6	4.8	1.1
16/12/2020	20.3	36.2	37.3	93.0	4.5	1.2
17/12/2020	20.2	37.4	40.1	97.1	6.5	1.7
18/12/2020	22.0	37.0	40.2	96.4	4.6	1.1
19/12/2020	19.1	37.0	34.2	95.6	5.6	1.4
20/12/2020	19.0	35.3	34.2	94.2	6.6	1.6
21/12/2020	16.2	35.6	32.0	94.3	5.4	1.5
22/12/2020	17.2	36.1	30.2	94.5	3.9	1.2
23/12/2020	16.0	37.3	28.0	94.0	6.1	1.3
24/12/2020	19.2	36.3	37.0	96.3	7.3	1.4
25/12/2020	22.1	37.4	36.0	96.4	3.7	1.1
26/12/2020	22.0	37.3	29.3	95.1	5.0	1.5
27/12/2020	18.1	37.2	34.3	96.4	2.7	0.8
28/12/2020	16.3	36.2	35.0	96.5	7.4	0.9
29/12/2020	18.1	36.3	32.2	97.3	7.0	1.1
30/12/2020	19.3	36.3	32.1	98.7	4.7	0.9
31/12/2020	22.0	37.2	40.0	94.2	2.3	1.8

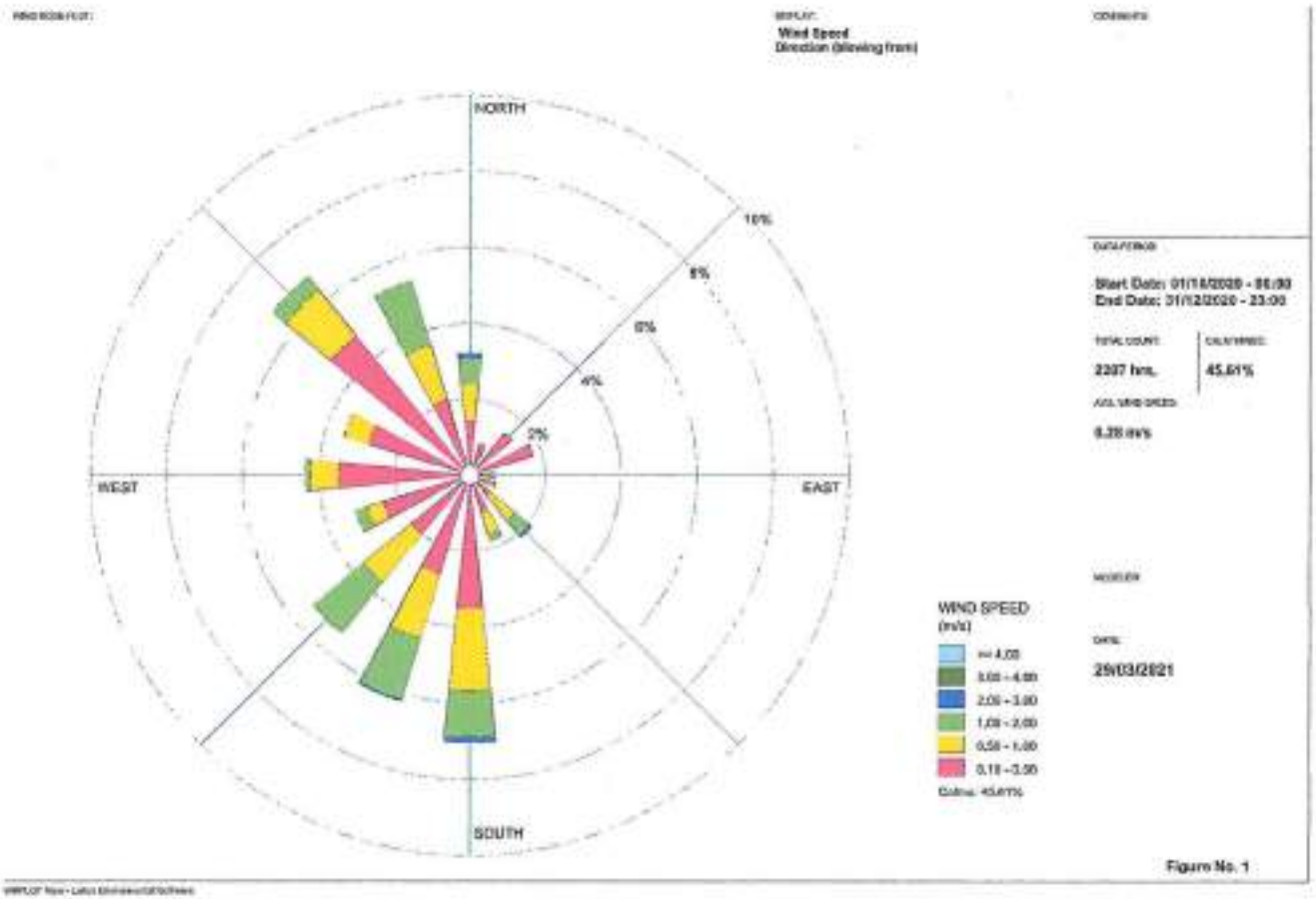
(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
HEAD OF LABORATORY

25/XXV, Club Road, Ballari - 583 103. Karnataka. Landline No. : 08392-267421.

E-mail : mes_msraju@yahoo.co.uk
mesbly25@gmail.com

Website : www.envtest.com


Wind Speed
Direction (blowing from)
NORTH
EAST
SOUTH
WEST
10%
8%
6%
4%
2%
WIND SPEED
(m/s)
Start Date: 01/12/2020 - 00:00
End Date: 31/12/2020 - 23:00
2207 hrs.
45.61%
0.28 m/s
29/03/2021
Figure No. 1

MINERAL ENGINEERING SERVICES

(Recognised by GOI, MoEF&CC under E(P) Act 1986 Vide Gazette Notification No. S.O. 857 (E) dated 26.02.2018. Recognition valid upto 25.02.2023

ISO9001:2015
OHSAS (ISO 45001:2018)

Table No. 1

ANALYSIS REPORT OF AMBIENT AIR QUALITY

MES/A/FTR/06/00

Project	:	Zamblidadga Dongor Mine (ML No. 3/FeMn/79)
Name of the lessee	:	Shri. Naraina S. Quirtonim
Station at & Code	:	A1 Out side the ML Area in N direction (Mllikarjuna Temple)
Month	:	24 Hrs
Duration	:	October, 2020
Date of Report	:	12.01.2021
Reference IS 5182		

Date of Sampling	Concentration					
	Sulphur Dioxide (SO_2), $\mu g/m^3$	Nitrogen Dioxide (NO_2), $\mu g/m^3$	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	Ammonia (NH_3), $\mu g/m^3$	Benzene (C_6H_6), $\mu g/m^3$
09.10.2020	12	14	35	19	<20	<1
10.10.2020	11	14	37	21	<20	<1
16.10.2020	11	14	41	26	<20	<1
17.10.2020	10	10	33	20	<20	<1
23.10.2020	11	12	40	22	<20	<1
24.10.2020	11	13	40	22	<20	<1
28.10.2020	8	12	38	23	<20	<1
29.10.2020	11	12	46	22	<20	<1
Limits for Industrial, Residential, Rural and other Areas	80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Concentration					
	Lead (Pb), $\mu g/m^3$	Nickel (Ni), ng/m^3	Arsenic (As), ng/m^3	Benzo(a)Pyrene (BaP), ng/m^3	Carbon Monoxide* (CO), mg/m^3	Ozone* (O_3), $\mu g/m^3$
09.10.2020	0.15	<0.5	<0.5	<0.5	0.13	25
10.10.2020	0.09	<0.5	<0.5	<0.5	0.21	20
16.10.2020	0.10	<0.5	<0.5	<0.5	0.09	29
17.10.2020	0.08	<0.5	<0.5	<0.5	0.11	20
23.10.2020	0.05	<0.5	<0.5	<0.5	0.15	22
24.10.2020	0.11	<0.5	<0.5	<0.5	0.18	20
28.10.2020	0.06	<0.5	<0.5	<0.5	0.21	23
29.10.2020	0.05	<0.5	<0.5	<0.5	0.11	26
Limits for Industrial, Residential, Rural and other Areas	1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for a period of 1 hr

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
HEAD OF LABORATORY

25/XXV, Club Road, Ballari - 583 103. Karnataka. Landline No. : 08392-267421.

E-mail : mes_msraju@yahoo.co.uk
mesbly25@gmail.com

Website : www.envtest.com

MINERAL ENGINEERING SERVICES

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NABET

ISO9001:2015
OHSAS (ISO 45001:2018)

Table No. 2

ANALYSIS REPORT OF AMBIENT AIR QUALITY

MES/A/FTR/08/00

Project	: Zamblidadga Dongor Mine (ML No. 3/FeMn/79)
Client	: Shri. Naraina S. Quirtonim
Station at & Code	: A2 Kavarem village
Month	: 24 Hrs
Duration	: October, 2020
Date of Report	: 12.01.2021
Reference IS 5182	

Date of Sampling	Concentration					
	Sulphur Dioxide (SO_2), $\mu g/m^3$	Nitrogen Dioxide (NO_2), $\mu g/m^3$	PM_{10}, ($\mu g/m^3$)	$PM_{2.5}$, ($\mu g/m^3$)	Ammonia (NH_3), $\mu g/m^3$	Benzene (C_6H_6), $\mu g/m^3$
09.10.2020	9	15	51	23	<20	<1
10.10.2020	10	10	40	20	<20	<1
16.10.2020	8	9	39	23	<20	<1
17.10.2020	9	10	39	21	<20	<1
23.10.2020	11	12	44	20	<20	<1
24.10.2020	8	14	30	22	<20	<1
28.10.2020	9	11	36	42	<20	<1
29.10.2020	10	9	42	40	<20	<1
Limits for Industrial, Residential, Rural and other Areas	80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Concentration					
	Lead (Pb), $\mu g/m^3$	Nickel (Ni), ng/m^3	Arsenic (As), ng/m^3	Benzo(a)Pyrene (BaP), ng/m^3	Carbon Monoxide* (CO), mg/m^3	Ozone* (O_3), $\mu g/m^3$
09.10.2020	0.09	<0.5	<0.5	<0.5	0.17	27
10.10.2020	0.08	<0.5	<0.5	<0.5	0.10	21
16.10.2020	0.06	<0.5	<0.5	<0.5	0.15	26
17.10.2020	0.11	<0.5	<0.5	<0.5	0.09	24
23.10.2020	0.12	<0.5	<0.5	<0.5	0.14	22
24.10.2020	0.11	<0.5	<0.5	<0.5	0.23	20
28.10.2020	0.08	<0.5	<0.5	<0.5	0.17	23
29.10.2020	0.05	<0.5	<0.5	<0.5	0.08	20
Limits for Industrial, Residential, Rural and other Areas	1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note :- * Parameters monitored for a period of 1 hr

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
HEAD OF LABORATORY

25/XXV, Club Road, Ballari - 583 103. Karnataka. Landline No. : 08392-267421.

E-mail : mes_msraju@yahoo.co.uk
mesbly25@gmail.com

Website : www.envtest.com

MINERAL ENGINEERING SERVICES

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ISO9001:2015
OHSAS (ISO 45001:2018)

Table No. 3

ANALYSIS REPORT OF AMBIENT AIR QUALITY

MES/A/FTR/08/00

Project	: Zamblidadga Dongor Mine (ML No. 3/FeMn/79)
Client	: Shri. Naraina S. Quirtonim
Station at & Code	: A3 Shinshore village
Month	: 24 Hrs
Duration	: October, 2020
Date of Report	: 12.01.2021
Reference IS 5182	

Date of Sampling	Concentration					
	Sulphur Dioxide (SO_2), $\mu g/m^3$	Nitrogen Dioxide (NO_2), $\mu g/m^3$	PM_{10}, ($\mu g/m^3$)	$PM_{2.5}$, ($\mu g/m^3$)	Ammonia (NH_3), $\mu g/m^3$	Benzene (C_6H_6), $\mu g/m^3$
09.10.2020	7	9	40	26	<20	<1
10.10.2020	9	12	46	22	<20	<1
16.10.2020	8	10	35	16	<20	<1
17.10.2020	9	11	30	19	<20	<1
23.10.2020	11	17	44	25	<20	<1
24.10.2020	10	15	50	27	<20	<1
28.10.2020	9	11	46	26	<20	<1
29.10.2020	8	10	35	15	<20	<1
Limits for Industrial, Residential, Rural and other Areas	80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Concentration					
	Lead (Pb), $\mu g/m^3$	Nickel (Ni), ng/m^3	Arsenic (As), ng/m^3	Benzo(a)Pyrene (BaP), ng/m^3	Carbon Monoxide* (CO), mg/m^3	Ozone* (O_3), $\mu g/m^3$
09.10.2020	0.05	<0.5	<0.5	<0.5	0.05	20
10.10.2020	0.13	<0.5	<0.5	<0.5	0.08	21
16.10.2020	0.08	<0.5	<0.5	<0.5	0.06	23
17.10.2020	0.13	<0.5	<0.5	<0.5	0.09	25
23.10.2020	0.06	<0.5	<0.5	<0.5	0.15	26
24.10.2020	0.11	<0.5	<0.5	<0.5	0.24	20
28.10.2020	0.05	<0.5	<0.5	<0.5	0.15	23
29.10.2020	0.05	<0.5	<0.5	<0.5	0.13	22
Limits for Industrial, Residential, Rural and other Areas	1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for a period of 1 hr

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
HEAD OF LABORATORY

25/XXV, Club Road, Ballari - 583 103. Karnataka. Landline No. : 08392-267421.

E-mail : mes_msraju@yahoo.co.uk
mesbly25@gmail.com

Website : www.envtest.com

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ISO9001:2015
OHSAS (ISO 45001:2018)

Table No. 4

ANALYSIS REPORT OF AMBIENT AIR QUALITY

MES/A/FTR/08/00

Project	:	Zamblidadga Dongor Mine (ML No. 3/FeMn/79)
Client	:	Shri. Naraina S. Quirtonim
Station at & Code	:	A4 Maina village
Month	:	24 Hrs
Duration	:	October, 2020
Date of Report	:	12.01.2021
Reference IS 5182		

Date of Sampling	Concentration					
	Sulphur Dioxide (SO_2), $\mu g/m^3$	Nitrogen Dioxide (NO_2), $\mu g/m^3$	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	Ammonia (NH_3), $\mu g/m^3$	Benzene (C_6H_6), $\mu g/m^3$
09.10.2020	6	9	38	20	<20	<1
10.10.2020	7	9	46	26	<20	<1
16.10.2020	8	10	40	22	<20	<1
17.10.2020	9	11	35	18	<20	<1
23.10.2020	10	14	49	23	<20	<1
24.10.2020	9	12	37	18	<20	<1
28.10.2020	7	10	43	24	<20	<1
29.10.2020	6	9	48	26	<20	<1
Limits for Industrial, Residential, Rural and other Areas	80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Concentration					
	Lead (Pb), $\mu g/m^3$	Nickel (Ni), ng/m^3	Arsenic (As), ng/m^3	Benzo(a)Pyrene (BaP), ng/m^3	Carbon Monoxide* (CO), mg/m^3	Ozone* (O_3), $\mu g/m^3$
09.10.2020	0.06	<0.5	<0.5	<0.5	0.05	21
10.10.2020	0.18	<0.5	<0.5	<0.5	0.19	20
16.10.2020	0.07	<0.5	<0.5	<0.5	0.06	25
17.10.2020	0.19	<0.5	<0.5	<0.5	0.05	23
23.10.2020	0.22	<0.5	<0.5	<0.5	<0.05	21
24.10.2020	0.05	<0.5	<0.5	<0.5	0.08	20
28.10.2020	<0.05	<0.5	<0.5	<0.5	0.06	<20
29.10.2020	0.05	<0.5	<0.5	<0.5	0.07	20
Limits for Industrial, Residential, Rural and other Areas	1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for a period of 1 hr

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
HEAD OF LABORATORY

25/XXV, Club Road, Ballari - 583 103. Karnataka. Landline No. : 08392-267421.

E-mail : mes_msraju@yahoo.co.uk
mesbly25@gmail.com

Website : www.envtest.com

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ISO9001:2015
OHSAS (ISO 45001:2018)

Table No. 5

ANALYSIS REPORT OF AMBIENT AIR QUALITY

MES/A/FTR/08/00

Project	: Zamblidadga Dongor Mine (ML No. 3/FeMn/79)
Client	: Shri. Naraina S. Quirtonim
Station at & Code	: A5 Khadde village
Month	: 24 Hrs
Duration	: October, 2020
Date of Report	: 12.01.2021
Reference IS 5182	

Date of Sampling	Concentration					
	Sulphur Dioxide (SO_2), $\mu g/m^3$	Nitrogen Dioxide (NO_2), $\mu g/m^3$	PM_{10}, ($\mu g/m^3$)	$PM_{2.5}$, ($\mu g/m^3$)	Ammonia (NH_3), $\mu g/m^3$	Benzene (C_6H_6), $\mu g/m^3$
09.10.2020	8	10	44	20	<20	<1
10.10.2020	9	9	49	22	<20	<1
16.10.2020	7	11	40	25	<20	<1
17.10.2020	9	12	53	28	<20	<1
23.10.2020	6	9	42	27	<20	<1
24.10.2020	8	9	56	29	<20	<1
28.10.2020	6	11	40	25	<20	<1
29.10.2020	7	11	35	20	<20	<1
Limits for Industrial, Residential, Rural and other Areas	80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Concentration					
	Lead (Pb), $\mu g/m^3$	Nickel (Ni), ng/m^3	Arsenic (As), ng/m^3	Benzo(a)Pyrene (BaP), ng/m^3	Carbon Monoxide* (CO), mg/m^3	Ozone* (O_3), $\mu g/m^3$
09.10.2020	0.12	<0.5	<0.5	<0.5	0.08	23
10.10.2020	0.16	<0.5	<0.5	<0.5	0.08	20
16.10.2020	0.12	<0.5	<0.5	<0.5	0.23	22
17.10.2020	0.09	<0.5	<0.5	<0.5	0.11	20
23.10.2020	0.08	<0.5	<0.5	<0.5	0.14	24
24.10.2020	0.12	<0.5	<0.5	<0.5	0.14	22
28.10.2020	0.06	<0.5	<0.5	<0.5	0.27	<20
29.10.2020	0.07	<0.5	<0.5	<0.5	0.20	20
Limits for Industrial, Residential, Rural and other Areas	1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for a period of 1 hr

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
HEAD OF LABORATORY

25/XXV, Club Road, Ballari - 583 103. Karnataka. Landline No. : 08392-267421.

E-mail : mes_msraju@yahoo.co.uk
mesbly25@gmail.com

Website : www.envtest.com

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ISO9001:2015
OHSAS (ISO 45001:2018)

Table No. 6

ANALYSIS REPORT OF AMBIENT AIR QUALITY

MES/A/FTR/08/00

Project	: Zamblidadga Dongor Mine (ML No. 3/FeMn/79)
Client	: Shri. Naraina S. Quirtonim
Station at & Code	: A6 Bendode village
Month	: 24 Hrs
Duration	: October, 2020
Date of Report	: 12.01.2021
Reference IS 5182	

Date of Sampling	Concentration					
	Sulphur Dioxide (SO_2), $\mu g/m^3$	Nitrogen Dioxide (NO_2), $\mu g/m^3$	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	Ammonia (NH_3), $\mu g/m^3$	Benzene (C_6H_6), $\mu g/m^3$
07.10.2020	12	16	53	29	<20	<1
08.10.2020	11	14	46	25	<20	<1
12.10.2020	9	11	55	30	<20	<1
13.10.2020	10	13	52	26	<20	<1
19.10.2020	11	15	38	20	<20	<1
20.10.2020	12	14	46	27	<20	<1
26.10.2020	9	11	53	26	<20	<1
27.10.2020	8	10	49	25	<20	<1
Limits for Industrial , Residential, Rural and other Areas	80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Concentration					
	Lead (Pb), $\mu g/m^3$	Nickel (Ni), ng/m^3	Arsenic (As), ng/m^3	Benzo(a)Pyrene (BaP), ng/m^3	Carbon Monoxide* (CO), mg/m^3	Ozone* (O_3), $\mu g/m^3$
07.10.2020	0.16	<0.5	<0.5	<0.5	0.11	20
08.10.2020	0.05	<0.5	<0.5	<0.5	0.09	21
12.10.2020	0.09	<0.5	<0.5	<0.5	0.05	23
13.10.2020	0.13	<0.5	<0.5	<0.5	0.11	25
19.10.2020	0.07	<0.5	<0.5	<0.5	0.25	24
20.10.2020	0.06	<0.5	<0.5	<0.5	0.11	20
26.10.2020	0.16	<0.5	<0.5	<0.5	0.31	21
27.10.2020	0.06	<0.5	<0.5	<0.5	0.22	20
Limits for Industrial , Residential, Rural and other Areas	1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for a period of 1 hr

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
HEAD OF LABORATORY

25/XXV, Club Road, Ballari - 583 103. Karnataka. Landline No. : 08392-267421.

E-mail : mes_msraju@yahoo.co.uk
mesbly25@gmail.com

Website : www.envtest.com

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ISO9001:2015
OHSAS (ISO 45001:2018)

Table No. 7

ANALYSIS REPORT OF AMBIENT AIR QUALITY

MES/A/FTR/08/00

Project	: Zamblidadga Dongor Mine (ML No. 3/FeMn/79)
Client	: Shri. Naraina S. Quirtonim
Station at & Code	: A7 Revona village
Month	: 24 Hrs
Duration	: October, 2020
Date of Report	: 12.01.2021
Reference IS 5182	

Date of Sampling	Concentration					
	Sulphur Dioxide (SO_2), $\mu g/m^3$	Nitrogen Dioxide (NO_2), $\mu g/m^3$	PM_{10}, ($\mu g/m^3$)	$PM_{2.5}$, ($\mu g/m^3$)	Ammonia (NH_3), $\mu g/m^3$	Benzene (C_6H_6), $\mu g/m^3$
09.10.2020	11	13	53	27	<20	<1
10.10.2020	13	15	48	25	<20	<1
16.10.2020	9	11	56	29	<20	<1
17.10.2021	11	12	50	26	<20	<1
23.10.2020	10	14	36	18	<20	<1
24.10.2020	7	9	51	28	<20	<1
28.10.2020	9	11	44	22	<20	<1
29.10.2020	11	13	47	26	<20	<1
Limits for Industrial, Residential, Rural and other Areas	80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Concentration					
	Lead (Pb), $\mu g/m^3$	Nickel (Ni), ng/m^3	Arsenic (As), ng/m^3	Benzo(a)Pyrene (BaP), ng/m^3	Carbon Monoxide* (CO), mg/m^3	Ozone* (O_3), $\mu g/m^3$
09.10.2020	0.06	<0.5	<0.5	<0.5	0.06	20
10.10.2020	0.18	<0.5	<0.5	<0.5	0.05	21
16.10.2020	0.05	<0.5	<0.5	<0.5	0.22	23
17.10.2021	0.09	<0.5	<0.5	<0.5	0.15	25
23.10.2020	0.11	<0.5	<0.5	<0.5	0.21	21
24.10.2020	0.05	<0.5	<0.5	<0.5	0.36	20
28.10.2020	0.08	<0.5	<0.5	<0.5	0.21	22
29.10.2020	0.06	<0.5	<0.5	<0.5	0.05	20
Limits for Industrial, Residential, Rural and other Areas	1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for a period of 1 hr

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
HEAD OF LABORATORY

25/XXV, Club Road, Ballari - 583 103. Karnataka. Landline No. : 08392-267421.

E-mail : mes_msraju@yahoo.co.uk
mesbly25@gmail.com

Website : www.envtest.com

MINERAL ENGINEERING SERVICES

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ISO9001:2015
OHSAS (ISO 45001:2018)

Table No. 8

ANALYSIS REPORT OF AMBIENT AIR QUALITY

MES/A/FTR/08/00

Project	:	Zamblidadga Dongor Mine (ML No. 3/FeMn/79)
Client	:	Shri. Naraina S. Quirtonim
Station at & Code	:	A8 Pirla village
Month	:	24 Hrs
Duration	:	October, 2020
Date of Report	:	12.01.2021
Reference IS 5182		

Date of Sampling	Concentration					
	Sulphur Dioxide (SO_2), $\mu g/m^3$	Nitrogen Dioxide (NO_2), $\mu g/m^3$	PM_{10}, ($\mu g/m^3$)	$PM_{2.5}$, ($\mu g/m^3$)	Ammonia (NH_3), $\mu g/m^3$	Benzene (C_6H_6), $\mu g/m^3$
07.10.2020	7	10	35	19	<20	<1
08.10.2020	6	9	45	27	<20	<1
12.10.2020	8	10	40	22	<20	<1
13.10.2020	9	11	50	28	<20	<1
19.10.2020	10	12	48	25	<20	<1
20.10.2020	9	11	36	16	<20	<1
26.10.2020	7	10	38	19	<20	<1
27.10.2020	6	9	43	21	<20	<1
Limits for Industrial, Residential, Rural and other Areas	80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Concentration					
	Lead (Pb), $\mu g/m^3$	Nickel (Ni), ng/m^3	Arsenic (As), ng/m^3	Benzo(a)Pyrene (BaP), ng/m^3	Carbon Monoxide* (CO), mg/m^3	Ozone* (O_3), $\mu g/m^3$
07.10.2020	0.05	<0.5	<0.5	<0.5	0.07	22
08.10.2020	0.13	<0.5	<0.5	<0.5	0.09	20
12.10.2020	0.06	<0.5	<0.5	<0.5	0.08	<20
13.10.2020	<0.05	<0.5	<0.5	<0.5	0.11	21
19.10.2020	0.09	<0.5	<0.5	<0.5	0.05	23
20.10.2020	0.13	<0.5	<0.5	<0.5	0.13	25
26.10.2020	0.06	<0.5	<0.5	<0.5	<0.05	21
27.10.2020	0.11	<0.5	<0.5	<0.5	0.05	20
Limits for Industrial, Residential, Rural and other Areas	1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for a period of 1 hr

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
HEAD OF LABORATORY

25/XXV, Club Road, Ballari - 583 103. Karnataka. Landline No. : 08392-267421.

E-mail : mes_msraju@yahoo.co.uk
mesbly25@gmail.com

Website : www.envtest.com

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MTIC INTERCERT

ISO9001:2015
OHSAS (ISO 45001:2018)

Table No. 9

ANALYSIS REPORT OF AMBIENT AIR QUALITY

MES/A/FTR/08/00

Project	:	Zamblidadga Dongor Mine (ML No. 3/FeMn/79)
Client	:	Shri. Naraina S. Quirtonim
Station at & Code	:	A1 Out side the ML Area in N direction (Mllikarjuna Temple)
Month	:	24 Hrs
Duration	:	November, 2020
Date of Report	:	12.01.2021
Reference IS 5182		

Date of Sampling	Concentration					
	Sulphur Dioxide (SO_2), µg/m³	Nitrogen Dioxide (NO_2), µg/m³	PM_{10}, (µg/m³)	$PM_{2.5}$, (µg/m³)	Ammonia (NH_3), µg/m³	Benzene (C_6H_6), µg/m³
06.11.2020	7	9	40	24	<20	<1
07.11.2020	9	11	50	25	<20	<1
13.11.2020	10	13	42	20	<20	<1
14.11.2020	11	12	30	17	<20	<1
20.11.2020	9	11	35	19	<20	<1
21.11.2020	7	10	46	23	<20	<1
27.11.2020	6	9	40	20	<20	<1
28.11.2020	10	12	32	19	<20	<1
Limits for Industrial, Residential, Rural and other Areas	80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Concentration					
	Lead (Pb), µg/m³	Nickel (Ni), ng/m³	Arsenic (As), ng/m³	Benzo(a)Pyrene (BaP), ng/m³	Carbon Monoxide* (CO), mg/m³	Ozone* (O_3), µg/m³
06.11.2020	0.05	<0.5	<0.5	<0.5	0.16	23
07.11.2020	0.11	<0.5	<0.5	<0.5	0.10	20
13.11.2020	0.05	<0.5	<0.5	<0.5	0.05	23
14.11.2020	0.13	<0.5	<0.5	<0.5	0.06	22
20.11.2020	0.08	<0.5	<0.5	<0.5	0.05	24
21.11.2020	0.06	<0.5	<0.5	<0.5	0.15	25
27.11.2020	0.05	<0.5	<0.5	<0.5	0.11	23
28.11.2020	<0.05	<0.5	<0.5	<0.5	0.05	26
Limits for Industrial, Residential, Rural and other Areas	1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note: * Parameters monitored for a period of 1 hr

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
HEAD OF LABORATORY

25/XXV, Club Road, Ballari - 583 103. Karnataka. Landline No. : 08392-267421.

E-mail : mes_msraju@yahoo.co.uk
mesbly25@gmail.com

Website : www.envtest.com

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NABET

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Table No. 10

ANALYSIS REPORT OF AMBIENT AIR QUALITY

MES/A/FTR/08/20

Project	: Zamblidadga Dongor Mine (ML No. 3/FeMn/79)
Client	: Shri. Naraina S. Quirtonim
Station at & Code	: A2 Kavarem village
Month	: 24 Hrs
Duration	: November, 2020
Date of Report	: 12.01.2021
Reference IS 5182	

Date of Sampling	Concentration					
	Sulphur Dioxide (SO_2), $\mu g/m^3$	Nitrogen Dioxide (NO_2), $\mu g/m^3$	PM_{10}, ($\mu g/m^3$)	$PM_{2.5}$, ($\mu g/m^3$)	Ammonia (NH_3), $\mu g/m^3$	Benzene (C_6H_6), $\mu g/m^3$
06.11.2020	10	12	39	19	<20	<1
07.11.2020	8	13	37	17	<20	<1
13.11.2020	6	10	33	18	<20	<1
14.11.2020	8	10	39	24	<20	<1
20.11.2020	10	11	40	22	<20	<1
21.11.2020	8	16	35	21	<20	<1
27.11.2020	9	13	50	26	<20	<1
28.11.2020	11	12	49	21	<20	<1
Limits for Industrial, Residential, Rural and other Areas	80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Concentration					
	Lead (Pb), $\mu g/m^3$	Nickel (Ni), ng/m^3	Arsenic (As), ng/m^3	Benzo(a)Pyrene (BaP), ng/m^3	Carbon Monoxide* (CO), mg/m^3	Ozone* (O_3), $\mu g/m^3$
06.11.2020	0.08	<0.5	<0.5	<0.5	0.20	24
07.11.2020	0.11	<0.5	<0.5	<0.5	0.22	22
13.11.2020	0.07	<0.5	<0.5	<0.5	0.08	25
14.11.2020	0.05	<0.5	<0.5	<0.5	0.07	21
20.11.2020	0.05	<0.5	<0.5	<0.5	0.21	20
21.11.2020	0.11	<0.5	<0.5	<0.5	0.18	22
27.11.2020	0.07	<0.5	<0.5	<0.5	0.42	21
28.11.2020	0.06	<0.5	<0.5	<0.5	0.15	24
Limits for Industrial, Residential, Rural and other Areas	1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr
Notes: * Parameters monitored for a period of 1 hr						

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
HEAD OF LABORATORY

25/XXV, Club Road, Ballari - 583 103. Karnataka. Landline No. : 08392-267421.

E-mail : mes_msraju@yahoo.co.uk
mesbly25@gmail.com

Website : www.envtest.com

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OHSAS (ISO 45001:2018)

Table No. 11

ANALYSIS REPORT OF AMBIENT AIR QUALITY

MES/A/FTR/06/00

Project	:	Zamblidadga Dongor Mine (ML No. 3/FeMn/79)
Client	:	Shri. Naraina S. Quirtonim
Station at & Code	:	A3 Shinshore village
Month	:	24 Hrs
Duration	:	November, 2020
Date of Report	:	12.01.2021
Reference IS 5182		

Date of Sampling	Concentration					
	Sulphur Dioxide (SO_2), $\mu g/m^3$	Nitrogen Dioxide (NO_2), $\mu g/m^3$	PM_{10}, ($\mu g/m^3$)	$PM_{2.5}$, ($\mu g/m^3$)	Ammonia (NH_3), $\mu g/m^3$	Benzene (C_6H_6), $\mu g/m^3$
06.11.2020	10	11	40	28	<20	<1
07.11.2021	12	13	42	26	<20	<1
13.11.2020	8	9	35	21	<20	<1
14.11.2020	10	11	41	26	<20	<1
20.11.2020	6	9	37	19	<20	<1
21.11.2020	9	11	53	28	<20	<1
27.11.2020	10	11	48	26	<20	<1
28.11.2020	7	9	42	22	<20	<1
Limits for Industrial, Residential, Rural and other Areas	80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Concentration					
	Lead (Pb), $\mu g/m^3$	Nickel (Ni), ng/m^3	Arsenic (As), ng/m^3	Benzo(a)Pyrene (BaP), ng/m^3	Carbon Monoxide* (CO), mg/m^3	Ozone* (O_3), $\mu g/m^3$
06.11.2020	0.15	<0.5	<0.5	<0.5	0.47	20
07.11.2021	0.16	<0.5	<0.5	<0.5	0.08	<20
13.11.2020	0.06	<0.5	<0.5	<0.5	0.16	25
14.11.2020	0.11	<0.5	<0.5	<0.5	0.15	22
20.11.2020	0.13	<0.5	<0.5	<0.5	0.47	26
21.11.2020	0.05	<0.5	<0.5	<0.5	0.31	20
27.11.2020	0.16	<0.5	<0.5	<0.5	0.11	23
28.11.2020	0.16	<0.5	<0.5	<0.5	0.18	20
Limits for Industrial, Residential, Rural and other Areas	1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for a period of 1 hr

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
HEAD OF LABORATORY

25/XXV, Club Road, Ballari - 583 103. Karnataka. Landline No. : 08392-267421.

E-mail : mes_msraju@yahoo.co.uk
mesbly25@gmail.com

Website : www.envtest.com

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Table No. 12

ANALYSIS REPORT OF AMBIENT AIR QUALITY

MES/A/FTR/08/00

Project	:	Zamblidadga Dongor Mine (ML No. 3/FeMn/79)
Client	:	Shri. Naraina S. Quirtonim
Station at & Code	:	A4 Maina village
Month	:	24 Hrs
Duration	:	November, 2020
Date of Report	:	12.01.2021
Reference IS 5182		

Date of Sampling	Concentration					
	Sulphur Dioxide (SO_2), $\mu g/m^3$	Nitrogen Dioxide (NO_2), $\mu g/m^3$	PM_{10}, ($\mu g/m^3$)	$PM_{2.5}$, ($\mu g/m^3$)	Ammonia (NH_3), $\mu g/m^3$	Benzene (C_6H_6), $\mu g/m^3$
06.11.2020	12	14	45	25	<20	<1
07.11.2021	9	11	39	18	<20	<1
13.11.2020	7	12	46	25	<20	<1
14.11.2020	11	12	50	29	<20	<1
20.11.2020	6	9	41	23	<20	<1
21.11.2020	10	11	53	28	<20	<1
27.11.2020	9	12	40	22	<20	<1
28.11.2020	7	11	36	18	<20	<1
Limits for Industrial, Residential, Rural and other Areas	80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Concentration					
	Lead (Pb), $\mu g/m^3$	Nickel (Ni), ng/m^3	Arsenic (As), ng/m^3	Benzo(a)Pyrene (BaP), ng/m^3	Carbon Monoxide* (CO), mg/m^3	Ozone* (O_3), $\mu g/m^3$
06.11.2020	0.16	<0.5	<0.5	<0.5	0.08	26
07.11.2021	0.08	<0.5	<0.5	<0.5	0.33	22
13.11.2020	0.05	<0.5	<0.5	<0.5	0.16	20
14.11.2020	0.09	<0.5	<0.5	<0.5	0.22	22
20.11.2020	0.13	<0.5	<0.5	<0.5	0.35	25
21.11.2020	0.09	<0.5	<0.5	<0.5	0.26	26
27.11.2020	0.05	<0.5	<0.5	<0.5	0.13	20
28.11.2020	0.16	<0.5	<0.5	<0.5	0.37	26
Limits for Industrial, Residential, Rural and other Areas	1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for a period of 1 hr

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
HEAD OF LABORATORY

25/XXV, Club Road, Ballari - 583 103. Karnataka. Landline No. : 08392-267421.

E-mail : mes_msraju@yahoo.co.uk
mesbly25@gmail.com

Website : www.envtest.com

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Table No. 13

ANALYSIS REPORT OF AMBIENT AIR QUALITY

MES/A/FTR/08/00

Project	:	Zamblidadga Dongor Mine (ML No. 3/FeMn/79)
Client	:	Shri. Naraina S. Quirtonim
Station at & Code	:	A5 Khadde village
Month	:	24 Hrs
Duration	:	November, 2020
Date of Report	:	12.01.2021
Reference IS 5182		

Date of Sampling	Concentration					
	Sulphur Dioxide (SO_2), $\mu g/m^3$	Nitrogen Dioxide (NO_2), $\mu g/m^3$	PM_{10}, ($\mu g/m^3$)	$PM_{2.5}$, ($\mu g/m^3$)	Ammonia (NH_3), $\mu g/m^3$	Benzene (C_6H_6), $\mu g/m^3$
06.11.2020	9	12	48	22	<20	<1
07.11.2021	12	15	37	23	<20	<1
13.11.2020	9	16	41	21	<20	<1
14.11.2020	12	15	45	23	<20	<1
20.11.2020	10	13	48	25	<20	<1
21.11.2020	8	13	51	23	<20	<1
27.11.2020	10	13	44	20	<20	<1
28.11.2020	12	14	37	25	<20	<1
Limits for Industrial, Residential, Rural and other Areas	80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Concentration					
	Lead (Pb), $\mu g/m^3$	Nickel (Ni), ng/m^3	Arsenic (As), ng/m^3	Benzo(a)Pyrene (BaP), ng/m^3	Carbon Monoxide* (CO), mg/m^3	Ozone* (O_3), $\mu g/m^3$
06.11.2020	0.35	<0.5	<0.5	<0.5	0.30	25
07.11.2021	0.22	<0.5	<0.5	<0.5	0.24	<20
13.11.2020	0.15	<0.5	<0.5	<0.5	0.34	22
14.11.2020	0.18	<0.5	<0.5	<0.5	0.17	23
20.11.2020	0.15	<0.5	<0.5	<0.5	0.33	20
21.11.2020	0.15	<0.5	<0.5	<0.5	0.09	22
27.11.2020	0.19	<0.5	<0.5	<0.5	0.29	23
28.11.2020	0.60	<0.5	<0.5	<0.5	0.22	<20
Limits for Industrial, Residential, Rural and other Areas	1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for a period of 1 hr

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
HEAD OF LABORATORY

25/XXV, Club Road, Ballari - 583 103. Karnataka. Landline No. : 08392-267421.

E-mail : mes_msraju@yahoo.co.uk
mesbly25@gmail.com

Website : www.envtest.com

Table No. 14

ANALYSIS REPORT OF AMBIENT AIR QUALITY

MES/A/FTR/08/00

Project	: Zamblidadga Dongor Mine (ML No. 3/FeMn/79)
Client	: Shri. Naraina S. Quirtonim
Station at & Code	: A6 Bendode village
Month	: 24 Hrs
Duration	: November, 2020
Date of Report	: 12.01.2021
Reference IS 5182	

Date of Sampling	Concentration					
	Sulphur Dioxide (SO_2), µg/m³	Nitrogen Dioxide (NO_2), µg/m³	PM_{10}, (µg/m³)	$PM_{2.5}$, (µg/m³)	Ammonia (NH_3), µg/m³	Benzene (C_6H_6), µg/m³
04.11.2020	8	9	42	19	<20	<1
05.11.2020	11	12	46	17	<20	<1
11.11.2020	8	11	41	22	<20	<1
12.11.2020	12	13	37	23	<20	<1
18.11.2020	9	11	53	21	<20	<1
19.11.2020	8	9	37	27	<20	<1
25.11.2020	9	11	37	19	<20	<1
26.11.2020	7	9	44	17	<20	<1
Limits for Industrial, Residential, Rural and other Areas	80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Concentration					
	Lead (Pb), µg/m³	Nickel (Ni), ng/m³	Arsenic (As), ng/m³	Benzo(a)Pyrene (BaP), ng/m³	Carbon Monoxide* (CO), mg/m³	Ozone* (O_3), µg/m³
04.11.2020	0.05	<0.5	<0.5	<0.5	0.05	20
05.11.2020	0.08	<0.5	<0.5	<0.5	0.22	26
11.11.2020	0.05	<0.5	<0.5	<0.5	0.15	20
12.11.2020	0.05	<0.5	<0.5	<0.5	0.25	24
18.11.2020	0.16	<0.5	<0.5	<0.5	0.05	23
19.11.2020	0.06	<0.5	<0.5	<0.5	0.08	22
25.11.2020	<0.05	<0.5	<0.5	<0.5	0.07	21
26.11.2020	0.11	<0.5	<0.5	<0.5	0.15	22
Limits for Industrial, Residential, Rural and other Areas	1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note:- * Parameters monitored for a period of 1 hr

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
HEAD OF LABORATORY

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Table No. 15

ANALYSIS REPORT OF AMBIENT AIR QUALITY

MES/A/FTR/08/00

Project	:	Zamblidadga Dongor Mine (ML No. 3/FeMn/79)
Client	:	Shri. Naraina S. Quirtonim
Station at & Code	:	A7 Revona village
Month	:	24 Hrs
Duration	:	November, 2020
Date of Report	:	12.01.2021
Reference IS 5182		

Date of Sampling	Concentration					
	Sulphur Dioxide (SO_2), $\mu g/m^3$	Nitrogen Dioxide (NO_2), $\mu g/m^3$	PM_{10}, ($\mu g/m^3$)	$PM_{2.5}$, ($\mu g/m^3$)	Ammonia (NH_3), $\mu g/m^3$	Benzene (C_6H_6), $\mu g/m^3$
06.11.2020	11	12	56	32	<20	<1
07.11.2021	9	11	50	29	<20	<1
13.11.2020	12	12	40	23	<20	<1
14.11.2020	11	12	40	24	<20	<1
20.11.2020	7	9	48	28	<20	<1
21.11.2020	12	13	45	22	<20	<1
27.11.2020	9	11	48	25	<20	<1
28.11.2020	11	13	33	18	<20	<1
Limits for Industrial, Residential, Rural and other Areas	80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Concentration					
	Lead (Pb), $\mu g/m^3$	Nickel (Ni), ng/m^3	Arsenic (As), ng/m^3	Benzo(a)Pyrene (BaP), ng/m^3	Carbon Monoxide* (CO), mg/m^3	Ozone* (O_3), $\mu g/m^3$
06.11.2020	0.11	<0.5	<0.5	<0.5	0.06	22
07.11.2021	0.06	<0.5	<0.5	<0.5	0.08	24
13.11.2020	0.08	<0.5	<0.5	<0.5	0.15	28
14.11.2020	0.11	<0.5	<0.5	<0.5	0.08	23
20.11.2020	0.08	<0.5	<0.5	<0.5	0.11	27
21.11.2020	0.05	<0.5	<0.5	<0.5	0.22	25
27.11.2020	0.13	<0.5	<0.5	<0.5	0.35	27
28.11.2020	0.08	<0.5	<0.5	<0.5	0.06	23
Limits for Industrial, Residential, Rural and other Areas	1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for a period of 1 hr

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
HEAD OF LABORATORY

25/XXV, Club Road, Ballari - 583 103. Karnataka. Landline No. : 08392-267421.

E-mail : mes_msraju@yahoo.co.uk
mesbly25@gmail.com

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ISO9001:2015
OHSAS (ISO 45001:2018)

Table No. 16

ANALYSIS REPORT OF AMBIENT AIR QUALITY

MES/A/FTR/06/00

Project	:	Zamblidadga Dongor Mine (ML No. 3/FeMn/79)
Client	:	Shri. Naraina S. Quirtonim
Station at & Code	:	A8 Pirla village
Month	:	24 Hrs
Duration	:	November, 2020
Date of Report	:	12.01.2021
Reference IS 5182		

Date of Sampling	Concentration					
	Sulphur Dioxide (SO_2), $\mu g/m^3$	Nitrogen Dioxide (NO_2), $\mu g/m^3$	PM_{10}, ($\mu g/m^3$)	$PM_{2.5}$, ($\mu g/m^3$)	Ammonia (NH_3), $\mu g/m^3$	Benzene (C_6H_6), $\mu g/m^3$
04.11.2020	6	9	38	21	<20	<1
05.11.2020	7	11	46	27	<20	<1
11.11.2020	6	9	41	22	<20	<1
12.11.2020	9	11	36	19	<20	<1
18.11.2020	10	12	40	22	<20	<1
19.11.2020	9	11	33	21	<20	<1
25.11.2020	7	9	48	27	<20	<1
26.11.2020	11	12	46	26	<20	<1
Limits for Industrial , Residential, Rural and other Areas	80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Concentration					
	Lead (Pb), $\mu g/m^3$	Nickel (Ni), ng/m^3	Arsenic (As), ng/m^3	Benzo(a)Pyrene (BaP), ng/m^3	Carbon Monoxide* (CO), mg/m^3	Ozone* (O_3), $\mu g/m^3$
04.11.2020	0.16	<0.5	<0.5	<0.5	0.05	20
05.11.2020	0.05	<0.5	<0.5	<0.5	0.07	21
11.11.2020	0.14	<0.5	<0.5	<0.5	0.06	23
12.11.2020	0.05	<0.5	<0.5	<0.5	0.05	20
18.11.2020	0.09	<0.5	<0.5	<0.5	0.07	21
19.11.2020	0.07	<0.5	<0.5	<0.5	0.09	<20
25.11.2020	0.05	<0.5	<0.5	<0.5	0.05	23
26.11.2020	0.06	<0.5	<0.5	<0.5	0.11	21
Limits for Industrial , Residential, Rural and other Areas	1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for a period of 1 hr

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
HEAD OF LABORATORY

25/XXV, Club Road, Ballari - 583 103. Karnataka. Landline No. : 08392-267421.

E-mail : mes_msraju@yahoo.co.uk
mesbly25@gmail.com

Website : www.envtest.com

Table No. 17

ANALYSIS REPORT OF AMBIENT AIR QUALITY

MES/A/FTR/08/00

Project	: Zamblidadga Dongor Mine (ML No. 3/FeMn/79)
Client	: Shri. Naraina S. Quirtonim
Station at & Code	: A1 Out side the ML Area in N direction (Mllikarjuna Temple)
Month	: 24 Hrs
Duration	: December, 2020
Date of Report	: 12.01.2021
Reference IS 6182	

Date of Sampling	Concentration					
	Sulphur Dioxide (SO_2), $\mu g/m^3$	Nitrogen Dioxide (NO_2), $\mu g/m^3$	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	Ammonia (NH_3), $\mu g/m^3$	Benzene (C_6H_6), $\mu g/m^3$
04.12.2020	6	9	35	18	<20	<1
05.12.2020	6	10	30	17	<20	<1
11.12.2020	8	10	38	20	<20	<1
12.12.2020	7	11	40	23	<20	<1
18.12.2020	9	10	50	25	<20	<1
19.12.2020	6	9	37	19	<20	<1
25.12.2020	7	11	28	18	<20	<1
26.12.2020	7	9	30	19	<20	<1
30.12.2020	10	12	48	24	<20	<1
31.12.2020	8	11	30	19	<20	<1
Limits for Industrial , Residential, Rural and other Areas	80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Concentration					
	Lead (Pb), $\mu g/m^3$	Nickel (Ni), ng/m^3	Arsenic (As), ng/m^3	Benzo(a)Pyrene (BaP), ng/m^3	Carbon Monoxide* (CO), mg/m^3	Ozone* (O_3), $\mu g/m^3$
04.12.2020	0.10	<0.5	<0.5	<0.5	0.16	20
05.12.2020	0.05	<0.5	<0.5	<0.5	0.05	22
11.12.2020	0.06	<0.5	<0.5	<0.5	0.11	24
12.12.2020	0.07	<0.5	<0.5	<0.5	0.08	23
18.12.2020	0.08	<0.5	<0.5	<0.5	0.06	21
19.12.2020	0.05	<0.5	<0.5	<0.5	0.11	20
25.12.2020	0.06	<0.5	<0.5	<0.5	0.07	20
26.12.2020	0.13	<0.5	<0.5	<0.5	0.05	21
30.12.2020	0.11	<0.5	<0.5	<0.5	0.05	22
31.12.2020	0.09	<0.5	<0.5	<0.5	0.15	20
Limits for Industrial , Residential, Rural and other Areas	1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for a period of 1 hr

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
HEAD OF LABORATORY

Table No. 18

ANALYSIS REPORT OF AMBIENT AIR QUALITY

MES/A/FTR/08/00

Project	: Zamblidadga Dongor Mine (ML No. 3/FeMn/79)
Client	: Shri. Naraina S. Quirtonim
Station at & Code	: A2 Kavarem village
Month	: 24 Hrs
Duration	: December, 2020
Date of Report	: 12.01.2021
Reference IS 5182	

Date of Sampling	Concentration					
	Sulphur Dioxide (SO_2), $\mu g/m^3$	Nitrogen Dioxide (NO_2), $\mu g/m^3$	PM_{10}, ($\mu g/m^3$)	$PM_{2.5}$, ($\mu g/m^3$)	Ammonia (NH_3), $\mu g/m^3$	Benzene (C_6H_6), $\mu g/m^3$
04.12.2020	12	17	45	19	<20	<1
05.12.2020	9	15	48	18	<20	<1
11.12.2020	12	13	53	25	<20	<1
12.12.2020	9	13	42	26	<20	<1
18.12.2020	13	16	56	21	<20	<1
19.12.2020	11	13	48	21	<20	<1
25.12.2020	6	9	33	22	<20	<1
26.12.2020	10	12	35	26	<20	<1
30.12.2020	8	15	49	28	<20	<1
31.12.2020	9	11	38	26	<20	<1
Limits for Industrial , Residential, Rural and other Areas	80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Concentration					
	Lead (Pb), $\mu g/m^3$	Nickel (Ni), ng/m^3	Arsenic (As), ng/m^3	Benzo(a)Pyrene (BaP), ng/m^3	Carbon Monoxide* (CO), mg/m^3	Ozone* (O_3), $\mu g/m^3$
04.12.2020	0.16	<0.5	<0.5	<0.5	0.15	24
05.12.2020	0.11	<0.5	<0.5	<0.5	0.16	20
11.12.2020	0.08	<0.5	<0.5	<0.5	0.30	20
12.12.2020	0.08	<0.5	<0.5	<0.5	0.08	23
18.12.2020	0.12	<0.5	<0.5	<0.5	0.17	<20
19.12.2020	0.05	<0.5	<0.5	<0.5	0.08	21
25.12.2020	0.08	<0.5	<0.5	<0.5	0.25	22
26.12.2020	0.16	<0.5	<0.5	<0.5	0.16	21
30.12.2020	0.20	<0.5	<0.5	<0.5	0.22	24
31.12.2020	0.06	<0.5	<0.5	<0.5	0.16	20
Limits for Industrial , Residential, Rural and other Areas	1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for a period of 1 hr

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
HEAD OF LABORATORY

Table No. 19

ANALYSIS REPORT OF AMBIENT AIR QUALITY

MES/A/FTR/08/00

Project	: Zamblidadga Dongor Mine (ML No. 3/FeMn/79)
Client	: Shri. Naraina S. Quirtonim
Station at & Code	: A3 Shinshore village
Month	: 24 Hrs
Duration	: December, 2020
Date of Report	: 12.01.2021
Reference IS 5182	

Date of Sampling	Concentration					
	Sulphur Dioxide (SO_2), µg/m³	Nitrogen Dioxide (NO_2), µg/m³	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	Ammonia (NH_3), µg/m³	Benzene (C_6H_6), µg/m³
04.12.2020	9	11	51	29	<20	<1
05.12.2020	10	12	45	24	<20	<1
11.12.2020	11	13	48	26	<20	<1
12.12.2020	7	9	38	22	<20	<1
18.12.2020	10	12	42	21	<20	<1
19.12.2020	8	9	44	20	<20	<1
25.12.2020	10	11	39	17	<20	<1
26.12.2020	6	9	45	28	<20	<1
30.12.2020	12	13	36	18	<20	<1
31.12.2020	11	12	49	24	<20	<1
Limits for Industrial, Residential, Rural and other Areas	80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Concentration					
	Lead (Pb), µg/m³	Nickel (Ni), ng/m³	Arsenic (As), ng/m³	Benzo(a)Pyrene (BaP), ng/m³	Carbon Monoxide* (CO), mg/m³	Ozone* (O_3), µg/m³
04.12.2020	0.18	<0.5	<0.5	<0.5	0.33	25
05.12.2020	0.09	<0.5	<0.5	<0.5	0.13	22
11.12.2020	0.11	<0.5	<0.5	<0.5	0.28	20
12.12.2020	0.13	<0.5	<0.5	<0.5	0.22	21
18.12.2020	0.06	<0.5	<0.5	<0.5	0.15	20
19.12.2020	0.09	<0.5	<0.5	<0.5	0.23	20
18.12.2020	0.08	<0.5	<0.5	<0.5	0.15	20
26.12.2020	0.05	<0.5	<0.5	<0.5	0.13	30
30.12.2020	0.20	<0.5	<0.5	<0.5	0.14	21
31.12.2020	0.12	<0.5	<0.5	<0.5	0.09	25
Limits for Industrial, Residential, Rural and other Areas	1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for a period of 1 hr

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
HEAD OF LABORATORY

MINERAL ENGINEERING SERVICES

(Recognised by GOI, MoEF&CC under E(P) Act 1986 Vide Gazette Notification No. S.O. 857 (E) dated 26.02.2018. Recognition valid upto 25.02.2023

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Table No. 20

ANALYSIS REPORT OF AMBIENT AIR QUALITY

MES/A/FTR/08/00

Project	: Zamblidadga Dongor Mine (ML No. 3/FeMn/79)
Client	: Shri. Naraina S. Quirtonim
Station at & Code	: A4 Maina village
Month	: 24 Hrs
Duration	: December, 2020
Date of Report	: 12.01.2021
Reference IS 5182	

Date of Sampling	Concentration					
	Sulphur Dioxide (SO_2), $\mu g/m^3$	Nitrogen Dioxide (NO_2), $\mu g/m^3$	PM_{10}, ($\mu g/m^3$)	$PM_{2.5}$, ($\mu g/m^3$)	Ammonia (NH_3), $\mu g/m^3$	Benzene (C_6H_6), $\mu g/m^3$
04.12.2020	10	11	47	25	<20	<1
05.12.2020	12	13	53	27	<20	<1
11.12.2020	7	9	36	17	<20	<1
12.12.2020	9	11	43	24	<20	<1
18.12.2020	11	13	38	20	<20	<1
19.12.2020	9	11	41	25	<20	<1
25.12.2020	7	9	38	22	<20	<1
26.12.2020	11	13	46	22	<20	<1
30.12.2020	6	10	42	24	<20	<1
31.12.2020	10	11	39	22	<20	<1
Limits for Industrial , Residential, Rural and other Areas	80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Concentration					
	Lead (Pb), $\mu g/m^3$	Nickel (Ni), ng/m^3	Arsenic (As), ng/m^3	Benzo(a)Pyrene (BaP), ng/m^3	Carbon Monoxide* (CO), mg/m^3	Ozone* (O_3), $\mu g/m^3$
04.12.2020	0.08	<0.5	<0.5	<0.5	0.33	20
05.12.2020	0.08	<0.5	<0.5	<0.5	0.15	25
11.12.2020	0.08	<0.5	<0.5	<0.5	0.08	21
12.12.2020	0.13	<0.5	<0.5	<0.5	0.24	20
18.12.2020	0.70	<0.5	<0.5	<0.5	0.31	22
19.12.2020	0.08	<0.5	<0.5	<0.5	0.09	20
25.12.2020	0.11	<0.5	<0.5	<0.5	0.06	22
26.12.2020	0.06	<0.5	<0.5	<0.5	0.25	20
30.12.2020	0.20	<0.5	<0.5	<0.5	0.22	24
31.12.2020	0.06	<0.5	<0.5	<0.5	0.06	20
Limits for Industrial , Residential, Rural and other Areas	1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for a period of 1 hr

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
HEAD OF LABORATORY

25/XXV, Club Road, Ballari - 583 103. Karnataka. Landline No. : 08392-267421.

E-mail : mes_msraju@yahoo.co.uk
mesbly25@gmail.com

Website : www.envtest.com

Table No. 21

ANALYSIS REPORT OF AMBIENT AIR QUALITY

MES/A/FTR/08/00

Project	: Zamblidadga Dongor Mine (ML No. 3/FeMn/79)
Client	: Shri. Naraina S. Quirtonim
Station at & Code	: A5 Khadde village
Month	: 24 Hrs
Duration	: December, 2020
Date of Report	: 12.01.2021
Reference IS 5182	

Date of Sampling	Concentration					
	Sulphur Dioxide (SO_2), µg/m³	Nitrogen Dioxide (NO_2), µg/m³	PM_{10}, (µg/m³)	$PM_{2.5}$, (µg/m³)	Ammonia (NH_3), µg/m³	Benzene (C_6H_6), µg/m³
04.12.2020	9	10	45	26	<20	<1
05.12.2020	13	14	35	23	<20	<1
11.12.2020	7	9	49	29	<20	<1
12.12.2020	10	16	44	20	<20	<1
18.12.2020	8	12	48	29	<20	<1
19.12.2020	10	15	53	28	<20	<1
25.12.2020	9	13	41	23	<20	<1
26.12.2020	12	10	55	37	<20	<1
30.12.2020	6	11	32	20	<20	<1
31.12.2020	8	12	52	24	<20	<1
Limits for Industrial , Residential, Rural and other Areas	80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Concentration					
	Lead (Pb), µg/m³	Nickel (Ni), ng/m³	Arsenic (As), ng/m³	Benzo(a)Pyrene (BaP), ng/m³	Carbon Monoxide* (CO), mg/m³	Ozone* (O_3), µg/m³
04.12.2020	0.05	<0.5	<0.5	<0.5	0.06	21
05.12.2020	0.22	<0.5	<0.5	<0.5	0.09	25
11.12.2020	0.16	<0.5	<0.5	<0.5	0.22	29
12.12.2020	0.06	<0.5	<0.5	<0.5	0.25	20
18.12.2020	0.07	<0.5	<0.5	<0.5	0.06	21
19.12.2020	0.05	<0.5	<0.5	<0.5	0.06	23
25.12.2020	0.05	<0.5	<0.5	<0.5	0.06	20
26.12.2020	0.19	<0.5	<0.5	<0.5	0.18	<20
30.12.2020	0.08	<0.5	<0.5	<0.5	0.05	23
31.12.2020	0.26	<0.5	<0.5	<0.5	0.14	20
Limits for Industrial , Residential, Rural and other Areas	1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for a period of 1 hr

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
HEAD OF LABORATORY

MINERAL ENGINEERING SERVICES

(Recognised by GOI, MoEF&CC under E(P) Act 1986 Vide Gazette Notification No. S.O. 857 (E) dated 26.02.2018. Recognition valid upto 25.02.2023

ISO9001:2015
OHSAS (ISO 45001:2018)

Table No. 22

ANALYSIS REPORT OF AMBIENT AIR QUALITY

MES/A/FTR/08/00

Project	: Zamblidadga Dongor Mine (ML No. 3/FeMn/79)
Client	: Shri. Naraina S. Quirtonim
Station at & Code	: A6 Bendode village
Month	: 24 Hrs
Duration	: December, 2020
Date of Report	: 12.01.2021
Reference IS 5182	

Date of Sampling	Concentration					
	Sulphur Dioxide (SO_2), µg/m³	Nitrogen Dioxide (NO_2), µg/m³	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	Ammonia (NH_3), µg/m³	Benzene (C_6H_6), µg/m³
30.11.2020	7	9	36	21	<20	<1
01.12.2020	12	14	50	26	<20	<1
07.12.2020	10	13	39	20	<20	<1
08.12.2020	8	9	48	22	<20	<1
14.12.2020	11	12	34	19	<20	<1
15.12.2020	9	11	48	25	<20	<1
21.12.2020	10	12	50	25	<20	<1
22.12.2020	12	14	46	25	<20	<1
28.12.2020	9	11	40	22	<20	<1
29.12.2020	11	14	56	30	<20	<1
Limits for Industrial, Residential, Rural and other Areas	80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Concentration					
	Lead (Pb), µg/m³	Nickel (Ni), ng/m³	Arsenic (As), ng/m³	Benzo(a)Pyrene (BaP), ng/m³	Carbon Monoxide* (CO), mg/m³	Ozone* (O_3), µg/m³
30.11.2020	0.08	<0.5	<0.5	<0.5	0.22	22
01.12.2020	0.11	<0.5	<0.5	<0.5	0.09	25
07.12.2020	0.09	<0.5	<0.5	<0.5	0.08	<20
08.12.2020	0.06	<0.5	<0.5	<0.5	0.19	21
14.12.2020	0.07	<0.5	<0.5	<0.5	0.11	20
15.12.2020	0.09	<0.5	<0.5	<0.5	0.12	22
21.12.2020	0.06	<0.5	<0.5	<0.5	0.12	25
22.12.2020	0.11	<0.5	<0.5	<0.5	0.08	23
28.12.2020	0.13	<0.5	<0.5	<0.5	0.15	24
29.12.2020	0.06	<0.5	<0.5	<0.5	0.24	26
Limits for Industrial, Residential, Rural and other Areas	1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for a period of 1 hr

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
HEAD OF LABORATORY

25/XXV, Club Road, Ballari - 583 103. Karnataka. Landline No. : 08392-267421.

E-mail : mes_msraju@yahoo.co.uk
mesbly25@gmail.com

Website : www.envtest.com

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ISO9001:2015
OHSAS (ISO 45001:2018)

Table No. 23

ANALYSIS REPORT OF AMBIENT AIR QUALITY

MES/AFTR/08/00

Project	: Zamblidadga Dongor Mine (ML No. 3/FeMn/79)
Client	: Shri. Naraina S. Quirtonim
Station at & Code	: A7 Revona village
Month	: 24 Hrs
Duration	: December, 2020
Date of Report	: 12.01.2021
Reference IS 5182	

Date of Sampling	Concentration					
	Sulphur Dioxide (SO_2), µg/m³	Nitrogen Dioxide (NO_2), µg/m³	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	Ammonia (NH_3), µg/m³	Benzene (C_6H_6), µg/m³
04.12.2020	10	2	51	19	<20	<1
05.12.2020	7	9	47	24	<20	<1
11.12.2020	9	11	42	23	<20	<1
12.12.2020	11	15	48	24	<20	<1
18.12.2020	8	10	30	18	<20	<1
19.12.2020	11	14	40	25	<20	<1
25.12.2020	8	11	53	27	<20	<1
26.12.2020	9	10	49	22	<20	<1
30.12.2020	9	13	38	17	<20	<1
31.12.2020	11	16	50	26	<20	<1
Limits for Industrial , Residential, Rural and other Areas	80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Concentration					
	Lead (Pb), µg/m³	Nickel (Ni), ng/m³	Arsenic (As), ng/m³	Benzo(a)Pyrene (BaP), ng/m³	Carbon Monoxide* (CO), mg/m³	Ozone* (O_3), µg/m³
04.12.2020	0.11	<0.5	<0.5	<0.5	0.16	21
05.12.2020	0.11	<0.5	<0.5	<0.5	0.33	26
11.12.2020	0.07	<0.5	<0.5	<0.5	0.06	20
12.12.2020	0.06	<0.5	<0.5	<0.5	0.35	26
18.12.2020	0.16	<0.5	<0.5	<0.5	0.35	24
12.12.2020	0.06	<0.5	<0.5	<0.5	0.35	26
25.12.2020	0.08	<0.5	<0.5	<0.5	0.07	21
26.12.2020	0.25	<0.5	<0.5	<0.5	0.08	24
30.12.2020	0.06	<0.5	<0.5	<0.5	0.30	23
31.12.2020	0.06	<0.5	<0.5	<0.5	0.08	20
Limits for Industrial , Residential, Rural and other Areas	1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr
Note : * Parameters monitored for a period of 1 hr						

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
HEAD OF LABORATORY

25/XXV, Club Road, Ballari - 583 103. Karnataka. Landline No. : 08392-267421.

E-mail : mes_msraju@yahoo.co.uk
mesbly25@gmail.com

Website : www.envtest.com

MINERAL ENGINEERING SERVICES

(Recognised by GOI, MoEF&CC under E(P) Act 1986 Vide Gazette Notification No. S.O. 857 (E) dated 26.02.2018. Recognition valid upto 25.02.2023

ISO9001:2015
OHSAS (ISO 45001:2018)

Table No. 24

ANALYSIS REPORT OF AMBIENT AIR QUALITY

MES/A/FTR/08/00

Project	: Zamblidadga Dongor Mine (ML No. 3/FeMn/79)
Client	: Shri. Naraina S. Quirtonim
Station at & Code	: A8 Pirla village
Month	: 24 Hrs
Duration	: December, 2020
Date of Report	: 12.01.2021
Reference IS 5182	

Date of Sampling	Concentration					
	Sulphur Dioxide (SO_2), µg/m³	Nitrogen Dioxide (NO_2), µg/m³	PM_{10}, (µg/m³)	$PM_{2.5}$, (µg/m³)	Ammonia (NH_3), µg/m³	Benzene (C_6H_6), µg/m³
30.11.2020	7	12	33	20	<20	<1
01.12.2020	9	11	28	18	<20	<1
07.12.2020	11	13	48	21	<20	<1
08.12.2020	9	11	38	26	<20	<1
14.12.2020	9	12	48	25	<20	<1
15.12.2020	8	9	37	23	<20	<1
21.12.2020	12	13	50	25	<20	<1
22.12.2020	6	9	33	22	<20	<1
28.12.2020	10	16	43	26	<20	<1
29.12.2020	8	9	25	18	<20	<1
Limits for Industrial, Residential, Rural and other Areas	80 24 Hrs	80 24 Hrs	100 24 Hrs	60 24 Hrs	400 24 Hrs	5 Annual

Date of Sampling	Concentration					
	Lead (Pb), µg/m³	Nickel (Ni), ng/m³	Arsenic (As), ng/m³	Benzo(a)Pyrene (BaP), ng/m³	Carbon Monoxide* (CO), mg/m³	Ozone* (O_3), µg/m³
30.11.2020	0.06	<0.5	<0.5	<0.5	0.18	25
01.12.2020	0.11	<0.5	<0.5	<0.5	0.16	20
07.12.2020	0.05	<0.5	<0.5	<0.5	0.06	21
08.12.2020	0.08	<0.5	<0.5	<0.5	0.16	20
14.12.2020	0.15	<0.5	<0.5	<0.5	0.21	20
08.12.2020	0.08	<0.5	<0.5	<0.5	0.16	20
21.12.2020	0.08	<0.5	<0.5	<0.5	0.30	20
22.12.2020	0.08	<0.5	<0.5	<0.5	0.25	22
28.12.2020	0.05	<0.5	<0.5	<0.5	0.35	20
29.12.2020	0.17	<0.5	<0.5	<0.5	0.31	22
Limits for Industrial, Residential, Rural and other Areas	1.0 24 Hrs	20 Annual	6 Annual	1 Annual	4 1 Hr	180 1 Hr

Note : * Parameters monitored for a period of 1 hr

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
HEAD OF LABORATORY

25/XXV, Club Road, Ballari - 583 103. Karnataka. Landline No. : 08392-267421.

E-mail : mes_msraju@yahoo.co.uk
mesbly25@gmail.com

Website : www.envtest.com

Table No. 25

STATISTICAL AMBIENT AIR QUALITY DATA

Project : Zamblidadga Dongor Mine (ML No. 3/FeMn/79)
Client : Shri. Naraina S. Quirtonim
Season : Post Monsoon, 2020 (October to December, 2020)

Station Code : A1 Out side the ML Area in N direction (Mllikarjuna Temple)					A2 Kavarem village				A3 Shinshore village			
	SO_2	NO_2	PM_{10}	$PM_{2.5}$	SO_2	NO_2	PM_{10}	$PM_{2.5}$	SO_2	NO_2	PM_{10}	$PM_{2.5}$
Min.	6	9	28	17	6	9	30	17	6	9	30	15
10%	6	9	30	18	8	10	34	19	7	9	35	18
25%	7	10	34	19	8	10	37	20	8	9	38	20
50%	9	11	38	20	9	12	40	22	9	11	42	24
75%	11	12	41	23	10	14	48	26	10	12	46	26
98%	12	14	50	26	13	17	55	41	12	16	52	29
Max.	12	14	50	26	13	17	56	42	12	17	53	29
Avg.	9	11	38	21	9	12	42	24	9	11	42	23
SD	2	2	6	3	2	2	7	6	2	2	6	4
No. of obs	26				26				26			

Station Code : A4 Maina village					A5 Khadde village				A6 Bendode village			
	SO_2	NO_2	PM_{10}	$PM_{2.5}$	SO_2	NO_2	PM_{10}	$PM_{2.5}$	SO_2	NO_2	PM_{10}	$PM_{2.5}$
Min.	6	9	35	17	6	9	32	20	7	9	34	17
10%	6	9	36	18	7	9	36	20	8	9	37	19
25%	7	10	38	21	8	10	40	22	8	11	39	20
50%	9	11	42	23	9	12	45	24	10	12	46	24
75%	10	12	46	25	10	14	49	27	11	14	50	26
98%	12	14	53	29	13	16	56	33	12	16	56	30
Max.	12	14	53	29	13	16	56	37	12	16	56	30
Avg.	9	11	43	23	9	12	45	25	10	12	45	23
SD	2	2	5	3	2	2	7	4	2	2	7	4
No. of obs	26				26				26			

Station Code : A7 Revona village					A8 Pirla village			
	SO_2	NO_2	PM_{10}	$PM_{2.5}$	SO_2	NO_2	PM_{10}	$PM_{2.5}$
Min.	7	2	30	17	6	9	25	16
10%	8	9	37	18	6	9	33	19
25%	9	11	41	22	7	9	36	20
50%	10	12	48	25	9	11	40	22
75%	11	13	50	27	9	12	46	26
98%	13	16	56	31	12	15	50	28
Max.	13	16	56	32	12	16	50	28
Avg.	10	12	46	24	8	11	40	23
SD	2	3	7	4	2	2	7	3
No. of obs	26				26			

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
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ISO9001:2015
OHSAS (ISO 45001:2018)

Table No. 26

WATER ANALYSIS REPORT

MESEL/W/FORM/09/00

Name of the Project : Zamblidadga Dongor Mine (ML No. 3/FeMn/79)
Name of the Client : Shri. Naraina S. Quirtonim
Month : Post Monsoon, 2020
Date of sampling : 10.12.2020
Date of Report : 12.01.2021
Ref:IS : 2296, 1982 Class C Norms (Stream Water Standards)

Sl.No.	Parameters	Method of Testing	Limits For Stream Water Standards	Sample			
				SW1	SW2	SW3	SW4
i	pH	IS:3025(Part-11)	6.5 to 8.5	6.91	6.91	7.56	7.48
ii	Dissolved Oxygen (as O_2), mg/l, Min	IS:3025(Part-38)	4	5.4	5.4	5.6	5.5
ii	Biochemical Oxygen Demand (as O_2), mg/l, Max	IS:3025(Part-44)	3	1.3	1.3	1.5	1.8
iv	Total Coliform (mpn/100ml), Max	IS:1622	5000	40	40	32	61
v	Colour (Hazen Units), Max	IS:3025(Part-4)	300	5	5	5	5
vi	Fluoride (as F),mg/l, Max	IS:3025(Part-60)	1.5	<0.1	<0.1	<0.1	0.42
vii	Cadmium (as Cd), mg/l, Max	IS:3025(Part-41)	0.01	<0.002	<0.002	<0.002	<0.002
viii	Chloride (as Cl),mg/l, Max	IS:3025(Part-32)	600	9.0	9.0	12.0	12.0
ix	Chromium (as Cr^{+6}), mg/l, Max	IS:3025(Part-52)	0.05	<0.03	<0.03	<0.03	<0.03
x	Cyanides (as CN), mg/l, Max	IS:3025(Part-27)	0.05	<0.01	<0.01	<0.01	<0.01
xi	Total Dissolved Solids (mg/l), Max	IS:3025(Part-16)	1500	44	44	52	166
xii	Selenium (as Se), mg/l, Max	IS:3025(Part-56)	0.05	<0.005	<0.005	<0.005	<0.005
xiii	Sulphates as SO_4 (mg/l), Max	IS:3025(Part-24)	400	1.9	1.9	1.0	<1
xiv	Lead (as Pb) mg/l, Max	IS:3025(Part-47)	0.1	<0.005	<0.005	<0.005	<0.005
xv	Copper (as Cu),mg/l, Max	IS:3025(Part-42)	1.5	<0.01	<0.01	<0.01	<0.01
xvi	Arsenic as As (mg/l), Max	IS:3025(Part-37)	0.2	<0.002	<0.002	<0.002	<0.002
xvii	Iron (as Fe),mg/l, MAX	IS:3025(Part-53)	50	<0.05	<0.05	<0.05	0.08
xviii	Phenolic compounds (as C_6H_5OH),mg/l, Max	IS:3025(Part-43)	0.005	<0.001	<0.001	<0.001	<0.001
xix	Zinc (as Zn),mg/l, Max	IS:3025(Part-49)	15	<0.005	<0.005	<0.005	<0.005
xx	Insecticides, mg/l, Max	APHA 21st	Absent	NA	NA	NA	NA
xxi	Anionic detergents (as MBAS),mg/l, Max	Annex K of IS 13248	1	<0.1	<0.1	<0.1	<0.1
xxii	Oils and grease, mg/l, Max	IS:3025(Part-39)	0.1	<0.01	<0.01	<0.01	<0.01
xxiii	Nitrates (as NO_3),mg/l, Max	IS:3025(Part-34)	50	1.37	1.37	0.92	0.1
xxiv	Alpha Emitters (µcurie/ml), Max	APHA 21st	10^{-9}	NA	NA	NA	NA
xxv	Beta Emitters (µcurie/ml), Max	APHA 21st	10^{-9}	NA	NA	NA	NA

SAMPLE CODE : Note : NA - Not Analysed
SW1 - Spring water Within ML Area
SW2 - Down Stream of Seasonal Nallah Water
SW3 - Kushawati River Near Kevona village
SW4 - Carka River Water
Samples collected & analysed : Mineral Engineering Services, Ballari Note : NA - Not Analysed

(M.R. DURGA PRASAD)
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(M.S. RAJU)
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E-mail : mes_msraju@yahoo.co.uk
mesbly25@gmail.com

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NABET

ISO9001:2015
OHSAS (ISO 45001:2018)

Table No. 27

WATER ANALYSIS REPORT

MESEL/W/FORM/10/

Name of the Project	: Zamblidadga Dongor Mine (ML No. 3/FeMn/79)
Name of the Client	: Shri. Naraina S. Quirtonim
Month	: Post Monsoon, 2020
Date of sampling	: 11.12.2020
Date of Report	: 12.01.2021

Ref : IS:10500-2012 Norms (Drinking Water Standards)

Sl. No.	Parameters	Method of Testing	Desirable Limits	Permissible Limits	Result		
					GW1	GW2	GW3
i	Colour (Hazen Units), Max	IS:3025 (Part-4)	5	15	<1	<1	<1
ii	Odour	IS:3025 (Part-5)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
iii	pH	IS:3025 (Part-11)	6.5 to 8.5	6.5 - 8.5	5.62	6.97	7.10
iv	Taste	IS:3025 (Part- 8)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
v	Turbidity,NTU, Max	IS:3025 (Part-10)	1	5	1.6	0.3	0.2
vi	Total Dissolved Solids,mg/l, Max	IS:3025 (Part-16)	500	2000	22	30	120
vii	Aluminium (as Al), Max	IS:3025 (Part-55)	0.03	0.2	<0.01	<0.01	<0.01
viii	Ammonia (as total Ammonia -N),mg/l, Max	IS:3025 (Part-34)	0.5	0.5	<0.1	<0.1	<0.1
ix	Anionic Detergents (as MBAS),mg/l , Max	Annex K of Is:13428	0.2	1.0	<0.1	<0.1	<0.1
x	Barium (as Ba), mg/l, Max	IS:15302 & APHA 21st	0.7	0.7	<0.5	<0.05	<0.05
xi	Boron (as B), mg/l, Max	IS:3025 (Part-57)	0.5	1	<0.1	<0.1	<0.1
xii	Calcium (as Ca),mg/l, Max	IS:3025 (Part-40)	75	200	2.4	2.4	23.0
xiii	Chloramines (as Cl_2), mg/l. Max	APHA 21st	4.0	4.0	NA	NA	NA
xiv	Chloride as Cl (mg/l),mg/l, Max	IS:3025 (Part-32)	250	1000	12.0	8.0	11.0
xv	Copper (as Cu),mg/l, Max	IS:3025 (Part-42)	0.05	1.5	<0.01	<0.01	<0.01
xvi	Fluoride (as F),mg/l, Max	IS:3025 (Part-60)	1	1.5	<0.1	0.54	<0.1
xvii	Residual, Free Chlorine,mg/l, Max	IS:3025 (Part-26)	0.2	1	<0.1	<0.1	<0.1
xviii	Iron (as Fe),mg/l, Max	IS:3025 (Part-53)	1.0	1.0	<0.05	<0.05	0.06
xix	Magnesium (as Mg)mg/l, Max	IS:3025 (Part-46)	30	100	1.9	1.0	4.8
xx	Manganese (as Mn),mg/l, Max	IS:3025 (Part-59)	0.1	0.3	<0.03	<0.03	<0.03
xxi	Mineral Oil,mg/l, Max	Clause 6 of IS 3025 (part -39)	0.5	0.5	<0.01	<0.01	<0.01
xxii	Nitrates (as NO_3),mg/l, Max	IS:3025 (Part-34)	45	45	<0.1	5.5	0.6
xxiii	Phenolics (as C_6H_5OH),mg/l, Max	IS:3025 (Part-43)	0.001	0.002	<0.001	<0.001	<0.001
xxiv	Selenium (as Se),mg/l, Max	IS:3025 (Part-56)	0.01	0.01	<0.005	<0.005	<0.005
xxv	Silver (as Ag), mg/l. Max	Annex J of Is:13428	0.1	0.1	<0.002	<0.002	<0.002
xxvi	Sulphates (as SO_4),mg/l, Max	IS:3025 (Part-24)	200	400	1.5	2.3	1.4
xxvii	Sulphide (as H_2S) , mg/l. Max	IS:3025 (Part-29)	0.05	0.05	<0.01	<0.01	<0.01
xxviii	Alkalinity (as $CaCO_3$) mg/l, Max	IS:3025 (Part-23)	200	600	4	12	80
xxix	Total Hardness (as $CaCO_3$),mg/l, Max	IS:3025 (Part-21)	200	600	14	10	78
xxx	Zinc (as Zn),mg/l, Max	IS:3025 (Part-49)	5	15	<0.005	<0.005	<0.005
xxxi	Cadmium (as Cd),mg/l, Max	IS:3025 (Part-41)	0.003	0.003	<0.002	<0.002	<0.002
xxxii	Cyanide (as CN),mg/l, Max	IS:3025 (Part-27)	0.05	0.05	<0.01	<0.01	<0.01
xxxiii	Lead (as Pb),mg/l, Max	IS:3025 (Part-47)	0.01	0.01	<0.005	<0.005	<0.005
xxxiv	Molybdenum (as Mo), mg/l, Max	APHA 21st	0.07	0.07	NA	NA	NA
xxxv	Mercury (as Hg),mg/l, Max	IS:3025 (Part-48)	0.001	0.001	<0.0005	<0.0005	<0.0005
xxxvi	Nickel (as Ni),mg/l, Max	IS:3025 (Part-54)	0.02	0.02	<0.01	<0.01	<0.01
xxxvii	Pesticides,mg/l, Max	APHA 21st	Absent	0.001	NA	NA	NA
xxxviii	Polychlorinated biphenyls mg/l, Max	APHA 21st Edition	0.0005	0.0005	NA	NA	NA
xxix	Polynuclear Aromatic Hydrocarbons (as PAH),mg/l, Max	APHA 21st Edition	0.0001	0.0001	NA	NA	NA
XL	Arsenic (as As),mg/l, Max	IS:3025 (Part-37)	0.01	0.01	<0.002	<0.002	<0.002
XLI	Chromium (as Cr^{+6}),mg/l, Max	IS:3025 (Part-52)	0.05	0.05	<0.03	<0.03	<0.03
XLii	Trihalomethanes,mg/l, Max	APHA 21st	--	--	NA	NA	NA
XLiii	Radioactive materials,Bq/l,mg/l	APHA 21st	--	--	NA	NA	NA
XLiv	Total Coliform (/100ml)	IS:1622	Absent	Absent	Absent	Absent	Absent
XLv	E-Coli (cfu/100ml)	IS:1622	Absent	Absent	Absent	Absent	Absent
XLvi	Water levels in well from surface (m)	--	--	--	3.10	6.40	7.60

SAMPLE TYPE : GW1 - Well water Kavarem village, GW2 - Well water Muryem village, GW3 - Well water Maina village

Samples Collected & Analysed by Mineral Engineering Services, Ballari NA - Not Analysed

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
HEAD OF LABORATORY

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MTIC INTERCERT

ISO9001:2015
OHSAS (ISO 45001:2018)

Table No. 28

WATER ANALYSIS REPORT

MESE/LAW/FORM/10A

Name of the Project	: Zamblidadga Dongor Mine (ML No. 3/FeMn/79)
Name of the Client	: Shri. Narasina S. Quirtonim
Month	: Post Monsoon, 2020
Date of sampling	: 11.12.2020
Date of Report	: 12.01.2021

Ref : IS:10500-2012 Norms (Drinking Water Standards)

Sl. No.	Parameters	Method of Testing	Desirable Limits	Permissible Limits	Result		
					GW4	GW5	GW6
i	Colour (Hazen Units), Max	IS:3025 (Part-4)	5	15	<1	1	1
ii	Odour	IS:3025 (Part-5)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
iii	pH	IS:3025 (Part-11)	6.5 to 8.5	6.5 - 8.5	6.8/5	7.05	6.90
iv	Taste	IS:3025 (Part- 8)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
v	Turbidity,NTU, Max	IS:3025 (Part-10)	1	5	1.8	4.5	1.6
vi	Total Dissolved Solids,mg/l, Max	IS:3025 (Part-16)	500	2000	48	142	64
vii	Aluminium (as Al), Max	IS:3025 (Part-55)	0.03	0.2	<0.01	<0.01	<0.01
viii	Ammonia (as total Ammonia -N),mg/l, Max	IS:3025 (Part-34)	0.5	0.5	<0.1	<0.1	<0.1
ix	Anionic Detergents (as MBAS),mg/l , Max	Annex K of Is:13428	0.2	1.0	<0.1	<0.1	<0.1
x	Barium (as Ba), mg/l, Max	IS:15302 & APHA 21st	0.7	0.7	<0.5	<0.5	<0.5
xi	Boron (as B), mg/l, Max	IS:3025 (Part-57)	0.5	1	<0.1	<0.1	<0.1
xii	Calcium (as Ca),mg/l, Max	IS:3025 (Part-40)	75	200	8.0	35.3	9.6
xiii	Chloramines (as Cl_2), mg/l, Max	APHA 21st	4.0	4.0	NA	NA	NA
xiv	Chloride as Cl (mg/l),mg/l, Max	IS:3025 (Part-32)	250	1000	7.0	17.9	9.0
xv	Copper (as Cu),mg/l, Max	IS:3025 (Part-42)	0.05	1.5	<0.01	<0.01	<0.01
xvi	Fluoride (as F),mg/l, Max	IS:3025 (Part-60)	1	1.5	<0.1	<0.1	<0.1
xvii	Residual, Free Chlorine,mg/l, Max	IS:3025 (Part-26)	0.2	1	<0.1	<0.1	<0.1
xviii	Iron (as Fe),mg/l, Max	IS:3025 (Part-53)	1.0	1.0	<0.05	<0.05	<0.05
xix	Magnesium (as Mg)mg/l, Max	IS:3025 (Part-46)	30	100	4.9	11.2	3.4
xx	Manganese (as Mn),mg/l, Max	IS:3025 (Part-59)	0.1	0.3	<0.03	<0.03	<0.03
xxi	Mineral Oil,mg/l, Max	Clause 6 of IS 3025 (part -39)	0.5	0.5	<0.01	<0.01	<0.01
xxii	Nitrates (as NO_3),mg/l, Max	IS:3025 (Part-34)	45	45	1.7	7.0	5.1
xxiii	Phenolics (as C_6H_5OH),mg/l, Max	IS:3025 (Part-43)	0.001	0.002	<0.001	<0.001	<0.001
xxiv	Selenium (as Se),mg/l, Max	IS:3025 (Part-56)	0.01	0.01	<0.005	<0.005	<0.005
xxv	Silver (as Ag), mg/l, Max	Annex J of Is:13428	0.1	0.1	<0.002	<0.002	<0.002
xxvi	Sulphates (as SO_4),mg/l, Max	IS:3025 (Part-24)	200	400	7.3	6.6	14.6
xxvii	Sulphide (as H_2S) , mg/l, Max	IS:3025 (Part-29)	0.05	0.05	<0.01	<0.01	<0.01
xxviii	Alkalinity (as $CaCO_3$) mg/l, Max	IS:3025 (Part-23)	200	600	30	138	24
xxix	Total Hardness (as $CaCO_3$),mg/l, Max	IS:3025 (Part-21)	200	600	40	134	38
xxx	Zinc (as Zn),mg/l, Max	IS:3025 (Part-49)	5	15	<0.005	<0.005	<0.005
xxxi	Cadmium (as Cd),mg/l, Max	IS:3025 (Part-41)	0.003	0.003	<0.002	<0.002	<0.002
xxxii	Cyanide (as CN),mg/l, Max	IS:3025 (Part-27)	0.05	0.05	<0.01	<0.01	<0.01
xxxiii	Lead (as Pb),mg/l, Max	IS:3025 (Part-47)	0.01	0.01	<0.005	<0.005	<0.005
xxxiv	Molybdenum (as Mo), mg/l, Max	APHA 21st	0.07	0.07	NA	NA	NA
xxxv	Mercury (as Hg),mg/l, Max	IS:3025 (Part-48)	0.001	0.001	<0.0005	<0.0005	<0.0005
xxxvi	Nickel (as Ni),mg/l, Max	IS:3025 (Part-54)	0.02	0.02	<0.01	<0.01	<0.01
xxxvii	Pesticides mg/l, Max	APHA 21st	Absent	0.001	NA	NA	NA
xxxviii	Polychlorinated biphenyls mg/l, Max	APHA 21st Edition	0.0005	0.0005	NA	NA	NA
xxix	Polynuclear Aromatic Hydrocarbons (as PAH),mg/l, Max	APHA 21st Edition	0.0001	0.0001	NA	NA	NA
XL	Arsenic (as As),mg/l, Max	IS:3025 (Part-37)	0.01	0.01	<0.002	<0.002	<0.002
XLI	Chromium (as Cr^{+6}),mg/l, Max	IS:3025 (Part-52)	0.05	0.05	<0.03	<0.03	<0.03
XLii	Trihalomethanes,mg/l, Max	APHA 21st	--	--	NA	NA	NA
XLiii	Radioactive materials,Bq/l,mg/l	APHA 21st	--	--	NA	NA	NA
XLiv	Total Coliform (/100ml)	IS:1622	Absent	Absent	Absent	Absent	Absent
XLv	E-Coli (cfu/100ml)	IS:1622	Absent	Absent	Absent	Absent	Absent
XLvi	Water levels in well from surface (m)	--	--	--	--	--	4.80

SAMPLE TYPE : GW4 - Well water Khaddo village , GW5 - Well water Bendode village, GW6 - Well water Revona village

Samples Collected & Analysed by Mineral Engineering Services, Ballari NA - Not Analysed

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
HEAD OF LABORATORY

25/XXV, Club Road, Ballari - 583 103. Karnataka. Landline No. : 08392-267421.

E-mail : mes_msraju@yahoo.co.uk
mesbly25@gmail.com

Website : www.envtest.com

MINERAL ENGINEERING SERVICES

(Recognised by GOI, MoEF&CC under E(P) Act 1986 Vide Gazette Notification No. S.O. 857 (E) dated 26.02.2018. Recognition valid upto 25.02.2023

ISO9001:2015
OHSAS (ISO 45001:2018)

Table No. 29

WATER ANALYSIS REPORT

MESEL/WI/FORM/1C/00

Name of the Project	:	**Zamblidadga Dongor Mine (ML No. 3/FeMn/79)**
Name of the Client	:	**Shri. Naraina S. Quirtonim**
Month	:	**Post Monsoon, 2020**
Date of sampling	:	**11.12.2020**
Date of Report	:	**12.01.2021**

Ref : IS:10500-2012 Norms (Drinking Water Standards)

Sl. No.	Parameters	Method of Testing	Desirable Limits	Permissible Limits	Result	
					GW7	GW8
i	Colour (Hazen Units), Max	IS:3025 (Part-4)	5	15	<1	1
ii	Odour	IS:3025 (Part-5)	Agreeable	Agreeable	Agreeable	Agreeable
iii	pH	IS:3025 (Part-11)	6.5 to 8.5	6.5 - 8.5	5.45	6.62
iv	Taste	IS:3025 (Part- 8)	Agreeable	Agreeable	Agreeable	Agreeable
v	Turbidity,NTU, Max	IS:3025 (Part-10)	1	5	0.8	1.20
vi	Total Dissolved Solids,mg/l, Max	IS:3025 (Part-16)	500	2000	26	62
vii	Aluminium (as Al), Max	IS:3025 (Part-55)	0.03	0.2	<0.01	<0.01
viii	Ammonia (as total Ammonia -N),mg/l, Max	IS:3025 (Part-34)	0.5	0.5	<0.1	<0.1
ix	Anionic Detergents (as MBAS),mg/l , Max	Annex K of Is:13428	0.2	1.0	<0.1	<0.1
x	Barium (as Ba), mg/l, Max	IS:15302 & APHA 21st	0.7	0.7	<0.5	<0.5
xi	Boron (as B), mg/l, Max	IS:3025 (Part-57)	0.5	1	<0.1	<0.1
xii	Calcium (as Ca),mg/l, Max	IS:3025 (Part-40)	75	200	4.0	8.8
xiii	Chloramines (as Cl_2), mg/l. Max	APHA 21st	4.0	4.0	NA	NA
xiv	Chloride as Cl (mg/l),mg/l, Max	IS:3025 (Part-32)	250	1000	11.0	11.0
xv	Copper (as Cu),mg/l, Max	IS:3025 (Part-42)	0.05	1.5	<0.01	<0.01
xvi	Fluoride (as F),mg/l, Max	IS:3025 (Part-60)	1	1.5	<0.1	<0.1
xvii	Residual, Free Chlorine,mg/l, Max	IS:3025 (Part-26)	0.2	1	<0.1	<0.1
xviii	Iron (as Fe),mg/l, Max	IS:3025 (Part-53)	1.0	1.0	<0.05	<0.05
xix	Magnesium (as Mg)mg/l, Max	IS:3025 (Part-46)	30	100	2.4	4.9
xx	Manganese (as Mn),mg/l, Max	IS:3025 (Part-59)	0.1	0.3	<0.03	<0.03
xxi	Mineral Oil,mg/l, Max	Clause 6 of IS 3025 (part -39)	0.5	0.5	<0.01	<0.01
xxii	Nitrates (as NO_3),mg/l, Max	IS:3025 (Part-34)	45	45	<0.1	4.1
xxiii	Phenolics (as C_6H_5OH),mg/l, Max	IS:3025 (Part-43)	0.001	0.002	<0.001	<0.001
xxiv	Selenium (as Se),mg/l, Max	IS:3025 (Part-56)	0.01	0.01	<0.005	<0.006
xxv	Silver (as Ag), mg/l, Max	Annex J of Is:13428	0.1	0.1	<0.002	<0.002
xxvi	Sulphates (as SO_4),mg/l, Max	IS:3025 (Part-24)	200	400	1.7	12.0
xxvii	Sulphide (as H_2S) , mg/l, Max	IS:3025 (Part-29)	0.05	0.05	<0.01	<0.01
xxviii	Alkalinity (as $CaCO_3$) mg/l, Max	IS:3025 (Part-23)	200	600	4	32
xxix	Total Hardness (as $CaCO_3$),mg/l, Max	IS:3025 (Part-21)	200	600	20	42
xxx	Zinc (as Zn),mg/l, Max	IS:3025 (Part-49)	5	15	<0.005	<0.005
xxxi	Cadmium (as Cd),mg/l, Max	IS:3025 (Part-41)	0.003	0.003	<0.002	<0.002
xxxii	Cyanide (as CN),mg/l, Max	IS:3025 (Part-27)	0.05	0.05	<0.01	<0.01
xxxiii	Lead (as Pb),mg/l, Max	IS:3025 (Part-47)	0.01	0.01	<0.005	<0.005
xxxiv	Molybdenum (as Mo), mg/l, Max	APHA 21st	0.07	0.07	NA	NA
xxxv	Mercury (as Hg),mg/l, Max	IS:3025 (Part-48)	0.001	0.001	<0.0005	<0.0005
xxxvi	Nickel (as Ni),mg/l, Max	IS:3025 (Part-54)	0.02	0.02	<0.01	<0.01
xxxvii	Pesticides,mg/l, Max	APHA 21st	Absent	0.001	NA	NA
xxxviii	Polychlorinated biphenyls mg/l, Max	APHA 21st Edition	0.0005	0.0005	NA	NA
xxix	Polynuclear Aromatic Hydrocarbons (as PAH),mg/l, Max	APHA 21st Edition	0.0001	0.0001	NA	NA
XL	Arsenic (as As),mg/l, Max	IS:3025 (Part-37)	0.01	0.01	<0.002	<0.002
XLI	Chromium (as Cr^{+6}),mg/l, Max	IS:3025 (Part-52)	0.05	0.05	<0.03	<0.03
XLii	Trihalomethanes,mg/l, Max	APHA 21st	--	--	NA	NA
XLiii	Radioactive materials,Bq/l,mg/l	APHA 21st	--	--	NA	NA
XLiv	Total Coliform (/100ml)	IS:1622	Absent	Absent	Absent	Absent
XLv	E-Coli (cfu/100ml)	IS:1622	Absent	Absent	Absent	Absent
XLvi	Water levels in well from surface (m)	--	--	--	6.10	3.26

SAMPLE TYPE : GW7 - Well water Pirla village, GW8 - Well water Kevona village

Samples Collected & Analysed by Mineral Engineering Services, Ballari NA - Not Analysed

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
HEAD OF LABORATORY

25/XXV, Club Road, Ballari - 583 103. Karnataka. Landline No. : 08392-267421.

E-mail : mes_msraju@yahoo.co.uk
mesbly25@gmail.com

Website : www.envtest.com

Table No 30

NOISE LEVEL DATA

:SEL/N/FORM/02/00

Project	:	Zamblidadga Dongor Mine (ML No. 3/FeMn/79)
Client	:	Shri. Naraina S. Quirtonim
Season	:	Post Monsoon, 2020
Date of monitoring	:	10.12.2020 and 11.12.2020
Date of Report	:	12.01.2021

Code No.	Monitoring stations	Area				Night		
			L_{min}	L_{eq}	L_{max}	L_{min}	L_{eq}	L_{max}
N1	Core Zone ML Area	Industrial zone	41.0	48.6	56.4	34.0	39.9	47.6
N2	Kavarem village	Residential zone	39.8	46.1	50.5	34.5	36.9	40.0
N3	Shinshore village	Residential zone	36.0	46.7	52.5	35.0	40.9	45.3
N4	Maina village	Residential zone	39.9	44.7	47.5	34.0	35.6	38.0
N5	Khadde village	Residential zone	36.0	46.2	51.0	34.0	36.9	41.0
N6	Bendode village	Residential zone	36.0	47.8	53.4	34.0	37.8	42.0
N7	Revona village	Commercial zone	41.0	49.1	56.7	34.3	40.2	46.0
N8	Pirla village	Residential zone	39.0	46.3	50.3	34.3	37.7	41.5

Permissible Limits of Ambient Noise Levels as per CPCB Guidelines

	Leq. Limit dB(A)	
	Day	Night
Industrial areas	75	70
Commerecial area	65	55
Residential area	55	45
Silence Zone	50	40

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
HEAD OF LABORATORY

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NABET

MTIC INTERCERT

ISO9001:2015
OHSAS (ISO 45001:2018)

Table No. 31

SOIL ANALYSIS REPORT

MES/SOIL/FTR/03/00

Project	:	Zamblidadga Dongor Mine (ML No. 3/FeMn/79)
Client	:	Shri. Naraina S. Quirtonim
Date of sampling	:	Post Monsoon, 2020
Date of Report	:	12.11.2020
Report No.	:	12.01.2021

Test Method Reference IS 2720

SL. No.	PARAMETERS	Unit	S1	S2	S3	S4
PHYSICAL PROPERTIES						
1	Colour	--	Red	Red	Red	Red
2	Textural class	--	Silty Loam	Silty Clay	Silty Clay	Sand Loam
3	Size Distribution					
	Sand	%	55.6	8.8	20.13	52.5
	Slit	%	24.8	43.6	36.7	31.9
	Clay	%	19.6	47.6	43.2	15.6
4	Moisture Content	%	3.15	3.55	4.96	4.63
5	Bulk Density	gm/cc	1.66	1.82	1.67	1.62
6	Water holding capacity	%	31.2	27.11	30.42	20.00
7	pH	--	7.22	7.23	6.95	7.06
8	EC	m.mohs/cm	0.351	0.356	0.355	0.301
Chemcial Properties						
9	Organic Carbon	%	0.31	1.08	0.41	1.16
10	Nitrogen as N	Kg/Ha	255	175	211	108
11	Phosphorous as P	Kg/Ha	108	17	81	10.5
12	Potassium as K_2O	Kg/Ha	36	19	21	30
13	Sodium as Na	meq/100 gm	0.051	0.160	0.380	0.160
14	Chloride as Cl	%	0.19	0.24	0.28	0.13
15	Sulphate as SO_4	%	0.21	0.068	0.08	0.055

Sample Code :

S1 - Core Zone Within Ml Area Top Soil

S2 - Cordem RF area Near Khadde village

S3 - Kavarem village Agriculture soil

S4 - Rivona village Agriculture soil

(M.R. DURGA PRASAD)
GOVT. ANALYST

(M.S. RAJU)
HEAD OF LABORATORY

25/XXV, Club Road, Ballari - 583 103. Karnataka. Landline No. : 08392-267421.

E-mail : mes_msraju@yahoo.co.uk
mesbly25@gmail.com

Website : www.envtest.com

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NABET

MTIC INTERCERT

ISO9001:2015
OHSAS (ISO 45001:2018)

Table No. 32

SOIL ANALYSIS REPORT

MES/SOIL/FTR/03/00

Project	:	Zamblidadga Dongor Mine (ML No. 3/FeMn/79)
Client	:	Shri. Naraina S. Quirtonim
Date of sampling	:	Post Monsoon, 2020
Date of Report	:	12.11.2020
Report No.	:	12.01.2021
Test Method Reference		IS 2720

Sl. No.	PARAMETERS	Unit	S5	S6	S7
PHYSICAL PROPERTIES					
1	Colour	--	Red	Red	Red
2	Textural class	--	Silty Clay	Sand Loam	Silty Clay
3	Size Distribution				
	Sand	%	20.13	53.5	45.3
	Silt	%	36.7	29.0	38.6
	Clay	%	43.2	17.5	16.3
4	Moisture Content	%	4.96	4.96	4.56
5	Bulk Density	gm/cc	1.67	1.67	1.84
6	Water holding capacity	%	30.42	30.42	32.10
7	pH	--	6.95	7.15	7.22
8	EC	m.mohs/cm	0.355	0.315	0.325
Chemcial Properties					
9	Organic Carbon	%	0.41	1.11	1.12
10	Nitrogen as N	Kg/Ha	211	105	109
11	Phosphorous as P	Kg/Ha	81	12.5	13.1
12	Potassium as K_2O	Kg/Ha	21	28	31
13	Sodium as Na	meq/100 gm	0.380	0.250	0.261
14	Chloride as Cl	%	0.28	0.18	0.21
15	Sulphate as SO_4	%	0.08	0.036	0.041

Sample Code :

S5 - Kevona village Agriculture soil

S6 - Maina village Agriculture soil

S7 - Bendordem RF area Near Bendode village

(M.R. DURGA PRASAD)
GOVT. ANALYST

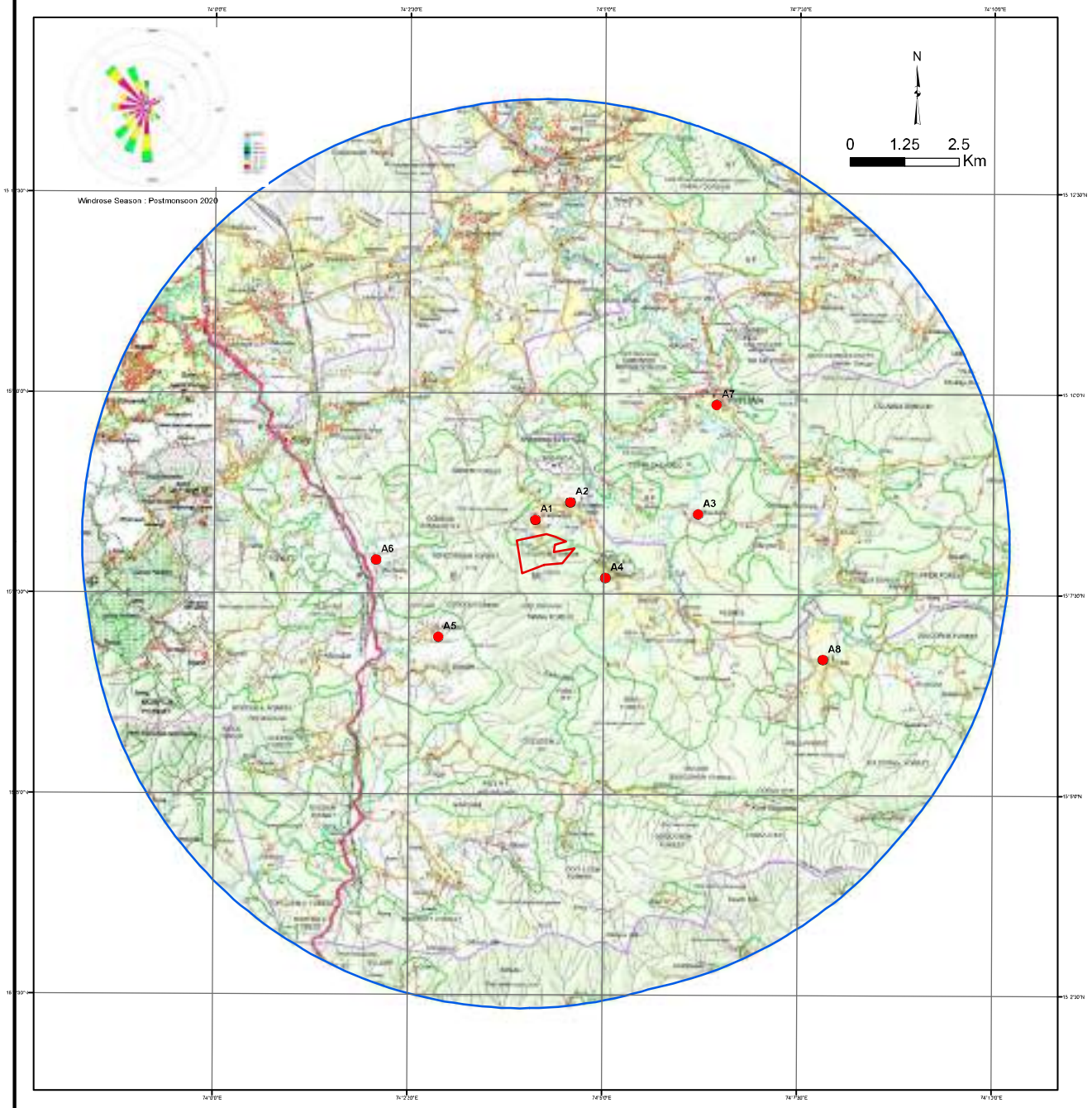
(M.S. RAJU)
HEAD OF LABORATORY

25/XXV, Club Road, Ballari - 583 103. Karnataka. Landline No. : 08392-267421.

E-mail : mes_msraju@yahoo.co.uk
mesbly25@gmail.com

Website : www.envtest.com

Plan Showing Air monitoring Locations



Sl. No	AAQ Code	Location of Air Monitoring Stations	Latitude	Longitude
1	A1	Out side the ML Area in N direction (Mllikarjuna Temple)	15° 08'25.54"N	74°0 4'7.06"E
2	A2	Kavarem village	15° 08' 38.79" N	74° 04' 34.15" E
3	A3	Shinshore village	15° 08' 29.89" N	74° 06' 12.48" E
4	A4	Maina village	15° 07' 42.15" N	74° 05' 01.18" E
5	A5	Khadde village	15° 06' 57.72" N	74° 02' 52.80" E
6	A6	Bendode village	15° 07' 55.25" N	74° 02' 04.52" E
7	A7	Revona village	15° 09' 51.86" N	74° 06' 26.56" E
8	A8	Pirla village	15° 06' 41.44" N	74° 07' 49.10" E

Legend
- 10km bufferzone
- Mining Lease Area
- Air Monitoring Location

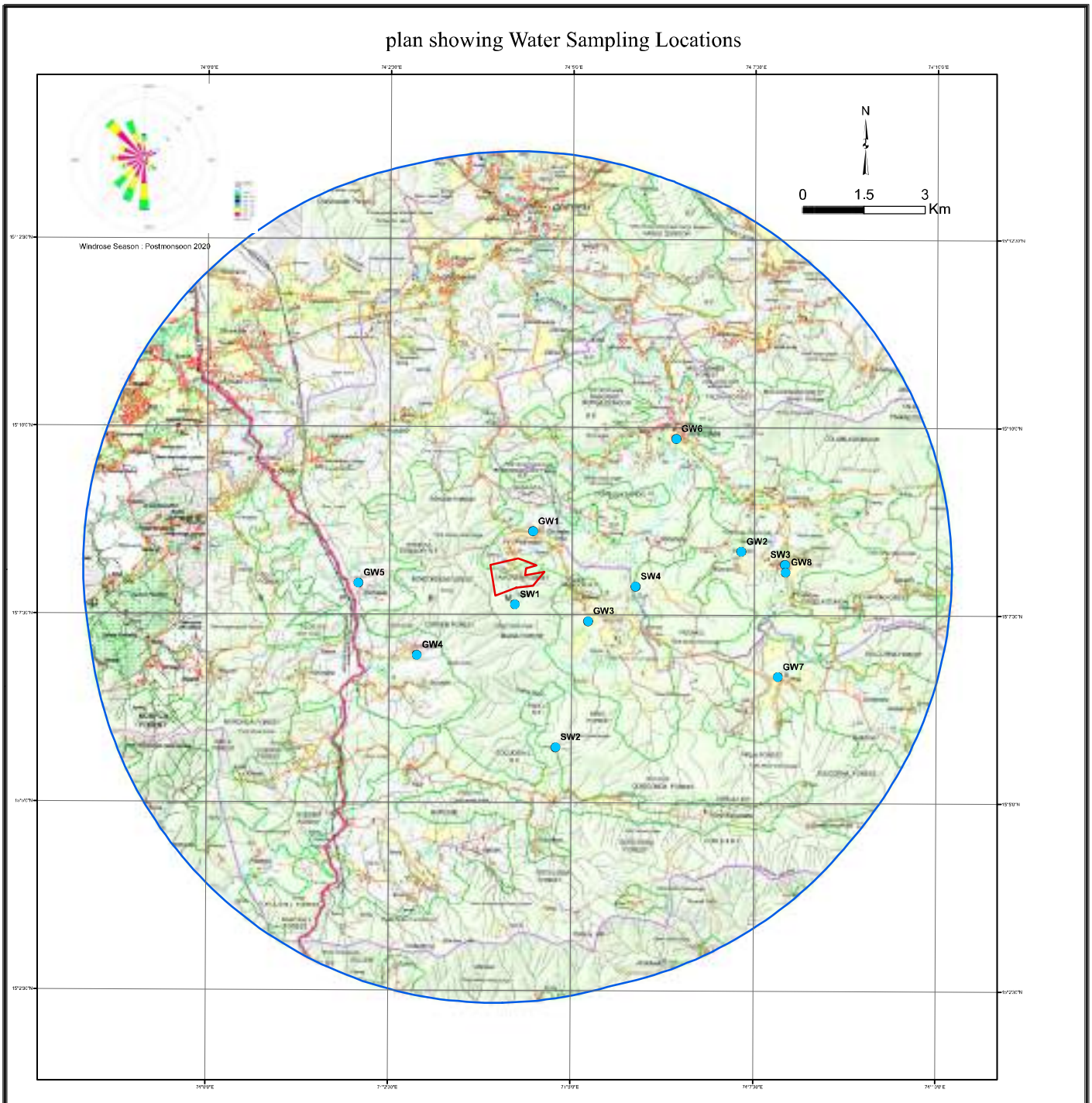
Mine : Zamblidadga Dongor Mine
Client :Shri Naraina S.Quirtonim

VILLAGE: Caurem TALUKA: Quepem
DISTRICT: South GOA STATE : GOA

ML.No 3/FeMn/79
EXTENT: 70.20 Ha

TITLE	KEY PLAN SHOWING MONITORING LOCATIONS	
SCALE	1:50,000	
Topo sheets No.	New D43C4 & D43B16	Old 48I/4 & 48E/16

plan showing Water Sampling Locations



Sl. No	Water sample	Water Sampling Location	Latitude	Longitude
1	SW1	Spring water Within ML Area	15° 07' 38.34" N	74° 04' 13.31" E
2	SW2	Down Stream of Seasonal Nallah Water	15° 05' 44.40" N	74° 04' 47.13" E
3	SW3	Kushawati River Water	15° 08' 10.68" N	74° 07' 55.24" E
4	SW4	Carka River Water	15° 07' 52.95" N	74° 05' 52.47" E
1	GW1	Kavarem village	15° 08' 36.75" N	74° 04' 27.99" E
2	GW2	Well water Muryem village	15° 08' 21.07" N	74° 07' 19.27" E
3	GW3	Maina village	15° 07' 25.15" N	74° 05' 13.53" E
4	GW4	Khadde village	15° 06' 57.72" N	74° 02' 52.80" E
5	GW5	Bendode village	15° 07' 55.25" N	74° 02' 04.52" E
6	GW6	Revona village	15° 09' 50.91" N	74° 06' 25.49" E
7	GW7	Pirla village	15° 06' 41.02" N	74° 07' 49.65" E
8	GW8	Well water Kevona village	15° 08' 04.58" N	74° 07' 55.76" E

Legend

- 10km bufferzone
- Mining Lease Area
- Water Sampling Location

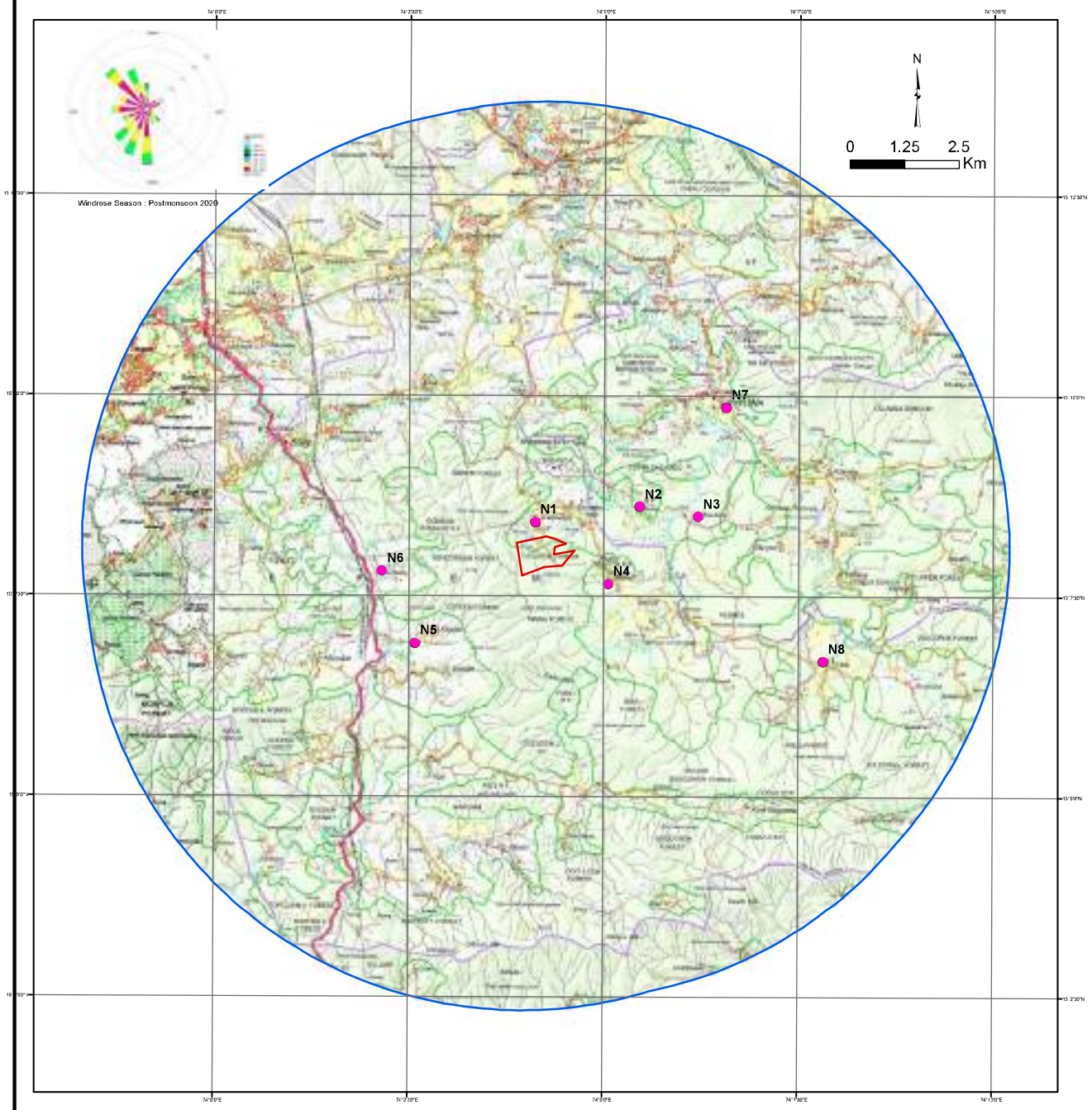
Mine : Zamblidadga Dongor Mine
Client :Shri Naraina S.Quirtonim

VILLAGE: Caurem TALUKA: Quepem
DISTRICT: South GOA STATE : GOA

ML.No 3/FeMn/79
EXTENT: 70.20 Ha

TITLE	KEY PLAN SHOWING MONITORING LOCATIONS	
SCALE	1:50,000	
Topo sheets No.	New D43C4 & D43B16	Old 48I/4 & 48E/16

Plan Showing Noise Monitoring Locations



Sl.No	Code	Location of Noise Monitoring Stations	Latitude	Longitude
1	N1	Out side the ML Area in N direction (Mllikarjuna Temple)	15° 08'25.54"N	74°0 4'7.06"E
2	N2	Kavarem village	15° 08' 37.26" N	74° 05' 27.57" E
3	N3	Shinshore village	15° 08' 29.89" N	74° 06' 12.48" E
4	N4	Maina village	15° 07' 39.37" N	74° 05' 03.45" E
5	N5	Khadde village	15° 06' 54.83" N	74° 02' 34.87" E
6	N6	Bendode village	15° 07' 48.89" N	74° 02' 09.02" E
7	N7	Revona village	15° 09' 51.54" N	74° 06' 34.16" E
8	N8	Pirla village	15° 06' 41.44" N	74° 07' 49.10" E

Legend
- 10km bufferzone
- Mining Lease Area
- Noise monitoring Location

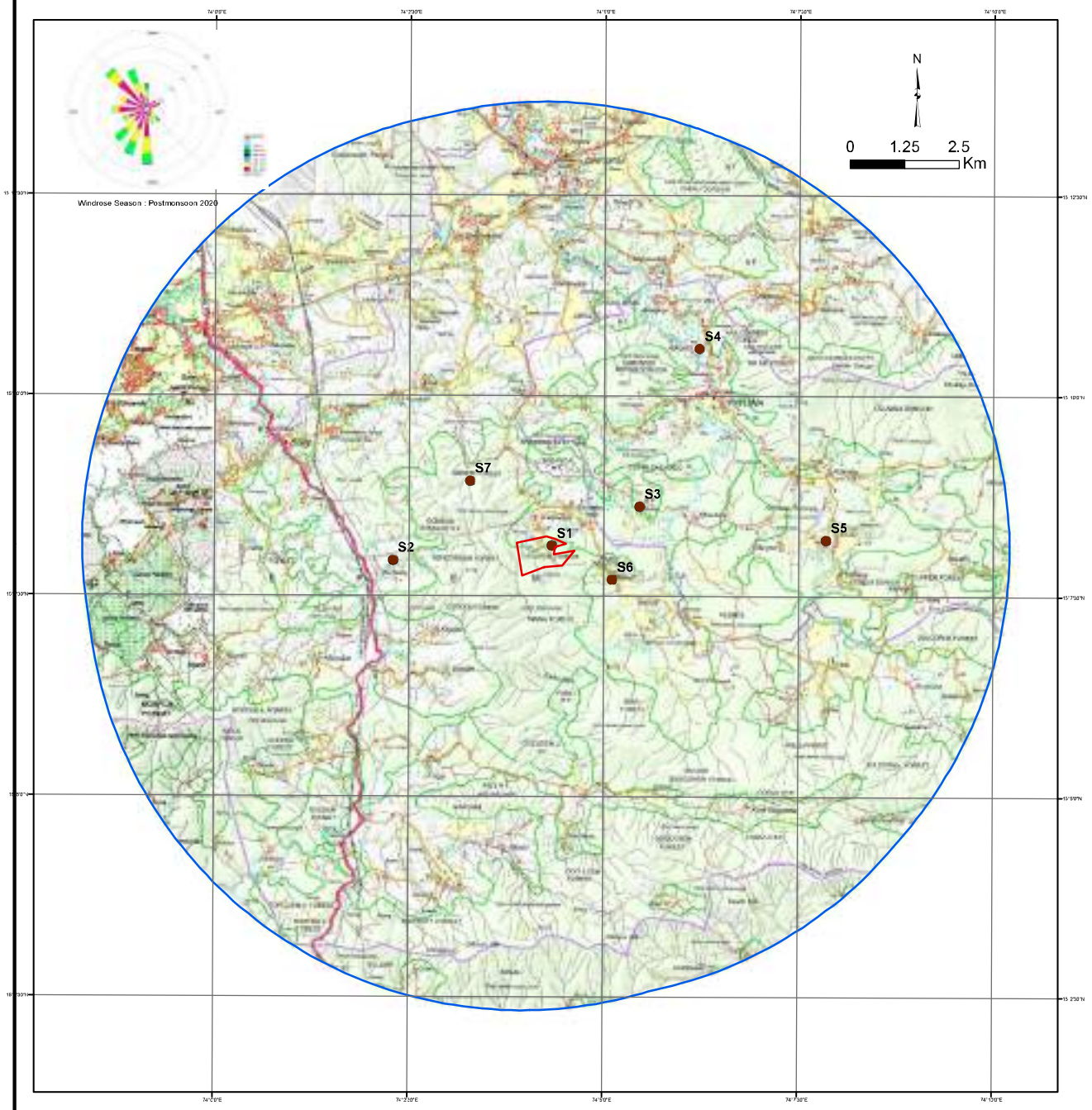
Mine : Zamblidadga Dongor Mine
Client :Shri Naraina S.Quirtonim

VILLAGE: Caurem TALUKA: Quepem
DISTRICT: South GOA STATE : GOA

ML.No 3/FeMn/79
EXTENT: 70.20 Ha

TITLE	KEY PLAN SHOWING MONITORING LOCATIONS	
SCALE	1:50,000	
Topo sheets No.	New D43C4 & D43B16	Old 48I/4 & 48E/16

Plan Showing Soil Sampling Locations



Sl. No	Code	Location of Soil Sampling Stations	Latitude	Longitude
1	S1	Core Zone Within Ml Area Top Soil	15° 08' 07.82" N	74° 04' 19.95" E
2	S2	Cordem RF area Near Khadde village	15° 07' 56.87" N	74° 02' 17.64" E
3	S3	Kavarem village Agriculture soil	15° 08' 37.26" N	74° 05' 27.57" E
4	S4	Rivona village Agriculture soil	15° 10' 35.53" N	74° 06' 13.39" E
5	S5	Kevona village Agriculture soil	15° 08' 12.21" N	74° 07' 51.10" E
6	S6	Maina village Agriculture soil	15° 07' 42.60" N	74° 05' 06.44" E
7	S7	Bendordem RF area Near Bendode village	15° 08' 56.31" N	74° 03' 16.79" E

Legend
- 10km bufferzone
- Mining Lease Area
- Soil Sampling Location

Mine : Zamblidadga Dongor Mine
Client :Shri Naraina S.Quirtonim

VILLAGE: Caurem TALUKA: Quepem
DISTRICT: South GOA STATE : GOA

ML.No 3/FeMn/79
EXTENT: 70.20 Ha

TITLE	KEY PLAN SHOWING MONITORING LOCATIONS	
SCALE	1:50,000	
Topo sheets No.	New D43C4 & D43B16	Old 48I/4 & 48E/16

FEASIBILITY REPORT

1. *Executive Summary*

Zamblidadga Dongor Iron and Manganese Ore Mine Mining Lease, bearing ML. No. 3/FeMn/79, over an area of 70.20Ha., located at Village Caurem, Taluka Quepem, District South Goa, State of Goa was originally granted to **Shri. Naraina Sinai Quirtonim** for Iron and Manganese Ores.

The entire lease area consisting of 70.20 Ha. is Forest land. There is an existing approach road from mining lease connecting to the Quepem – Pirla district road. This approach road passes through forest area.

The lessee undertook survey of the lease boundary pillars using Differential Global Positioning System (DGPS) by "Remote Sensing Instruments", Plot No. 7, Industrial Estate, Kukatpally, Hyderabad - 500072, which is an empaneled agency of Directorate of Mines and Geology, Government of Goa (DMG, Goa) vide Order No. 01/593/10-mines/203, dated 05-04-2013. The DGPS plan which admeasured the lease area of 70.20 Ha. was duly authenticated by the Directorate of Mines and Geology, Goa on 10-12-2021.

The lease is granted for Iron and Manganese Ore. Exploration has been carried out within the lease area during 2005-06 and about 14 boreholes were drilled with a total meterage of 431m. Additionally, geological mapping and sampling have been carried out. Based on the exploration data, exposures in the pits and as per as per the guidelines of Minerals (Evidence of Mineral Contents) Rules 2015 the Reserves and Resources are updated. There is about 4.336 million tonnes of Iron ore and about 0.032 million tonnes of Manganese ore within the lease area. The proposed production at this mine is planned at the rate of 0.5 million tonnes per annum of Iron Ore.

The potential area along with the entire mineralized area is proposed to be taken up for further exploration and based on the results, the Reserve and Resources will be timely updated.

2. ***Details of the Exploration Agency***

Shri. Naraina Sinai Quirtonim

Address: Mathura, H.No. 1153,
Near St. Joseph High School,
Aquem, Alto, Margao, Goa – 403601.

Telephone No: 9822210465

E-Mail i.d.: zmbdmine@gmail.com

3. ***Title and ownership***

Name of the Lessee: Late Shri. Naraina Sinai Quirtonim
Rep. by Smt. Pradnya Zoivant Pai Cano
(For self and on behalf of all other heirs
of Late. Shri Naraina Sinai Quirtonim
as their duly constituted attorney)

Telephone No: 9822210465

E-Mail i.d.: zmbdmine@gmail.com

Date of grant: 28-06-1979

Date of execution: 13-12-1979

Period of licence or lease: 50 years

Date of completion: 12-12-2029

4. *Details of the Area Under Study*

Lease Area :	70.20 Ha.
Mineral:	Iron Ore & Manganese Ore
Village:	Cavrem
Taluka:	Quepem
District:	South Goa
State:	Goa
Survey of India Toposheet No.:	48 I/4

The lease boundary pillar co-ordinates surveyed using DGPS are given below:

Pillar No.	**Pillar Latitude** *(dd:mm:ss.ss)*	**Pillar Longitude** *(dd:mm:ss.ss)*
BP-1	15° 08′ 9.378″	74° 04′ 30.733″
BP-2	15° 08′ 12.495″	74° 04′ 22.778″
BP-3	15° 08′ 14.725″	74° 04′ 15.586″
BP-4	15° 08′ 09.792″	74° 03′ 53.092″
BP-5	15° 07′ 45.289″	74° 03′ 56.971″
BP-6	15° 07′ 51.409″	74° 04′ 14.197″
BP-7	15° 07′ 53.039″	74° 04′ 28.142″
BP-8	15° 08′ 04.228″	74° 04′ 37.508″
BP-9	15° 08′ 01.482″	74° 04′ 21.392″
BP-10	15° 08′ 06.856″	74° 04′ 22.182″

Datum : WGS 84

5. *Physiography, Environment and Infrastructure*

The Mining Lease is located on a hilly undulating terrain. There are no surface water bodies within the lease. Due to the hilly topography, first order drains are observed flowing from the hill top downwards with dendritic drainage pattern. The highest elevation is more than 310m MSL and lowest is about 150m MSL. Karka Nallah flows at a distance of about 2 Km from the Mining Lease.

Details of Physiographic features and Infrastructures available in and around the lease/ block area are as follows:

Description	Within the Mining Lease	Distance from boundary periphery in kms	Remark if any
River/Nallah/Reservoir	Nil	2.0	Karka Nalla
Public roads (Tar road, cart road)	Nil	0.5	Quepem-Pirla Village road
Railway track	Nil	3.5	Bali Railway Tracks
Human settlements	Nil	0.25	Village Caurem
Archaeological monuments/ places of worships/public utilities etc.	Nil	0.37	Mallikarjun Temple
		2.0	Government Higher secondary School, Maina
		0.68	Panchayat & Health Centre, Caurem
Wild life sanctuaries/ national parks	Nil	Nil	----
Coastal Regulation Zone (CRZ)	Nil	Nil	----
Power transmission lines/telephone lines	Nil	0.25	In Village Caurem
Firing range	Nil	Nil	----
Ordinance factory	Nil	Nil	----
grazing land/ burial ground or cremation ground	Nil	1.5	In Village Caurem
Any other specify	Nil	Nil	----

Climatic conditions:

Temperature °C		**Relative Humidity %**	**Average Rainfall mm**
Maximum	Minimum	60-90%	4000mm
35°C	17°C		

Particulars	**Distance from lease boundary in kms**
Nearby village	0.68 km - Caurem Village
Nearest Railway station	4.98 km - Bali Railway Station
Nearest Port	40 km - Marmugao Port
Distance of SH/NH from lease area	3.4 km - NH66

6. Geology

Brief Regional Geology:

The Iron ore formations of Goa belong to Dharwar super group which consists of Vageri Formation, Bicholim Formation, Sanvordem Formation & Barcem Formation. All the formations are very important and from commercial point of view, it contains all the iron and manganese ore deposits of Goa, which is the backbone of Goa's economy. Bicholim formation overlies Sanvordem Formation conformably and it includes quartz chlorite, amphibolite schist, ferruginous pink phyllite, limestone and manganiferrous chert breccia with pink ferruginous phyllite and banded ferruginous quartzite's.

The formation extends NW-SE direction. Broadly the northern portion of the formation lying to the north of Usgao is rich in iron ore deposits, the southern portion of the deposits south of Sanvordem is rich in Manganese deposits and the central portion has both manganese and Iron ore deposits of medium grade and relatively smaller in size.

Local Geological setting:

The entire area is more or less virgin, but for three old working pits. Towards the northern side of the lease area there is the Manganese pit while towards the South eastern is the Iron ore pit where the litho-units are exposed. Most of the area is covered with thick cap of laterite. Generally, the litho units as observed from the surface studies and the exploration data are the top capping of Laterite, followed by Iron ore, Manganese ore & Phyllitic clays.

The exposed rocks formation and the available borehole data, reveal that structurally ore body and associated formations appears to be subjected to syncline folding with dips towards NE & SW. The lease area being a hilly terrain consists of a major mineral band having a strike of NW-SE. The highest and lowest elevations in the lease area are 310m MSL and 150m MSL

respectively. No major structural disturbances have been observed within the lease area.

Type of Deposit: Bedded, Stratiform and Tabular deposit of regular habit
Strike / Trend of the Ore Body: N80°~85°W to S80°~85°E
Amount of dip of Ore body: 15° to 50°
Dip Direction of the Ore Body: NE and SW (Folded)
Depth: Depth varies from 10 to 42 meters
Type of ore: Lumpy at surface and tends to be powdery ore at depth.

The extent and variability of the mineralisation:

There is one band of Iron ore within the lease area having a strike length of about 1000m width of about 150m and an average depth of 30.8m. The Iron ore body is lumpy at surface and tends to be powdery ore. The exploratory drilling in this lease area reveals Iron ore body at a depth varying from 10m to 42m with lateritic lumpy Iron ore at a depth of 10 to 15m from the surface.
There are pockets of Manganese deposits towards the northern part of the lease area having a length of about 250m, width of about 100m and an average depth of 10m. The Manganese ore is lumpy in nature.

A discussion on the type of the deposit based on the style of mineralisation and minerals under investigation:

Iron Ore in Goa was formed from Banded Hematite Quartzite's and Ferruginous Phyllites through a specific process of leaching away silica, replacement by iron its concentration of iron. The process involves the circulating waters leaching away the Ca, Mg and Al in the initial stage followed by leaching of the silica in the later stage from banded hematite quartzite's resulting in the concentration of Iron ore.

Lateralization has played an important role in the concentration of manganese and Iron in the lease area, giving rise to rich accumulation of manganese and Iron ore.

The laterite is basically brownish pink to pinkish in colour, hard to medium in nature with concentration of Alumina. At places it is concentrated with Iron ore and also Manganese ore. Laterite analyses about 30-35% Fe with 15-20% Al_2O_3 and 20-25% SiO_2.

The Phyllites are pale pinkish and soft in nature with fine to medium grain size. They phyllites are having about 25-30% Fe with 18-22% Al_2O_3 and 15-20% SiO_2.

The Iron ore of this area is grayish blue in colour and is fine to medium grained size. The main mineral is haematite followed by limonite and goethite. The iron ore generally analyses about 55-60% Fe with 3.5-8% Al_2O_3 and 1.5-3.5% SiO_2.

Manganese ore is also seen as an associated mineral in the lease area. The manganese ore is purple to bluish in colour, is at places hard in nature and having fine to medium grain size. The Manganese ore is having more than 25% Mn with 5-8% Al_2O_3 and 10-12% SiO_2.

7. *Previous Exploration*

Name of Prospecting Agency: Shri. Naraina Sinai Quirtonim

Brief details of the exploration carried out are as follows:

Geological Mapping:	On a scale of 1 : 2000 over an area of 70.20 Ha.
Drilling:	14 non-core Boreholes with total meterage of 431m.
Exploratory Mining:	2 exploratory manganese pits having dimensions as follows: Pit 2 = 110m x 85m x 7m Pit 1 = 110m x 100m x 8m
Chemical Analysis:	The boreholes were sampled at a regular interval and analysed. Of the 14 boreholes about 68 samples were analysed.

Based on the above exploration, the Reserve & Resources for Iron ore and Manganese ore estimated in the last approved Scheme of Mining dated 05-12-2012 is as follows:

Category	UNFC Code	Iron Ore Quantity (Tonnes)	Manganese Ore Quantity (Tonnes)
Probable Ore	122	1214000	32000
Prefeasibility Mineral Resource	222	1422000	0
Inferred Mineral Resource	333	336000	0
TOTAL		**2972000**	**32000**

8. *Aerial or ground geophysical or geochemical data*

Aerial or ground geophysical: Nil

Geochemical data:

Exploration was carried out at grid of 100m x 100m grid spacing and about 14 Non-core boreholes were drilled with total meterage of 431m. Samples were analysed at regular intervals and about 68 samples have been analysed.

Additionally about 25 samples of lateritic lumpy ore, Manganese ore as well as waste have been collected and analyzed for confirmation of quality of the ore body.

9. ***Exploration undertaken during current investigation***

Name of Prospecting Agency: Shri. Naraina Sinai Quirtonim

Brief details of the exploration carried out are as follows:

Geological Mapping:	On a scale of 1 : 2000 over an area of 70.20 Ha.
Drilling:	Nil
Exploratory Mining:	Nil
Chemical Analysis:	About 25 samples of lateritic lumpy ore, Manganese ore as well as waste have been collected and analysed for confirmation of quality of the ore body
Bulk Density:	Bulk density study conducted on 9 samples as follows: Iron Ore : 3 Nos. of samples Lateritic Lumpy Ore : 3 Nos. of samples Waste : 3 Nos. of samples

10. Location of data point:

The Location ore non-core boreholes drilled is given below:

Sr No.	Borehole No.	Easting	Northing	Collar Level (Meters)	Inclination (Degrees)	Depth (Meters)
1	KR-01	400487.0313	1673200.959	270.25	90°	17
2	KR-02	400513.1269	1673176.186	262.34	90°	27
3	KR-04	400482.407	1673124.004	265.20	90°	30
4	KR-05	400453.7591	1673213.993	264.65	90°	31
5	KR-07	400522.8706	1673201.079	261.50	90°	32
6	KR-08	400537.6465	1673236.383	250.10	90°	26
7	KR-10	399839.0668	1673210.721	228.35	90°	35
8	KR-11	400035.8961	1673210.188	270.25	90°	35
9	KR-12	400354.8926	1673172.17	247.00	90°	37
10	KR-13	400566.5557	1673282.441	259.63	90°	30
11	KR-15	400529.5305	1673263.967	264.65	90°	30
12	KR-16	399945.044	1673214.14	268.32	90°	42
13	KR-17	399921.9701	1673351.806	304.00	90°	39
14	KR-18	400466.7361	1673177.09	270.11	90°	20

11. Sampling technique

About 25 samples of lateritic lumpy ore, Manganese ore as well as waste have been collected and analyzed for confirmation of quality of the ore body. Checks analysis of at least 10% of samples (2 samples of iron ore & one sample of manganese ore) has been analyzed from NABL accredited Laboratory.

12. *Drilling technique and drill sampling employed*

Exploration was carried out at grid of 100 by 100m spacing and about 14 Non-core boreholes were drilled with total meterage of 431m. Samples were analyzed at regular intervals and about 68 samples have been analyzed.

13. *Quality of assay data and laboratory tests*

The samples were analyzed for different radicals (Fe% Al_2O_3, SiO_2 & Mn) from laboratory by wet chemical analysis method and checks analysis of at least 10% of same samples have been analyzed from NABL accredited Laboratory. The Iron ore samples which are analyzed +45% Fe are considered in the estimation of Reserves and Resources and +10% Mn is considered for the estimation of Manganese ore.

14. *Bulk Density*

The bulk density study for Iron ore, Lateritic Lumpy Iron Ore and Waste from the mine have been determined. The Bulk density for Manganese ore has been assumed based on the earlier approved Scheme of Mining dated 05-12-2012. Details of the Bulk density are given as follows:

Sl. No.	Nature of Ore/OB	Mineral	Number of samples	Bulk Density Established t/m³
1	Iron Ore	Iron Ore	3	2.8
2	Lateritic Lumpy Iron Ore	Iron Ore	3	2.5
3	Waste	Clays	3	2.0
4	Manganese Ore	Manganese Ore	Nil	2.6

15. ***Beneficiation studies as may be required:***

Nil

16. ***Resource estimation techniques***

The Reserves and Resources are estimated based on the Minerals (Evidence of Mineral Contents) Rules 2015 and as per the UNFC classification guidelines the ore body is classified under Bedded, Stratiform and Tabular deposit of regular habit.

Reserves and Resources are estimated by cross sectional method. Cross sections are drawn at regular interval of 50m and the geological structures are projected based on the boreholes drilled and geological surface exposures. Sectional areas are calculated for each section. These sectional areas are used to calculate section-wise tonnages. Tonnages of the Reserves/ Resources are estimated as a product of sectional areas, sectional influence, bulk density and recovery factor as follows:

Tonnage = Sectional area (m^2) x Section influence (m) x Bulk density (tonnes/m^3) x Recovery%

The Bulk density for Iron ore, Lateritic Lumpy Iron Ore & waste and recovery of Iron ore have been determined from laboratory and reports of the same are enclosed as Annexure no. 12. The Bulk density for Manganese ore has been assumed based on the earlier approved Scheme of Mining dated 05-12-2012.

17. Reporting of resources

Reserves/Resources as estimated on 01-01-2022

Classification	Code	Iron Ore		Manganese	
		Quantity (Million Tonnes)	Grade	Quantity (Million Tonnes)	Grade
A. Mineral Reserve					
1. Proved Mineral Reserve A	111	0.940	+45% Fe	0	-
2. Probable Mineral Reserve A	121	0	-	0	-
3. Probable Mineral Reserve A	122	2.261	+45% Fe	0	-
B. Remaining Resources					
1. Feasibility Mineral Resource B	211	0	-	0	-
2. Prefeasibility Mineral Resource B	221	0	-	0	-
3. Prefeasibility Mineral Resource B	222	0.274	+45% Fe	0	-
4. Measured Mineral Resource B	331	0	-	0	-
5. Indicated Mineral Resource B	332	0.081	+45% Fe	0	-
6. Inferred Mineral Resource B	333	0.780	+45% Fe	0.032	+25% Fe
7. Reconnaissance Mineral Resource B	334	0	-	0	-
Total Mineral Resources A+B		**4.336**	**+45% Fe**	**0.032**	**+25% Fe**

18. Summary and recommendations :

Based on the present Reserves and Resources of Iron Ore and considering the production of 0.5 million tonnes per annum, the deposit is economically viable.

HDFC BANK
We understand your world

HDFC BANK LTD
Ranghavi,
Opp. Municipality Garden,
Dr. George Baretto Road,
Margao, Goa - 403 601.

Date_____
Form Serial No. GTEE/ 488204

To,

THE REGIONAL CONTROLLER
OF MINES MARGAO GOA

OUR BG NO. : 059GT01220350001
DATE OF ISSUE : 04-FEB-2022
APPLICANT : NARAINA S QUIRTONIM MINES
GUARANTEE AMOUNT : INR1,41,50,000.00
AMOUNT IN WORDS : RUPEES ONE CRORE FORTY ONE LAKH FIFTY THOUSAND ONLY

EXPIRY DATE : 31-MAR-2027
EXPIRY PLACE : GOA
CLAIM DATE : 30-MAR-2028

DEAR SIR,

PLEASE FIND ENCLOSED THE CAPTIONED GUARANTEE DULY ISSUED BY US. THE ORIGINAL GUARANTEE ATTACHED IS TO BE RETURNED TO US ALONG WITH BENEFICIARY DISCHARGE LETTER WITHIN 15 DAYS FROM THE DATE IT CEASES TO BE IN FORCE OR AS SOON AS THE PURPOSE FOR WHICH IT HAS BEEN ISSUED IS FULFILLED ,WHICHEVER IS EARLIER.

WE CONFIRM THAT THE SIGNATORIES WHO HAVE SIGNED THE SUBJECT GUARANTEE / EXTENSION AS STATED BELOW HAVE THE REQUISITE POWERS TO SIGN ON BEHALF OF THE BANK.

1. Mr./Ms. Vaibhav Naik
Designation BM
PA / Auth Sig. No V1883

2. Mr./Ms. Swati Kamat
Designation BOM
PA / Auth Sig. No S8551

FURTHER CONFIRMATION OF THIS GUARANTEE IF DESIRED, SHOULD BE OBTAINED FROM THE ABOVE MENTIONED BRANCH.
THIS LETTER FORMS AN INTEGRAL PART OF THE GUARANTEE.

FOR HDFC BANK LTD.

AUTHORISED SIGNATORY/S
Ravindra Naik
Emp. Code R0284

HDFC BANK LTD. Margao-Goa

गोवा GOA

Serial No. 10302 Place of Vendor MARGAO Date: 2/12/2022

610293

Value of Stamp Paper: 1000/-

Name of Purchaser: Pradnya Pai Cano

Residance: ..... Name of Father: .....

Purpose: ..... Transacting Parties } .....

As there is no one single paper for the value of Rs. 1000/- Additional stamp papers for the completion of the value are attached along with.

Stamp Vendor's Sign.
MRS. SAI GITA S. KOLWALKAR
Lic No. JUD/VEN-LIC/1/2016/AC-1
Margao-Goa

Signature of Purchaser

This stamp paper forms an integral part of Bank Guarantee No. 059GT0122035O001 dated 04-FEB-2022 for Rs. 1,41,50,000/- (Rupees One Crore Forty One Lakh Fifty Thousand Only) in favour of the "REGIONAL CONTROLLER OF MINES, MARGAO GOA."

NAME VAIBHAV MOYE
DESIGNATION BRANCH MANAGER
EMPLOYEE-CODE V1883

Swati Kamath
Emp. Code S8551

IDFC BANK LTD. Margao-Goa

BG NO:059GT01220350001

DTD:04-FEB-2022

The Regional Controller of Mines,
Indian Bureau of Mines,
Margao – Goa.

This Deed of guarantee executed 04-FEB-2022 by Hdcf bank ltd constituted under the Act having its central office at Senapati bapat marg lower parel mumbai 400013 and amongst other places, a branch at Goa (hereinafter referred to as the Bank) in favour of the Regional Controller of Mines, Indian Bureau of Mines, Margao – Goa (hereinafter referred to as the Beneficiary) for an amount not exceeding Rs. 1,41,50,000/- (Rupees One Crore Forty One Lakhs Fifty Thousand only) at the request of Smt. Pradnya Zoivant Pai Cano, for self and on behalf of all other Heirs of Late. Shri Naraina Sinai Quirtonim as their duly Constituted Attorney (hereinafter referred to as the Contractor/s).

This guarantee is issued subject to the condition that the liability of the bank under this guarantee is limited to maximum of Rs. 1,41,50,000/- (Rupees One Crore Forty One Lakhs Fifty Thousand only) and the guarantee shall remain in full force up to 31-03-2027 and cannot be revoked on or before 31-03-2027 (last date of claim) by the Bank or applicant.

BANK GUARANTEE AND CO-ACCEPTANCE BOND

1. Agreement on production of a Bank guarantee for Rs. 1,41,50,000/- (Rupees One Crore Forty One Lakhs Fifty Thousand only) under rule 27 of Mineral Conservation and Development Rules, 2017 (MCDR 2017) as amended by Ministry of Mines vide notification dated 03-11-2021.

2. We, Hdfc bank ltd Branch, Goa, at the request of Smt. Pradnya Zoivant Pai Cano, for self and on behalf of all other Heirs of Late. Shri Naraina Sinai Quirtonim as their duly Constituted Attorney do hereby undertake to pay to the Regional Controller of Mines, Indian Bureau of Mines Margao – Goa or any other officer authority nominated by the Controller General, Indian Bureau of Mines an amount not exceeding Rs. 1,41,50,000/- (Rupees One Crore Forty One Lakhs Fifty Thousand only) against any loss or damage caused to or suffered or would be caused to or suffered by the Government or towards non-compliance of provisions of Rule 22, 23 and 26 of MCDR, 2017 i.e. Mine closure plan/progressive mine closure plan approved in respect of the mining lease of Zamblidadga Dongor Iron and Manganese Ore Mine bearing M.L. No. 3/Fe-Mn/79 over an area of 70.20 Hects. in survey number 19/0 (part), granted by State Government to Late. Shri Naraina Sinai Quirtonim situated in Caurem Village, Quepem Taluka, South Goa District, Goa State by

NAME VAIBHAV MOYE
DESIGNATION BRANCH MANAGER
EMPLOYEE CODE V1883

Swati Karaokh
Emp. Code S855f

HDFC BANK LTD. Margao-Goa

reason of any breach of the said lessee of any of the terms or conditions contained in the Mine closure plan/progressive mine closure plan.

3. We, Hdfc bank ltd Branch, Goa, do hereby undertake to pay the amount due and payable under this guarantee without any demur, to the authority merely on a demand from the Regional Controller of Mines, Indian Bureau of Mines Margao – Goa or any other authorized by the Controller General, Indian Bureau of Mines stating that the amount claimed is due by way of loss or loss of damage caused to or would be caused to or suffered by the government by reason of breach by the said lessee or any of the terms or conditions contained in the mining plan/mining scheme or by reason of lessee's failure to perform the said mine closure plan/progressive mine closure plan. However our liability under this guarantee shall be restricted to an amount not exceeding Rs. 1,41,50,000/- (Rupees One Crore Forty One Lakhs Fifty Thousand only).

4. We undertake to pay to the authority on a demand from the Regional Controller of Mines, Indian Bureau of Mines, Margao – Goa or any other officer authorized by the Controller General, Indian Bureau of Mines or Govt. of India any money so demanded notwithstanding any dispute or disputes raised by the lessee in any suit or proceedings pending before any court or tribunal relating thereto our liability under this present being absolute and unequivocal. The payment so made by us under this bond shall be valid discharge of our liability for payment there under and lessee shall have no claim against us for making such payment.

5. We, Hdfc bank ltd Branch, Goa, further agree that the guarantee herein contained shall remain in full force and effect during the period up to the end of the Mining plan/Review of Mining Plan period of five years that would be taken for performance of the said Agreement and that shall continue to be enforceable till all the dues of the Govt. under or by virtue of the said agreement have been fully paid and its claims satisfied or discharged till Regional Controller of Mines, Indian Bureau of Mines, Margao – Goa or any other officer authorized by the Controller General, Indian Bureau of Mines certifies that the terms and conditions of the said progressive mine closure plan/final mine closure plan have been fully and properly carried out by the said lessee and accordingly discharge this guarantee. Unless a demand or claim under this guarantee is made on us in writing on or before 30-MAR-2028 , we shall be discharged from all liability under this guarantee thereafter.

HDFC BANK LTD. MARGAO-GOA

NAME VAIBHAV MOYE
DESIGNATION BRANCH MANAGER
EMPLOYEE CODE V1883

Swati Kamat
Emp. Code S865

6. We further agree that Regional Controller of Mines, Indian Bureau of Mines, Margao – Goa or any other officer authorized by the Controller General, Indian Bureau of Mines shall have fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said agreement or to extend time of performance by the said lessee from time to time or to postpone for any time or from time to time any powers exercisable by Regional Controller of Mines, Margao - Goa against the said lessee and to forbear or enforce any of the terms and conditions relating to the said agreement, we Hdfc bank ltd Branch, Goa, shall not be relieved from our liability by reason of any such variation or extension being granted to the said lessee or for any forbearance, act or omission on the part of Regional Controller of Mines, Indian Bureau of Mines, Margao – Goa or any indulgence by Regional Controller of Mines, Indian Bureau of Mines, Margao – Goa to the said lessee or any manner or thing whatsoever which under the law relating to sureties, would but this provision have effect of so relieving us.

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

8. We, Hdfc bank ltd Branch, Goa, lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Regional Controller of Mines, Indian Bureau of Mines, Margao – Goa in writing.

9. Notwithstanding anything contained herein :

   a)Our liability under this Bank guarantee shall not exceed Rs. 1,41,50,000/- (Rupees One Crore Forty One Lakhs Fifty Thousand only).

   b) The bank guarantee shall be valid up to 31-03-2027.

   c)The period of bank guarantee submitted is valid for the period of the proposals given in the mining plan/Scheme of mining/PMCP etc. We are liable to pay the guarantee amount or any part thereof under this Bank guarantee and only if served upon us a written claim or demand on or before 31-03-2028.

   All claims under the guarantee will be payable at HDFC BANK LTD Goa

   This guarantee will be returned to us as soon as the purpose for which it is issued is fulfilled.

   The BG Confirmation Letter No. GTEE/4882.04is an integral part of the Bank Guarantee no.059GT01220350001 Dated: 04-FEB-2022

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

11. In witness whereof, the bank through its authorized officer has set its hand and stamp on this ___ Day of 04 - FEB - 2022 at MARGAO .

NAME VAIBHAV MOYE
DESIGNATION BRANCH MANAGER
EMPLOYEE CODE V1883

Swati Kanekh
Emp. Code S6551

HDFC BANK LTD. Margao-Goa

ANNEXURE No. 18

13/7/98 26 V t/ 1396
21/7/98
100/35 55/-

21/7/98

- Notarial Deed of Declaration for Succession Of Heirs -

On this thirteenth day of the month of July in the year nineteen hundred ninety eight, in this judicial Division of Salcete, city of Margao and in the notarial office functioning on the ground floor of Margao Municipal Council building situated at Dr. Jorge Barreto square and before me Pandurang S.S. Bareo, Notary Public Ex-officio of the same judicial division and before the fit witnesses known to me and who shall sign at the end, there app-

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and as "Declarants" Shri Francisco Xavier Almeida, married, service, residing at Margao, Shri. Vasudev G. Padiya, married, service, residing at Cuncolim and Shmt. Lata V.P. Navelkar, married, service, residing at Navelim, hereand as 'Interested Party' Kum. Pradnya Naraina Kirtany, spinster, aged nineteen years, residing at Comba Margao, Goa. I do hereby certify the identity of the said declarants as I know them personally and of the Interested party by her own declarations and all of them being also known to the witnesses. And in the presence of the said witnesses the said declarants to whom I admit to this act as trustworthy persons, well behaved, of good conduct and without any legal impediment to this act stated before me clearly as follows: That Shri. Narayan Kirtani alias Naraina Mukunda Sinai quinanim alias Naraina Sinai Kirtany, who hailed from Aquem Margao and died on twenty second April, nineteen hundred ninety eight, at H.M.C, intestate and without executing any other disposition of his last wish, but, leaving behind his widow the said Manjulabai Jaba Sinai Sacardando alias Kala Naraina Kirtany alias Kala Naraina Kirtani alias Kala Naraina Sinai

Kirtani, as his 'moiety - sharer' and his Two daughters namely (i) Kum. Priya: Narsina Kirtany, spinster, aged twenty three years and (ii) Kum. Pradnya Narsina Kirtany, aged nineteen years, the above Interested Party, as his 'Sole and universal heirs'. That the said declarants are perfectly aware of all the facts stated by them above as they are in close contact and in good harmony with the family of the said deceased persons, are not relatives who could succeed the said deceased person nor do they have any interest or intention in the present deed than to testify the truth and therefore, they affirm, confirm and declare for all purposes and intents that the said Smt. Kala Narsina Kirtany is the moiety sharer, and the said Two daughter Priya and Pradnya, are the 'Sole and universal heirs', of their deceased father said Narayan Kirtani, there being no other person or heir like, in terms of Laws of Succession still in force in this state of Goa may prefer the said qualified heirs and moiety sharer - in the succession of the said deceased & could concur with them to the estate and inheritance left by the said deceased. The said Interested Party then stated before me

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that the declarations made above by the said declarants are absolutely true and correct and as such he accepts the same for all purposes and intents adding further that in the estate and inheritance left by his deceased father there exist no moveable assets to be described in this deed but exist only immoveable properties. were handed over to me five certificates being one death of the deceased person, two birth certificates of heirs, one marriage and one delivergrey certificates, which I file in this office in the bunch of documents pertaining to this book and shall be transcribed in the copies of this deed. Thus they stated and granted which I hereby attest. the witnesses present whose fitness I verified were [illegible] who are going to sign alongwith the declarants, Interested party and with me the Notary Ex-officio, after having been read aloud by me in the simultaneous presence of all and by all found it proper. this deed bears notarial stamp of rupees seven only.

Bill No : 100/35
Deed - 20.00
Succession - 25.00
C-folio - 13.00
Exhibit - 2.00
60.00

Rupees sixty only.

13/11/92

The Notary Ex-officio

13/11/92

1396/06V

458479

GOVERNMENT OF GOA

DIRECTORATE OF PLANNING, STATISTICS AND EVALUATION

FORM No. 9

(See Rule 9)

CERTIFICATE OF BIRTH ~~issued under section 17 of the~~ issued under section 17 of the Registration of Births and Deaths Act, 1969.

This is to certify that the following information has been taken from the original record of birth which is in the register for South Goa Taluka Salcete of District in the State of Goa.

Name Pradnya Narsina Kirtany

Sex Female Registration No. 3039

Date of Birth 24th October 1978 (Twenty eight) Date of Registration 2.11.1978

Place of Birth Casa de Saude Margao

Permanent address of father and mother Couba Madgao

Name of father Narsina Dinai Kirtany

Name of mother Kala Narsina Kirtany

Nationality of father Indian

Nationality of mother Indian

Name of grandfather (father's side)

Name of grandmother (father's side)

Signature of Issuing Authority

Seal

Date 17/6/98

Chief Registrar
(Facsimile signature)

Govt. Printing Press, Panaji-Goa—325/2,000—6/1997

54

1396/96

458474

GOVERNMENT OF GOA

DIRECTORATE OF PLANNING, STATISTICS AND EVALUATION

FORM No. 9

(See Rule 9)

CERTIFICATE OF BIRTH ~~Issued under section 12 of the~~ issued under section 17 of Registration of Births and Deaths Act, 1969.

This is to certify that the following information has been taken from the original record of birth which is in the register for Margao Taluka Salcete of District South Goa of the State of Goa.

Name Priya Naraina Kirtany

Sex Female Registration No. 1788

Date of Birth 21st June 1975 (Seventy five) Date of Registration 10.7.1975

Place of Birth Casa de Saude Margao

Permanent address of father and mother Comba, Margao

Name of father Naraina Sinai Kirtany

Name of mother Kala Naraina Kirtany

Nationality of father Indian

Nationality of mother Indian

Name of grandfather (father's side) ——

Name of grandmother (father's side) ——

Signature of Issuing Authority

Date 17/6/98

Seal

Chief Registrar

(Facsimile signature)

71764

Photo. Press Panaji-Goa — 325/2,000 — 6/1997

55

1396
26V

Certificate of Marriage No. 2777

Receipt No. 23/11 ...

Civil Registration Services of Goa

Herculano Valente Almeida, civil
¹(Name and designation of the issuing authority)
Registrar Cum Sub-Registrar Ilhas

I do hereby certify that on page No.* 79 V against entry No.* 213/67 of the Marriage (extract) Registration Book for the year nineteen hundred Sixty Seven is registered the marriage of Narayna Mucunda Sinai Quirtonim

native from ——— residing at Margao
legitimate son of Mucunda Sinai Quirtonim (deceased) ———
and of Sorospoti Edgo by other name Mutinabai Quirtonim
to Manjulabai Baba Sinai Sacordando native from ———

Searched by:

Conferred by:

(P.T.O.)

and residing at Panajim legitimate daughter of Baba Esvonta Sinai Sacordande (deceased) and of Anjinibai Sinai Sacordande

solemnized on nineteenth of May

of year nineteen hundred and Sixty seven

in the Civil Registration Office, Goa

Paid fee of Rupees five only

Civil Registration Office Ilhas, Panaji

25 June 98 of the year

nineteen hundred and ninety eight

* In numerals

The Civil Registrar, Ilhas

Govt. Ptg. Press, Panaji-Goa — 1481/25,000 — 4/1995.

1396 / 26V Regn 1608

Government of Goa

DIRECTORATE OF PLANNING, STATISTICS AND EVALUATION.

FORM No. 10

(See Rule 9)

CERTIFICATE OF DEATH *

~~Issued under section 12~~ of the Registration of Births and Deaths issued under section 17 Act 1969.

This is to certify that the following information has been taken from the original record of death which is in the register for ......G.M.C...... of (local area)

Taluka ....Tiswadi.... of District ....N. Goa.... of State of Goa.

Name ....Narayan Kistani....

Nationality ....Indian.... Permanent address ....Agassim Margao Goa....

Sex ....Male....

Date of Death ....27/4/1998.... Registration No. ....562....

Place of Death ....G.M.C.... Date of Registration ....27/4/98....

Name of Father ....Mukund Kistani....

Name of Mother ....

Name of Husband ....

Signature of issuing authority

[signature]

SUB - REGISTRAR

BIRTHS AND DEATHS

GOA MEDICAL COLLEGE COMPLEX

BAMBOLIM - GOA.

Chief Registrar

Facsimile Signature

[signature]

Date 13/7/1998

Note: In the case of death, no disclosure shall be made of particulars regarding the cause of death as entered in the Register. See proviso to Sub-section 17(1)

Govt. Ptg. Press, Panaji-Goa -1547/50000-2/97

B90
26V

No. MAM/SAL/DIVER-CERT/1998./3200
Office of the Mamlatdar of Salcete,
Margao-Goa.

Dated: 18/6/1998.

Read:

Application from Smt. Kala Naraina Kirtani, dated: 11/6/98.

Affidavit sworn by the applicant dated: 11/6/98, executed before notary public Shri A& V. PrabhuDessai, Margao.

Documentry evidence, Affidavit, Copy of Driving Licence Copy of ration card, Copy of Marriage Certificate Report from the Talathi of Margao dated: 16/6/98.

DIVERGENCY CERTIFICATE

This is to certify that Smt. Kala Naraina Kirtani resident of Aquem Alto Margao is also Known as Kala Naraina Sinai Kirtani and Manjulabai Jaba Sinai Sacardando. All these names Kala Naraina Kirtani, Kala Naraina Sinai Kirtani and Manjulabai Jaba Sinai Sacardando are of one and the same person

This certificate is issued at the request of the applicant to produce the same before Competent Authority.

MAMLATDAR OF SALCETE
MARGAO-GOA

A. V. Figueiredo
Mamlatdar of Salcete, Taluka
Margao-Goa.

Certificate of Marriage No. 5068/05

Receipt No. 33/1789

Civil Registration Services of Goa

Chandrakant Pissurlekar

(Name and designation of the issuing authority)

Civil Registrar, Salcete

Searched by :

I do hereby certify that on page No. — against entry No. 1524/98 of the Marriage Registration book for the year nineteen hundred and ninety eight is registered the marriage of Prasad Premanand Navelkar

native from Margao residing at Colmorod, Margao

legitimate son of Premanand Ganesh Navelkar

and of Manik Premanand Navelkar

Conferred by :

to Priya Prasad Navelkar formerly Priya Narayan Kirtany

native from Margao

(P. T. O.)

and residing at Margao legitimate daughter of Late Narsinga Sinai Kirtany and of Late Narsing Kirtany solemnized on Twentyeighth of December of the year nineteen hundred and ninety eight in the Civil Registrar's office, Salcete

Paid fee of Rupees Ten only

Civil Registration Office of Salcete, sixth of october of the year two thousand and four

The Civil Registrar

In numerals

Govt. Ptg. Press, Panaji-Goa — [illegible],000 — 9/2004

Certificate Of Marriage No.: - 20783/18
Receipt No.: 49/381

Civil Registration Services of Goa

Shri. Domingos Martins

Civil Registrar, Salcete at Margao - Goa

(Name and designation of the issuing authority)

I do hereby certify that on page No. 112 against entry No. **1616/2001**

searched by:

of the Marriage (7) Registration book for the year Two Thousand and One is registered the marriage of **Zoivont Malu Poi Cano** native from Navelim and residing at Colmorod, Navelim legitimate son of Malu Poi Cano and of Duarcabai Poi Cano

conferred by:

to **Pradnya Naraina Kirtany ; Changed to Pradnya Alias Saraswati Zoivont Poi Cano** native from Margao and residing at Aquem legitimate daughter of Late Naraina Sinai Kirtany and of Kala Naraina Kirtany

solemnized on **15 th of October of the year Two Thousand and One** in the Civil Registration Office of Salcete

Paid fee of Rupees Fifty Only

Civil Registration Office at Salcete at Margao - Goa , dated 3 rd of September of the year Two Thousand and Eighteen

THE SEAL OF THE CIVIL REGISTRAR OF SALCETE * MARGAO - GOA *

Shri. Domingos Martins
Civil Registrar, Salcete at Margao - Goa

DIRECTORATE OF INDUSTRIES & MINES
MINES WING

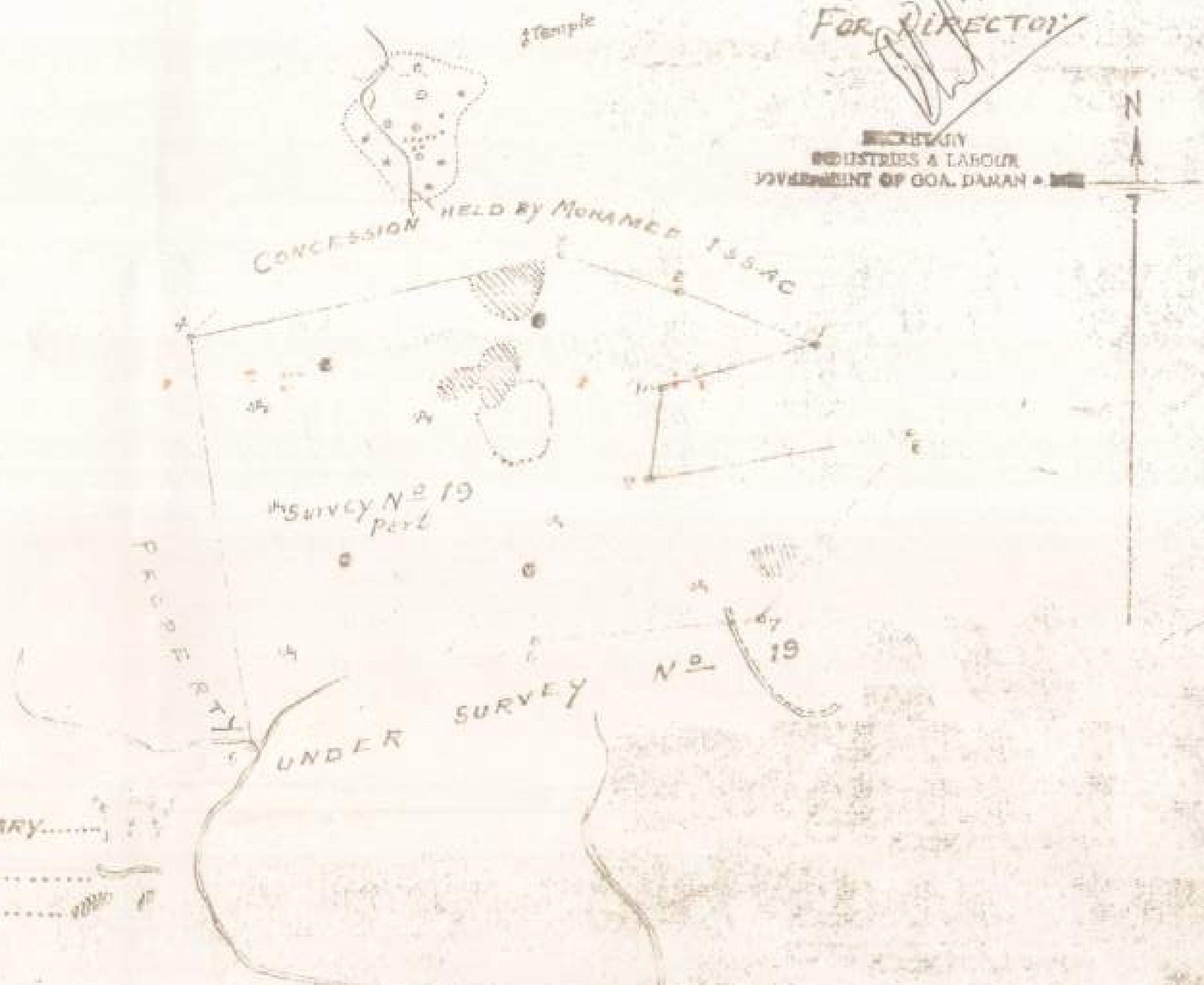
COPY

OF THE PLAN OF THE MINING LEASE SITUATED AT CAUREM VILLAGE OF QUEPEM TALUKA, GRANTED TO SHRI NARAINA SINAI QUIRTONIM, FROM MARGAO FOR EXTRACTION OF Fe & Mn ORE

AREA ..... 70·2800 Ha
Scale 1:10000

(S. V. Kamat)
S.T.A
For Director

SECRETARY
INDUSTRIES & LABOUR
GOVERNMENT OF GOA, DAMAN & DIU



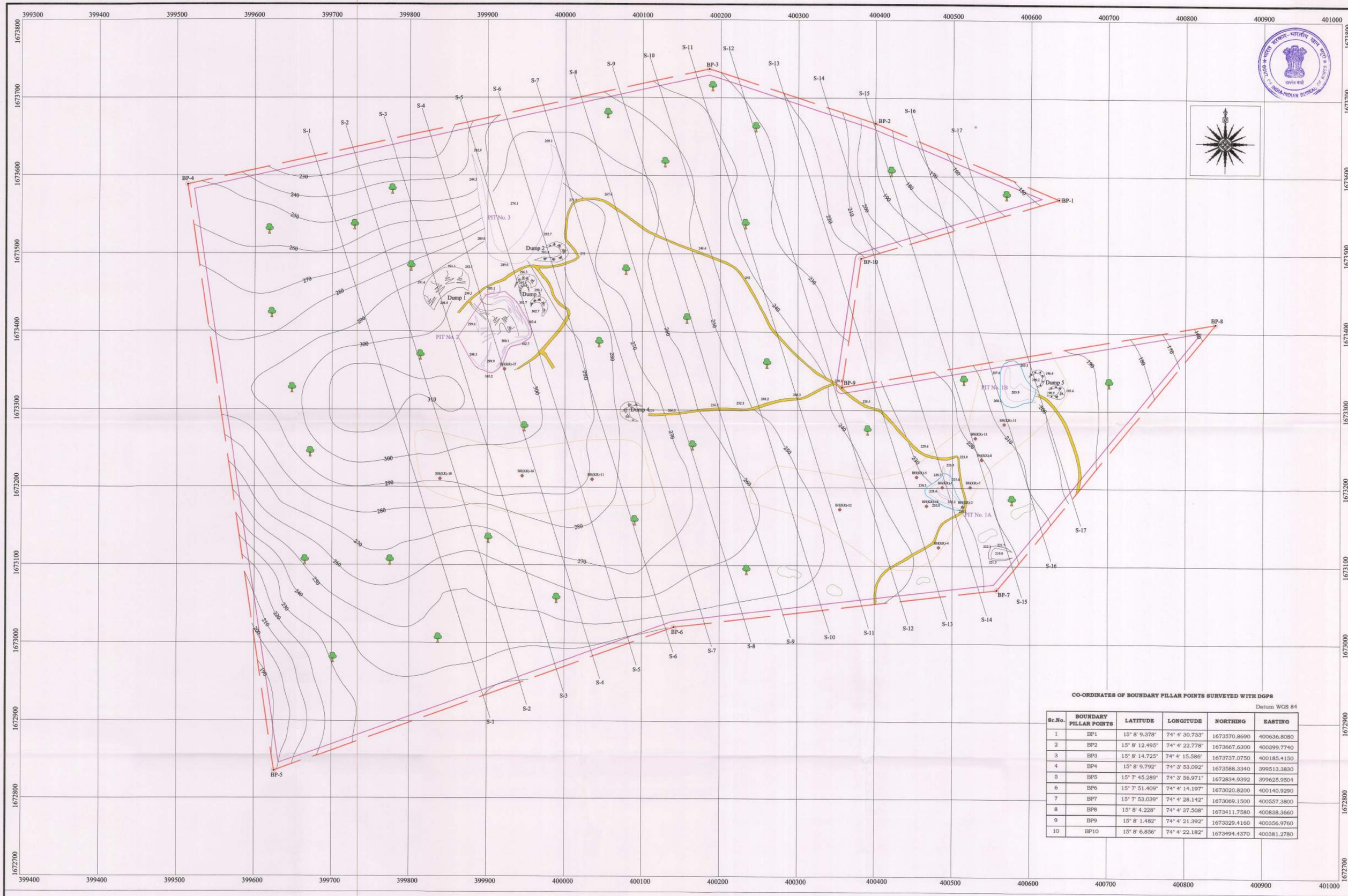
LEGEND

MINING LEASE BOUNDARY ....
NALLA ....
PIT ....

Checked by

1-12-79

PLATE No.1



CO-ORDINATES OF BOUNDARY PILLAR POINTS SURVEYED WITH DGPS

Datum WGS 84

Sr.No.	BOUNDARY PILLAR POINTS	LATITUDE	LONGITUDE	NORTHING	EASTING
1	BP1	15° 8' 9.378"	74° 4' 30.733"	1673570.8690	400636.8080
2	BP2	15° 8' 12.495"	74° 4' 22.778"	1673667.6300	400399.7740
3	BP3	15° 8' 14.725"	74° 4' 15.586"	1673737.0750	400185.4150
4	BP4	15° 8' 9.792"	74° 3' 53.092"	1673588.3340	399513.3830
5	BP5	15° 7' 45.289"	74° 3' 56.971"	1672834.9392	399625.9504
6	BP6	15° 7' 51.409"	74° 4' 14.197"	1673020.8200	400140.9290
7	BP7	15° 7' 53.039"	74° 4' 28.142"	1673069.1500	400557.3800
8	BP8	15° 8' 4.228"	74° 4' 37.508"	1673411.7580	400838.3660
9	BP9	15° 8' 1.482"	74° 4' 21.392"	1673329.4160	400356.9760
10	BP10	15° 8' 6.856"	74° 4' 22.182"	1673494.4370	400381.2780

INDEX

- LEASE BOUNDARY
- CONTOUR (270)
- KACCHA ROAD
- OLD WORKING PIT
- WASTE DUMP
- BOREHOLE (BH(KR)-9)
- 7.5m STATUTORY BARRIER
- VEGETATION
- SOIL COVER
- LATERITIC LUMPY IRON ORE (+45% Fe) OUTCROP
- IRON ORE (+45% Fe) OUTCROP
- Mn Ore OUTCROP

SCALE - 1 : 2000

20 0 20 40 60 80 100 200 300 400 500

Certified that the Plan is prepared based on the lease map authenticated by the State Government and is correct to the best of my knowledge

Roshel Fernandes
Qualified Person

ZAMBLIDADGA DONGOR IRON AND MANGANESE ORE MINE

LESSEE: LATE SHRI NARAINA SINAI QUIRTONIM

M.L. NO. 03/FeMn/79, AREA:70.20 Ha

VILLAGE CAVOREM (CAUREM), TALUKA QUEPEM, DISTRICT: SOUTH GOA

PURPOSE OF THE PLAN: SURFACE PLAN

PLAN No.	DATE	SCALE
DWG-1	01-01-2022	1 : 2000

CERTIFICATE

CERTIFIED THAT THE PLAN IS CORRECT

Mining Engineer

Surveyor

PLATE No.2

INDEX

- LEASE BOUNDARY
- CONTOUR
- KACCHA ROAD
- OLD WORKING PIT
- WASTE DUMP
- BOREHOLE
- 7.5m STATUTORY BARRIER

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- LATERITE WITH MURRUM
- LATERITIC LUMPY IRON ORE (+45% Fe)
- IRON ORE (+45% Fe)
- MN ORE
- SAMPLING LOCATION
- G1 LEVEL OF EXPLORATION
- G2 LEVEL OF EXPLORATION
- G3 LEVEL OF EXPLORATION
- NON MINERALISED AREA
- STRIKE & DIP
- PROPOSED BOREHOLES
- PROPOSED NON CORE BOREHOLES
- PROPOSED TRENCHES
- ULTIMATE PIT LIMIT

SCALE - 1 : 2000

20 0 20 40 60 80 100 200 300 400 500

ZAMBLIDADGA DONGOR IRON AND MANGANESE ORE MINE

LESSEE: LATE SHRI NARAINA SINAI QUIRTONIM

M.L. NO. 03/Fe-Mn/79, AREA:70.20 Ha

VILLAGE CAVOREM (CAUREM), TALUKA QUEPEM, DISTRICT: SOUTH GOA

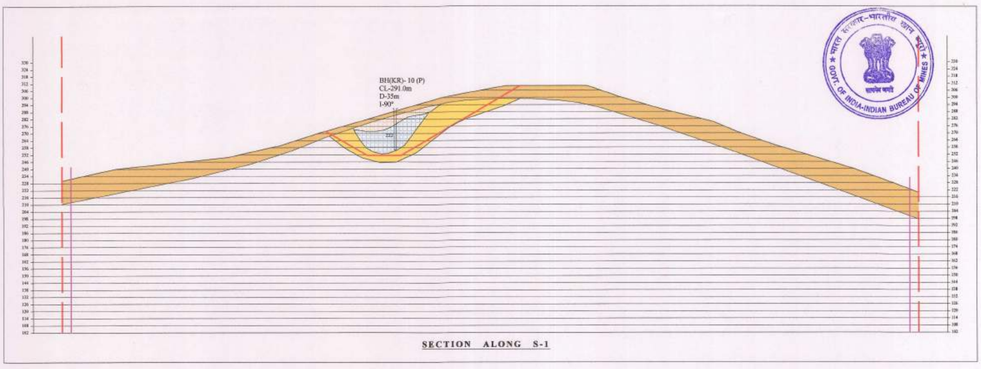
PURPOSE OF THE PLAN: SURFACE GEOLOGICAL PLAN

PLAN No.	DATE	SCALE
DWG-2	01-01-2022	1 : 2000

Certified that the Plan is prepared based on the lease map authenticated by the State Government and is correct to the best of my knowledge

(Roshel Fernandes)
Qualified Person

PLATE No.3



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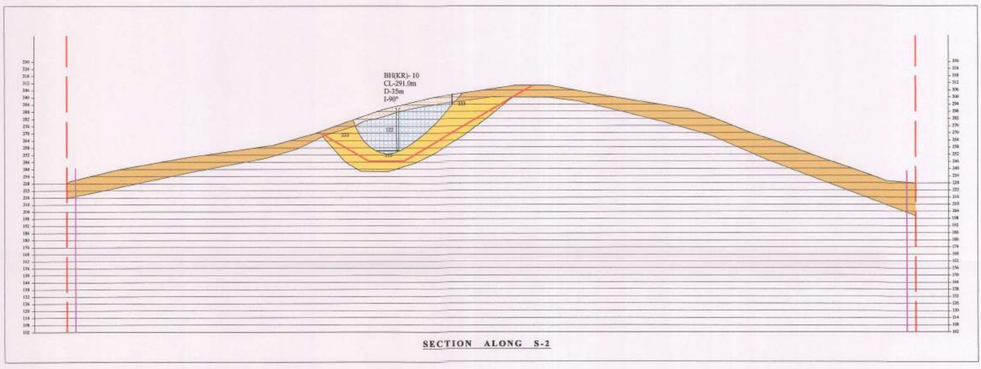

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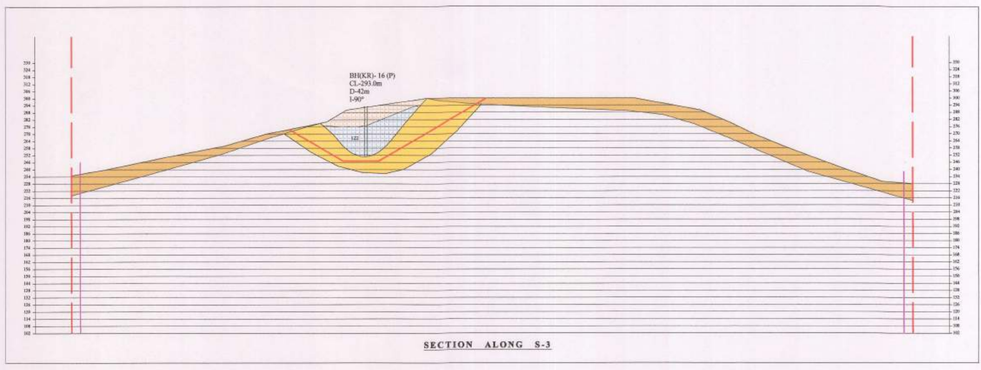

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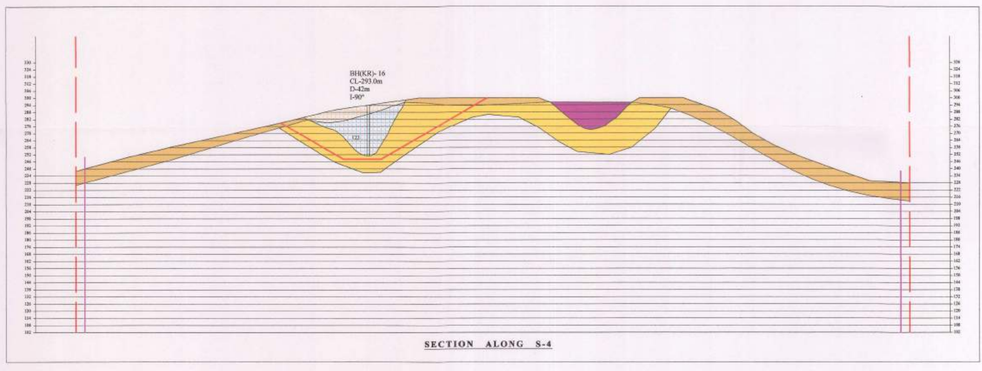

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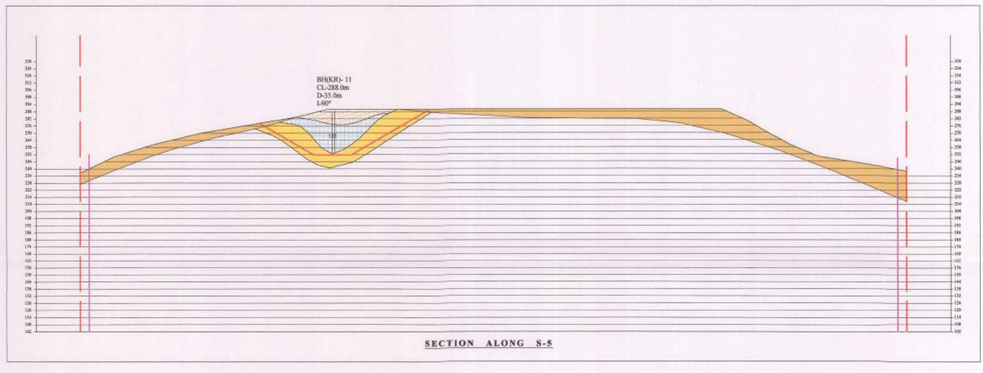

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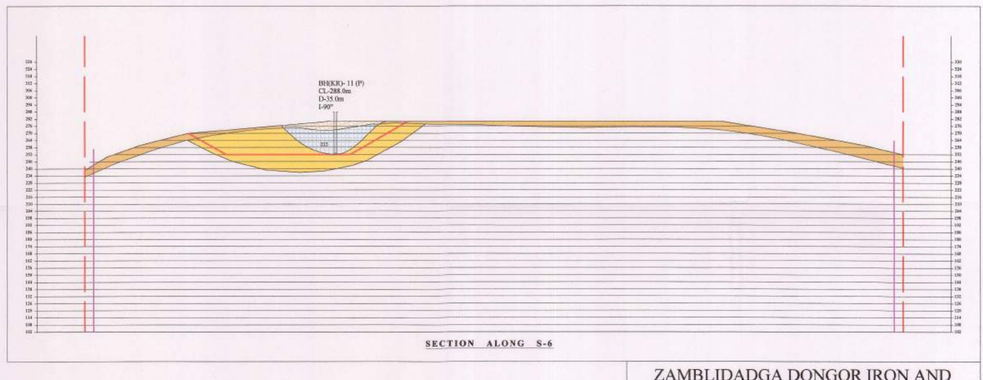


SECTION ALONG S-6

INDEX

- LATERITE
- LATERITIC LUMPY IRON ORE (+45% Fe)
- IRON ORE (+45% Fe)
- CLAYS (FERRUGINOUS/MANGANIFERROUS/PHYLLITIC)
- MN ORE
- LEASE BOUNDARY
- ULTIMATE PIT LIMIT
- 7.5 MTRS STATUTORY BARRIER

EXISTING BOREHOLES

BH(KR)-1 (BOREHOLE NUMBER)
CL (COLLAR LEVEL) = 228.5m
D (DEPTH) = 17.0m
I (INCLINATION) = 90°

ZAMBLIDADGA DONGOR IRON AND MANGANESE ORE MINE

LESSEE: LATE SHRI NARAINA SINAI QUIRTONIM

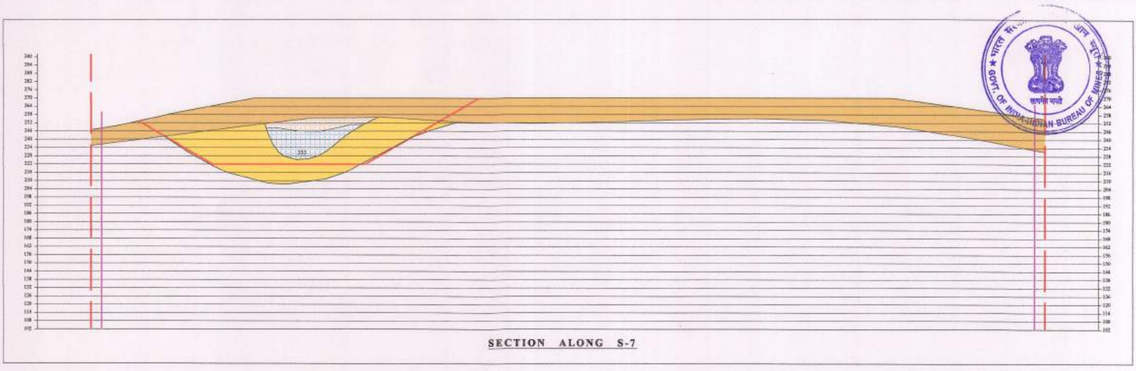
M.L. NO. 03/FeMn/79, AREA:70.20 Ha

VILLAGE CAVOREM (CAUREM), TALUKA QUEPEM, DISTRICT: SOUTH GOA

PURPOSE OF THE SECTION : - GEOLOGICAL CROSS SECTION

DATE	SCALE	
01 - 01 - 2022	1 : 2000	Certified that the Section is prepared based on the lease map authenticated by the State Government and is correct to the best of our knowledge Rushel Fernandes Qualified Person

PLATE No.4



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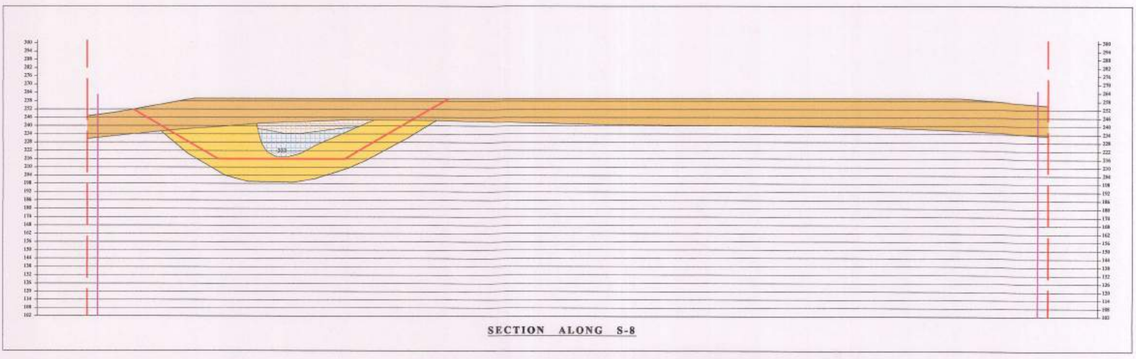

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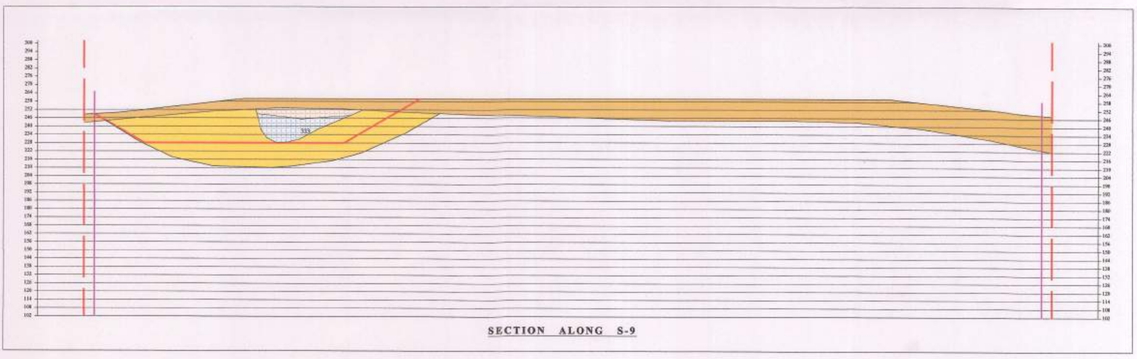
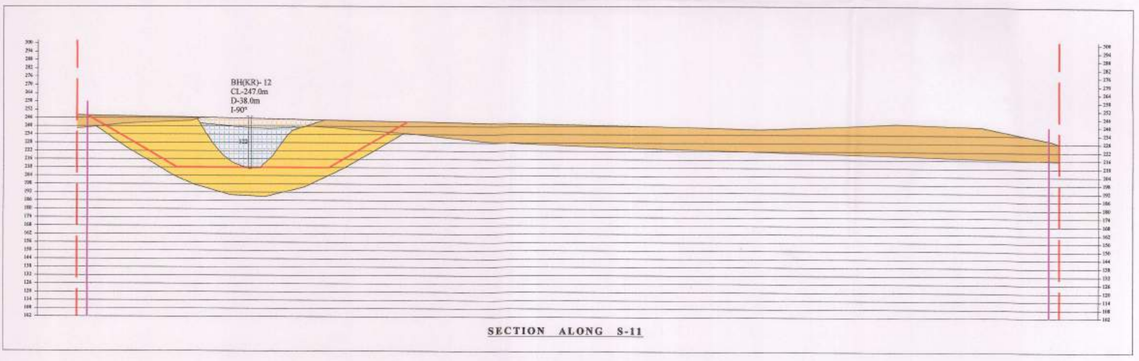


SECTION ALONG S-9

SECTION ALONG S-10



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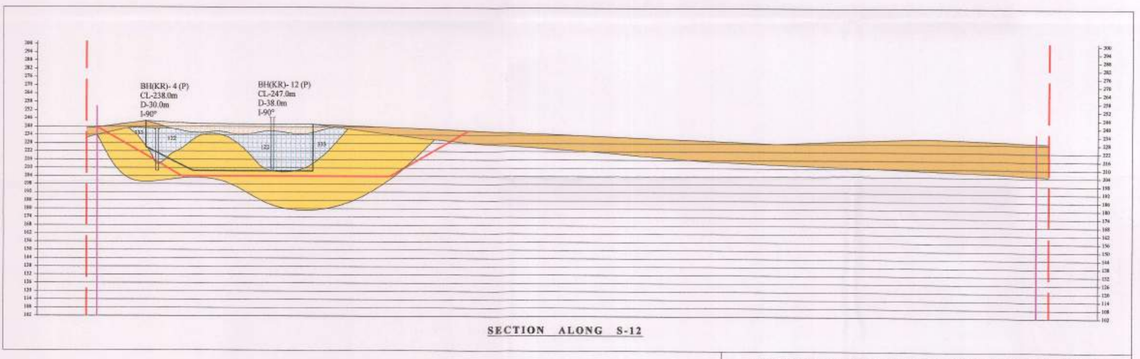


SECTION ALONG S-12

INDEX

- LATERITE
- LATERITIC LUMPY IRON ORE (+45% Fe)
- IRON ORE (+45% Fe)
- CLAYS (FERRUGINOUS/MANGANIFERROUS/PHYLLITIC)
- MN ORE
- LEASE BOUNDARY
- ULTIMATE PIT LIMIT
- 7.5 MTRS STATUTORY BARRIER

EXISTING BOREHOLES

BH(KR)-1 (BOREHOLE NUMBER)
CL (COLLAR LEVEL) = 228.5m
D (DEPTH) = 17.0m
I (INCLINATION) = 90°

ZAMBLIDADGA DONGOR IRON AND MANGANESE ORE MINE

LESSEE: LATE SHRI NARAINA SINAI QUIRTONIM

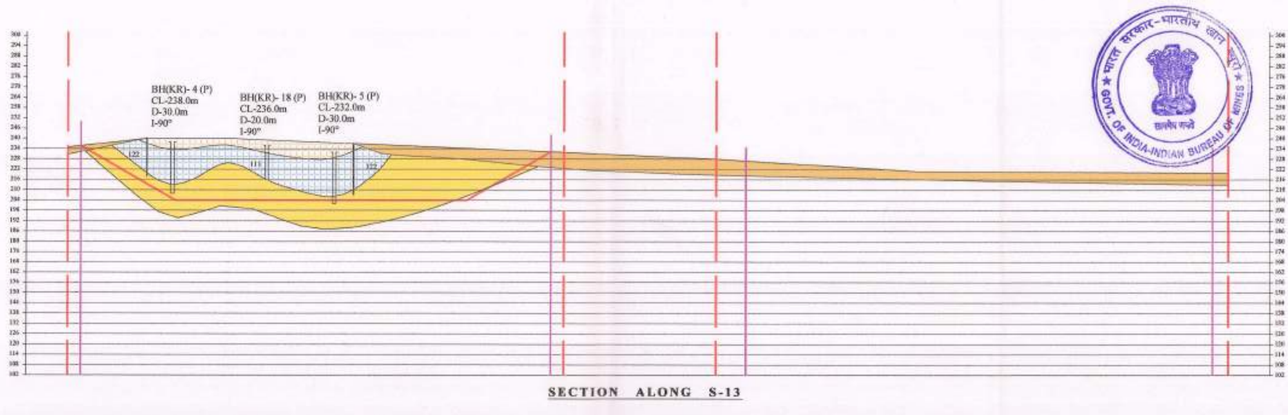
M.L. NO. 03/FeMn/79, AREA:70.20 Ha

VILLAGE CAVOREM (CAUREM), TALUKA QUEPEM, DISTRICT: SOUTH GOA

PURPOSE OF THE SECTION : - GEOLOGICAL CROSS SECTION

DATE	SCALE	
01 - 01 - 2022	1 : 2000	Certified that the Section is prepared based on the lease map authenticated by the State Government and is correct to the best of our knowledge Roshel Fernandes Qualified Person

PLATE No.4A



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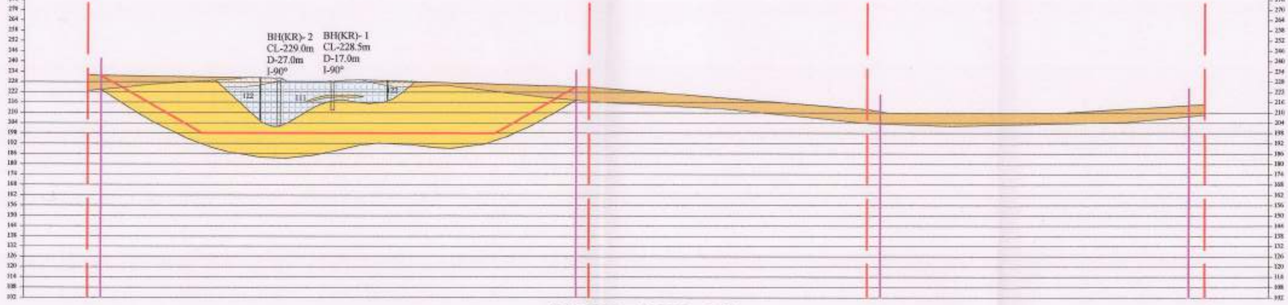

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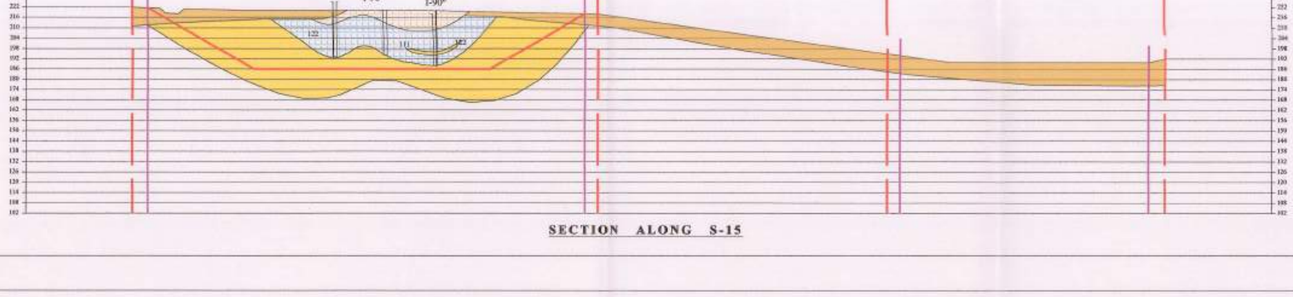

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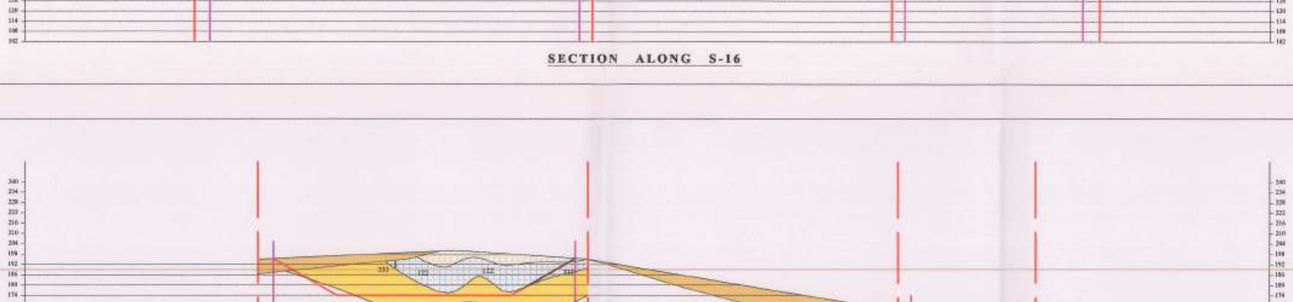

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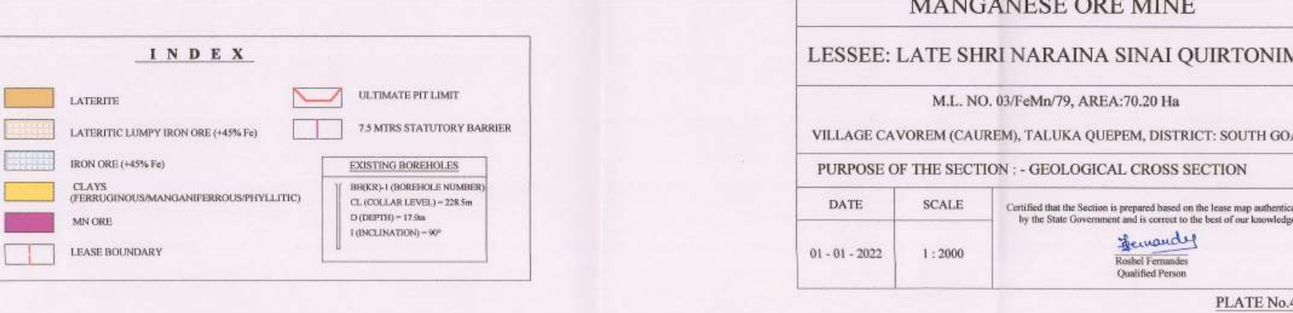


SECTION ALONG S-17

INDEX

- LATERITE
- LATERITIC LUMPY IRON ORE (+45% Fe)
- IRON ORE (+45% Fe)
- CLAYS (FERRUGINOUS/MANGANIFERROUS/PHYLLITIC)
- MN ORE
- LEASE BOUNDARY
- ULTIMATE PIT LIMIT
- 7.5 MTRS STATUTORY BARRIER

EXISTING BOREHOLES

BH(KR)-1 (BOREHOLE NUMBER)
CL (COLLAR LEVEL) = 228.5m
D (DEPTH) = 17.0m
I (INCLINATION) = 90°

ZAMBLIDADGA DONGOR IRON AND MANGANESE ORE MINE

LESSEE: LATE SHRI NARAINA SINAI QUIRTONIM

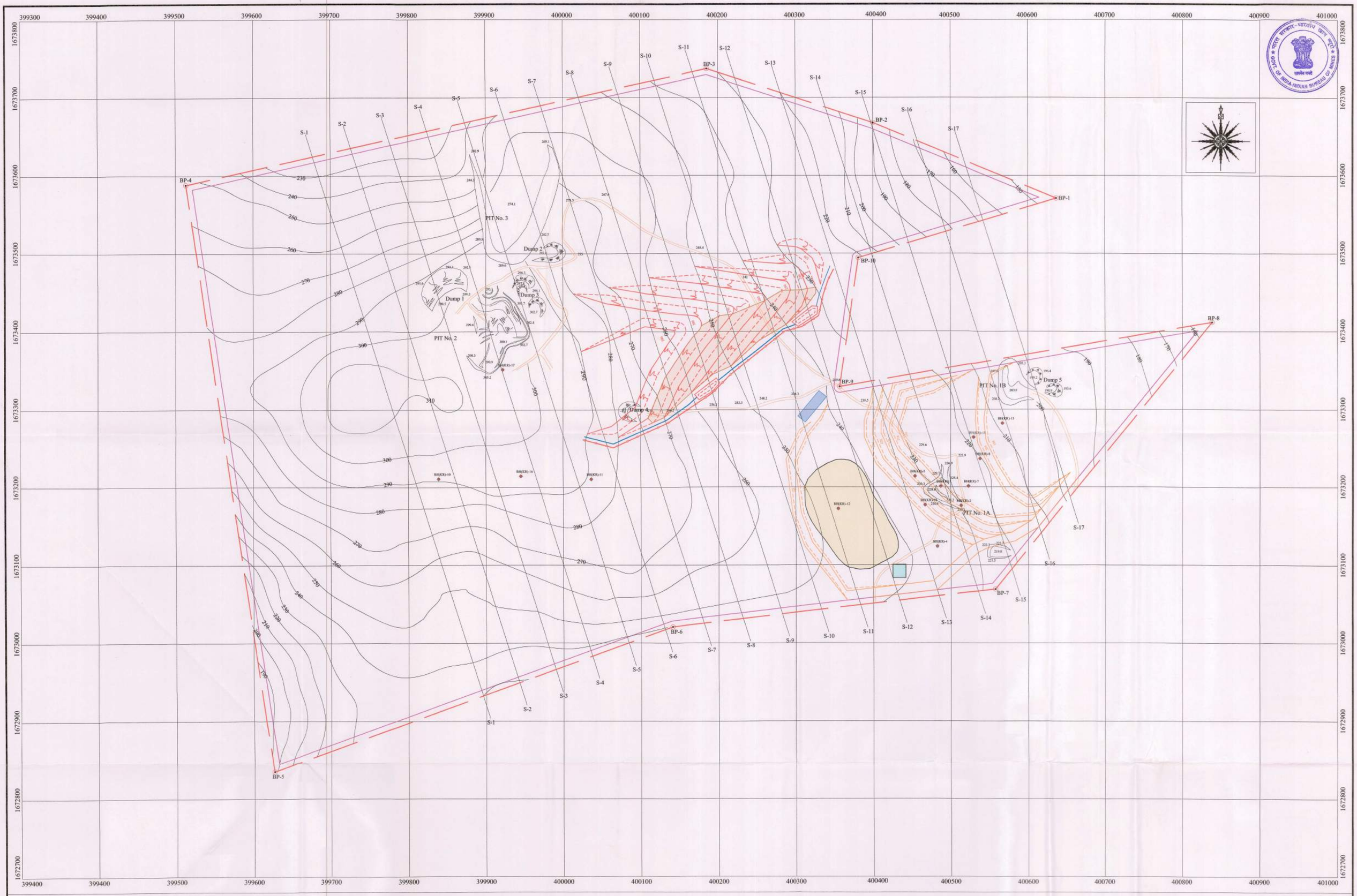
M.L. NO. 03/FeMn/79, AREA:70.20 Ha

VILLAGE CAVOREM (CAUREM), TALUKA QUEPEM, DISTRICT: SOUTH GOA

PURPOSE OF THE SECTION : - GEOLOGICAL CROSS SECTION

DATE	SCALE	Certified that the Section is prepared based on the lease map authenticated by the State Government and is correct to the best of our knowledge
01 - 01 - 2022	1 : 2000	Fernandes Roshel Fernandes Qualified Person

PLATE No.4B



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- LEASE BOUNDARY
- CONTOUR
- KACCHA ROAD
- OLD WORKING PIT
- WASTE DUMP
- BOREHOLE
- 7.5m STATUTORY BARRIER

PROPOSAL FOR 2023-24

- DUMPING
- EXCAVATION
- RUBBLE WALL
- TRENCH
- SETTLING POND
- INFRASTRUCTURE (Temporary)
- IRON ORE STACKING
- DRY SCREENING
- ROAD
- SOIL DISPOSAL AREA

SCALE - 1 : 2000

20 0 20 40 60 80 100 200 300 400 500

ZAMBLIDADGA DONGOR IRON AND MANGANESE ORE MINE

LESSEE: LATE SHRI NARAINA SINAI QUIRTONIM

M.L. NO. 03/FeMn/79, AREA:70.20 Ha

VILLAGE CAVOREM (CAUREM), TALUKA QUEPEM, DISTRICT: SOUTH GOA

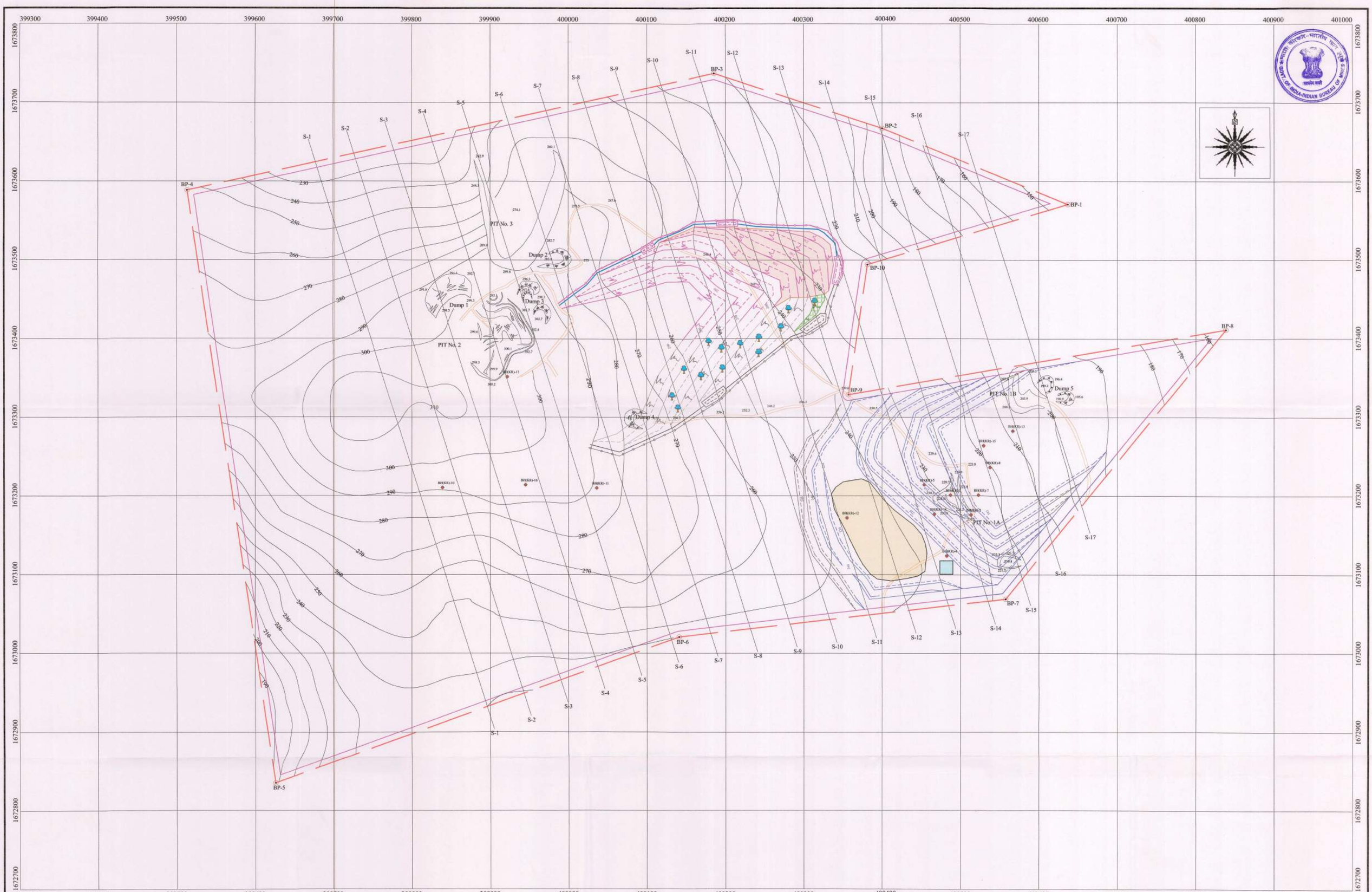
PURPOSE OF THE PLAN: PRODUCTION & DEVELOPMENT PLAN FOR 2023-24

PLAN No.	DATE	SCALE
DWG-3/1	01-01-2022	1 : 2000

Certified that the Plan is prepared based on the lease map authenticated by the State Government and is correct to the best of my knowledge

(Roshel Fernandes)
Qualified Person

PLATE No.5



INDEX

- LEASE BOUNDARY
- CONTOUR
- KACCHA ROAD
- OLD WORKING PIT
- WASTE DUMP
- BOREHOLE
- 7.5m STATUTORY BARRIER

PROPOSAL

For 2023-24	For 2024-25	
DUMPING	DUMPING	IRON ORE STACKING
EXCAVATION	EXCAVATION	DRY SCREENING
RUBBLE WALL	RUBBLE WALL	ROAD
TRENCH	TRENCH	SOIL DISPOSAL AREA
SETTLING POND	SETTLING POND	GEO-TEXTILE
	AFFORESTATION	

SCALE - 1 : 2000

20 0 20 40 60 80 100 200 300 400 500

ZAMBLIDADGA DONGOR IRON AND MANGANESE ORE MINE

LESSEE: LATE SHRI NARAINA SINAI QUIRTONIM

M.L. NO. 03/FeMn/79, AREA:70.20 Ha

VILLAGE CAVOREM (CAUREM), TALUKA QUEPEM, DISTRICT: SOUTH GOA

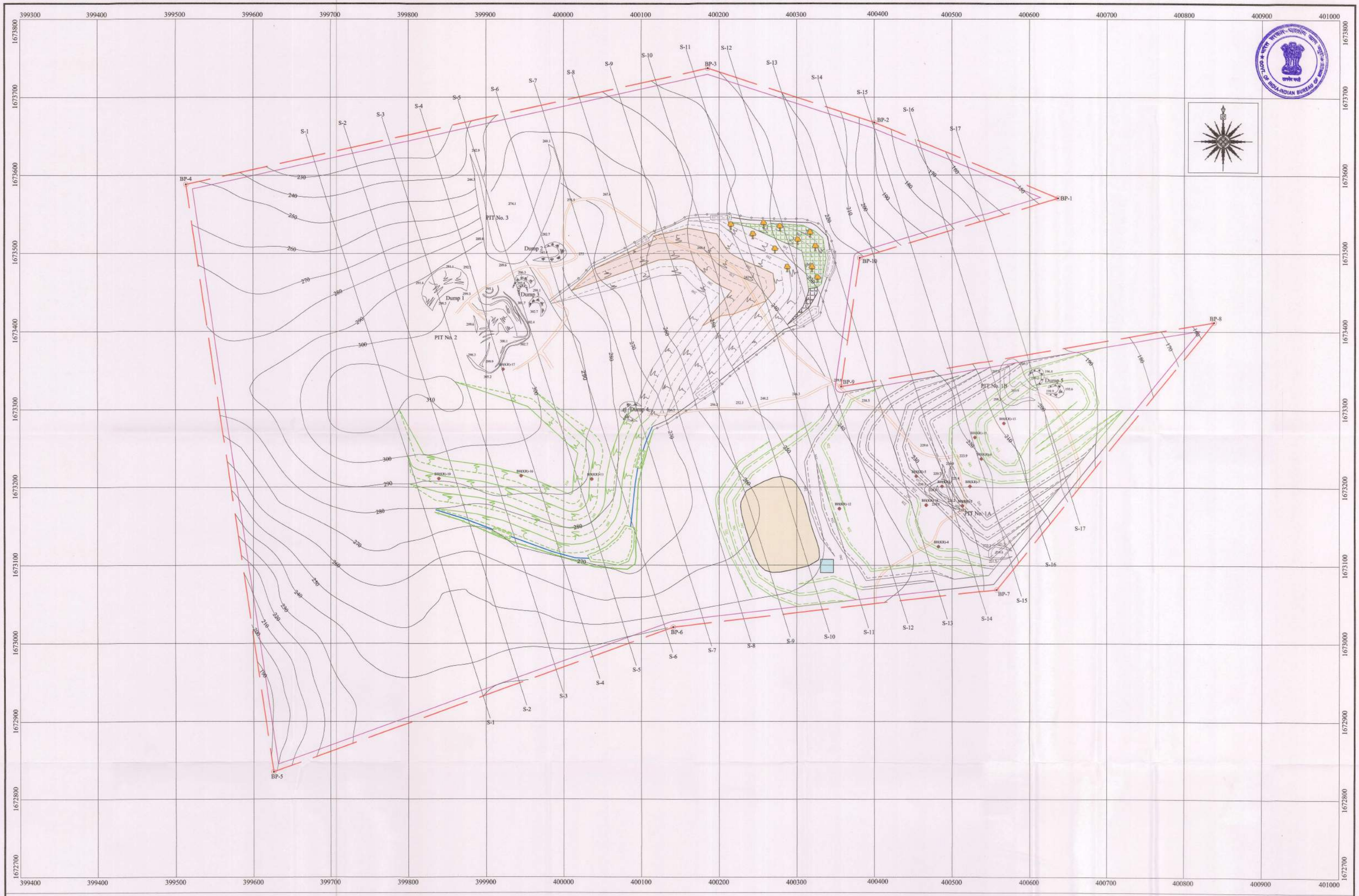
PURPOSE OF THE PLAN: PRODUCTION & DEVELOPMENT PLAN FOR 2024-25

PLAN No.	DATE	SCALE
DWG-3/2	01-01-2022	1 : 2000

Certified that the Plan is prepared based on the lease map authenticated by the State Government and is correct to the best of my knowledge

(Roshel Fernandes)
Qualified Person

PLATE No.5A



INDEX

- LEASE BOUNDARY
- CONTOUR
- KACCHA ROAD
- OLD WORKING PIT
- WASTE DUMP
- BOREHOLE
- 7.5m STATUTORY BARRIER

PROPOSAL

For 2024-25	For 2025-26	
DUMPING	DUMPING	IRON ORE STACKING
EXCAVATION	EXCAVATION	DRY SCREENING
TRENCH	TRENCH	ROAD
RUBBLE WALL	RUBBLE WALL	SOIL DISPOSAL AREA
SETTLING POND	SETTLING POND	GEO-TEXTILE
ROAD	AFFORESTATION	
GEO-TEXTILE		

SCALE - 1 : 2000

20 0 20 40 60 80 100 200 300 400 500

ZAMBLIDADGA DONGOR IRON AND MANGANESE ORE MINE

LESSEE: LATE SHRI NARAINA SINAI QUIRTONIM

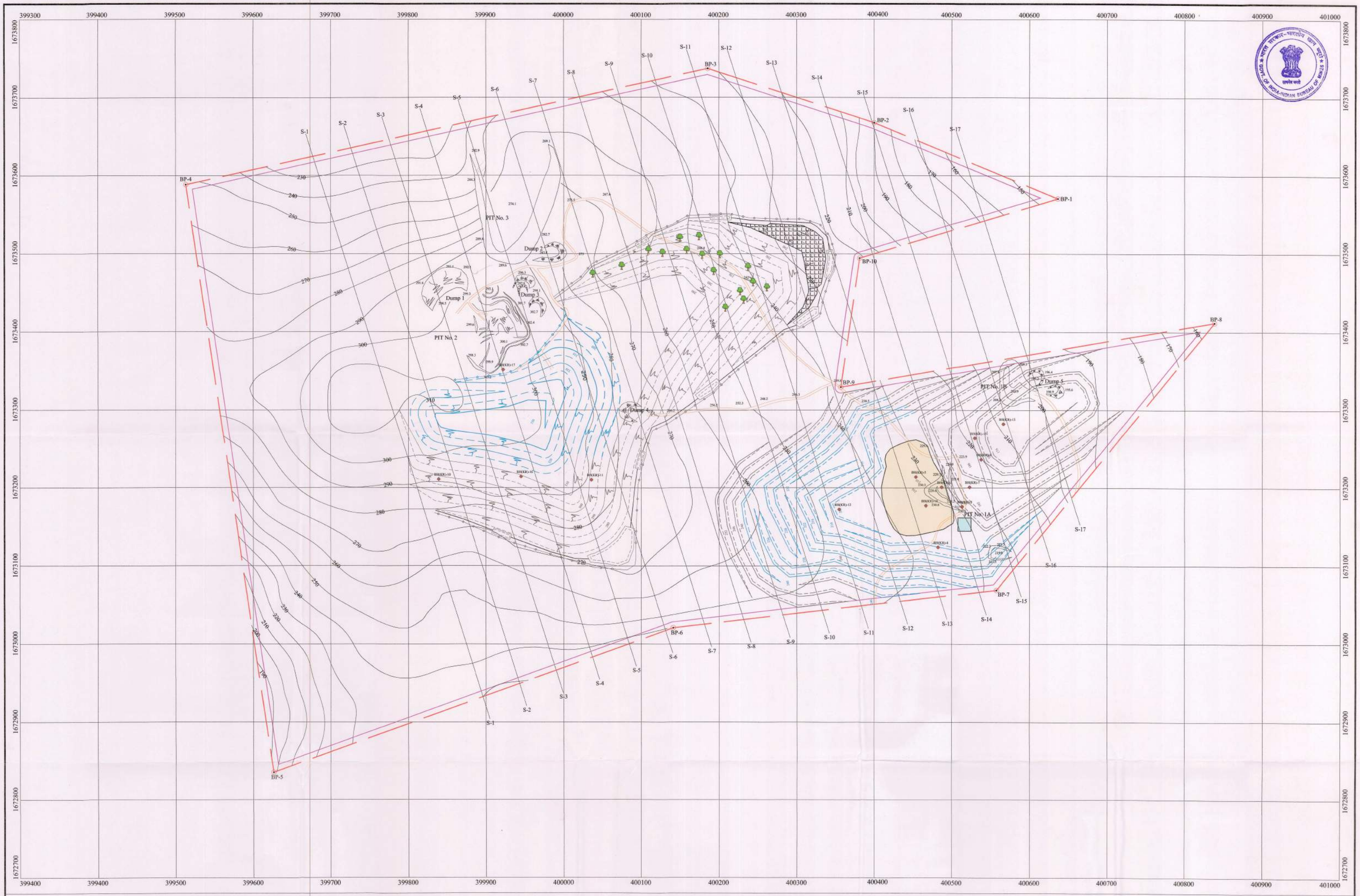
M.L. NO. 03/FeMn/79, AREA:70.20 Ha

VILLAGE CAVOREM (CAUREM), TALUKA QUEPEM, DISTRICT: SOUTH GOA

PURPOSE OF THE PLAN: PRODUCTION & DEVELOPMENT PLAN FOR 2025-26

PLAN No.	DATE	SCALE	Certified that the Plan is prepared based on the lease map authenticated by the State Government and is correct to the best of my knowledge
DWG-3/3	01-01-2022	1 : 2000	(Rothel Fernandes) Qualified Person

PLATE No.5B



INDEX

- LEASE BOUNDARY
- CONTOUR
- KACCHA ROAD
- OLD WORKING PIT
- WASTE DUMP
- BOREHOLE
- 7.5m STATUTORY BARRIER

PROPOSAL

For 2025-26	For 2026-27
DUMPING	DUMPING
EXCAVATION	EXCAVATION
TRENCH	RUBBLE WALL
RUBBLE WALL	IRON ORE STACKING
SETTLING POND	DRY SCREENING
GEOTEXTILE	AFFORESTATION

SCALE - 1 : 2000

20 0 20 40 60 80 100 200 300 400 500

ZAMBLIDADGA DONGOR IRON AND MANGANESE ORE MINE

LESSEE: LATE SHRI NARAINA SINAI QUIRTONIM

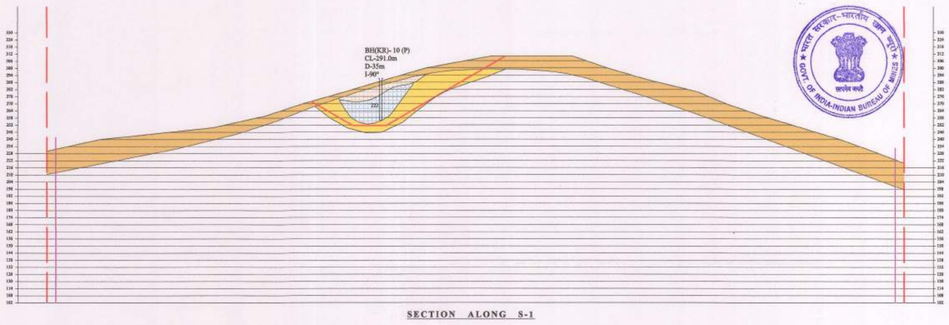
M.L. NO. 03/FeMn/79, AREA:70.20 Ha

VILLAGE CAVOREM (CAUREM), TALUKA QUEPEM, DISTRICT: SOUTH GOA

PURPOSE OF THE PLAN: PRODUCTION & DEVELOPMENT PLAN FOR 2026-27

PLAN No.	DATE	SCALE	Certified that the Plan is prepared based on the lease map authenticated by the State Government and is correct to the best of my knowledge
DWG-3/4	01-01-2022	1 : 2000	(Roshel Fernandes) Qualified Person

PLATE No.5C



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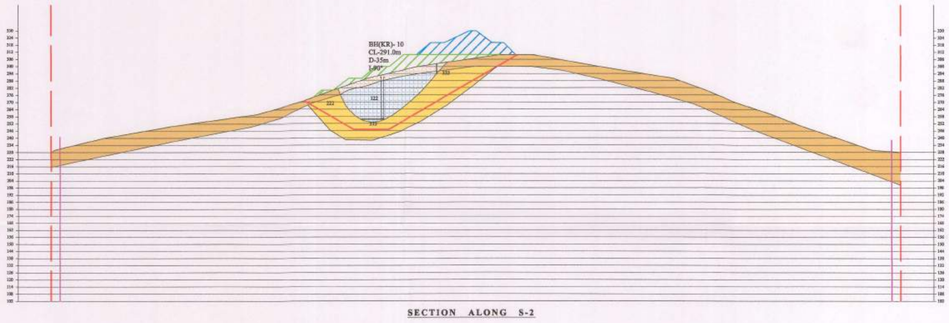

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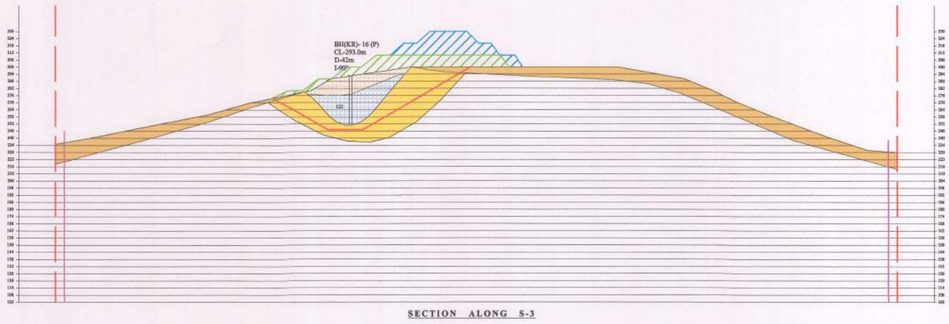

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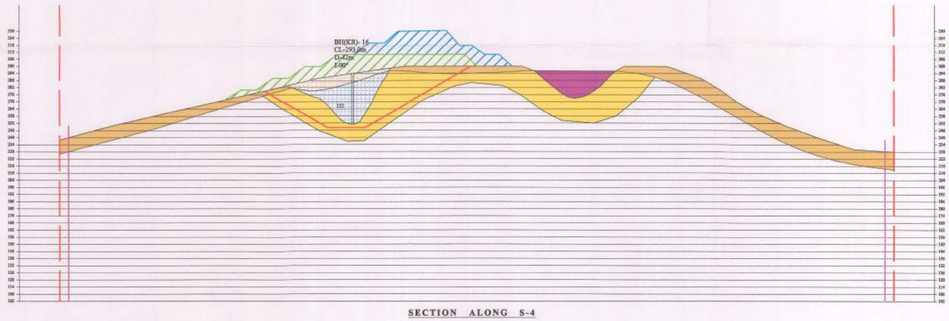

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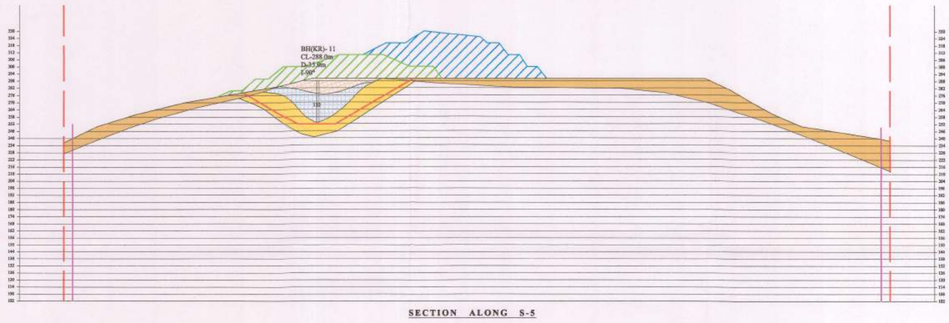

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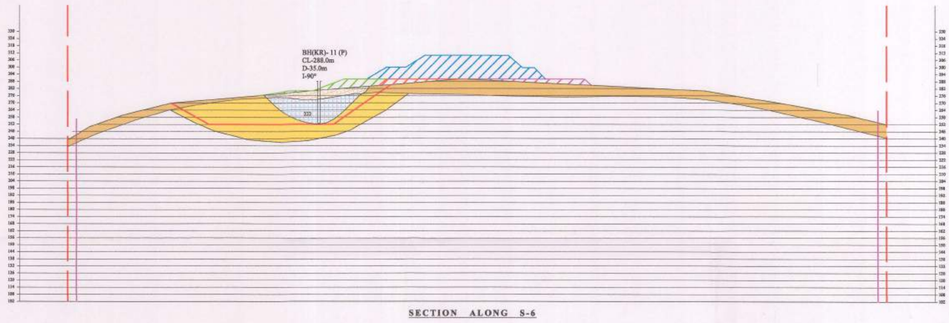


SECTION ALONG S-6

INDEX

- LATERITE
- LATERITIC LUMPY IRON ORE (+45% Fe)
- IRON ORE (+45% Fe)
- CLAYS (FERRUGINOUS/MANGANIFERROUS/PHYLLITIC)
- MN ORE
- LEASE BOUNDARY
- ULTIMATE PIT LIMIT
- 7.5 MTRS STATUTORY BARRIER

EXISTING BOREHOLES

BH(ICR)-1 (BOREHOLE NUMBER)
CL (COLLAR LEVEL) = 228.5m
D (DEPTH) = 17.0m
I (INCLINATION) = 90°

PROPOSAL		
YEAR	PIT POSITION	DUMPING
2023-24		
2024-25		
2025-26		
2026-27		

ZAMBLIDADGA DONGOR IRON AND MANGANESE ORE MINE

LESSEE: LATE SHRI NARAINA SINAI QUIRTONIM

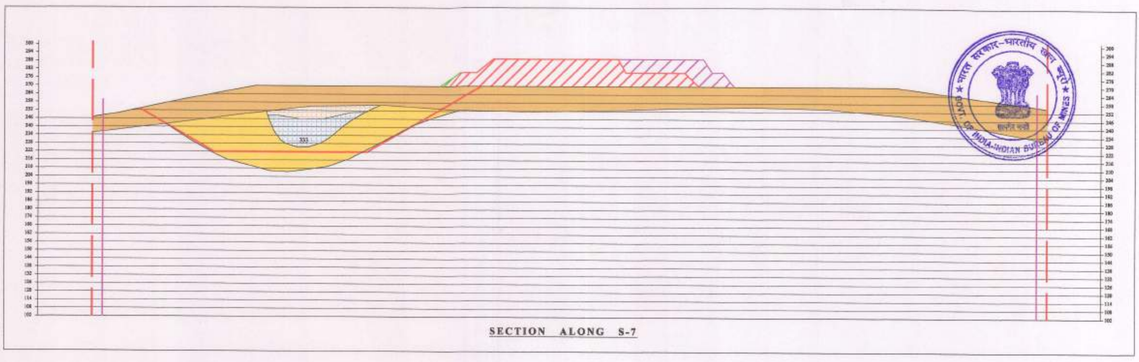
M.L. NO. 03/FeMn/79, AREA:70.20 Ha

VILLAGE CAVOREM (CAUREM), TALUKA QUEPEM, DISTRICT: SOUTH GOA

PURPOSE OF THE SECTION : - GEOLOGICAL CROSS SECTION SHOWING PROPOSED EXCAVATION AND WASTE DUMPING

DATE	SCALE	
01 - 01 - 2022	1 : 2000	Certified that the Section is prepared based on the lease map authenticated by the State Government and is correct to the best of our knowledge Rashel Fernandes Qualified Person

PLATE No.6



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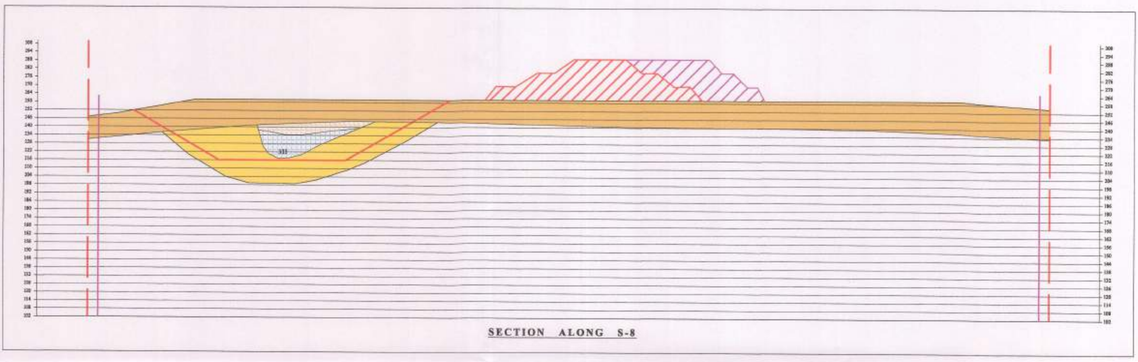

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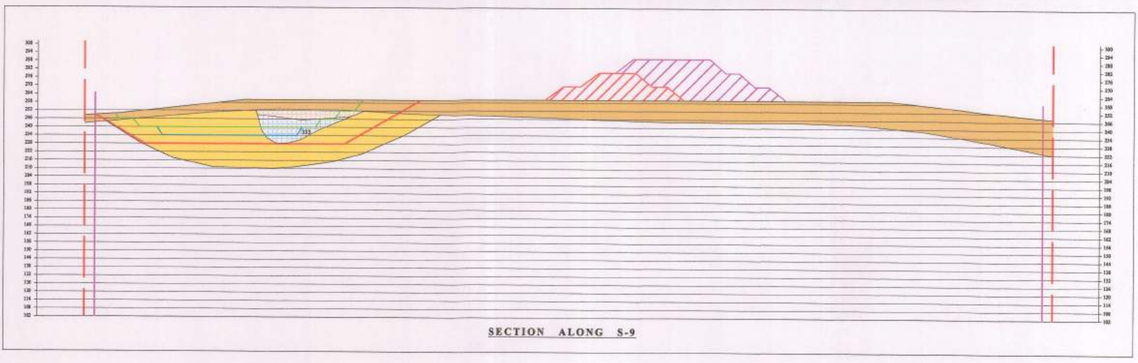

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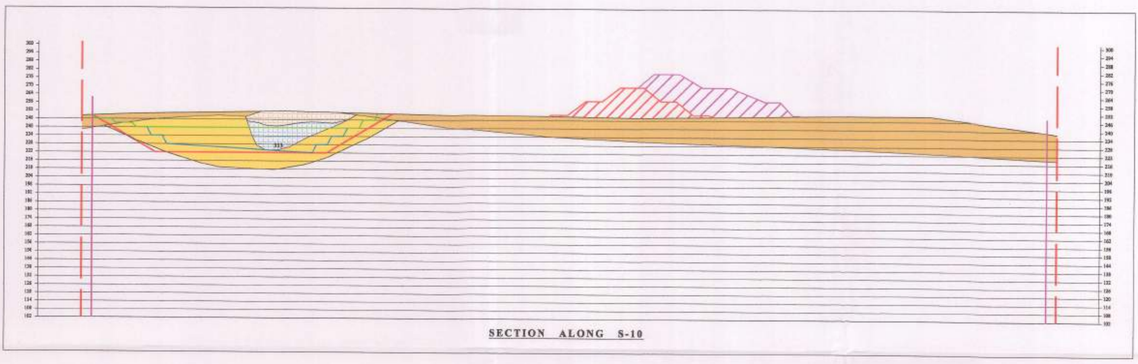
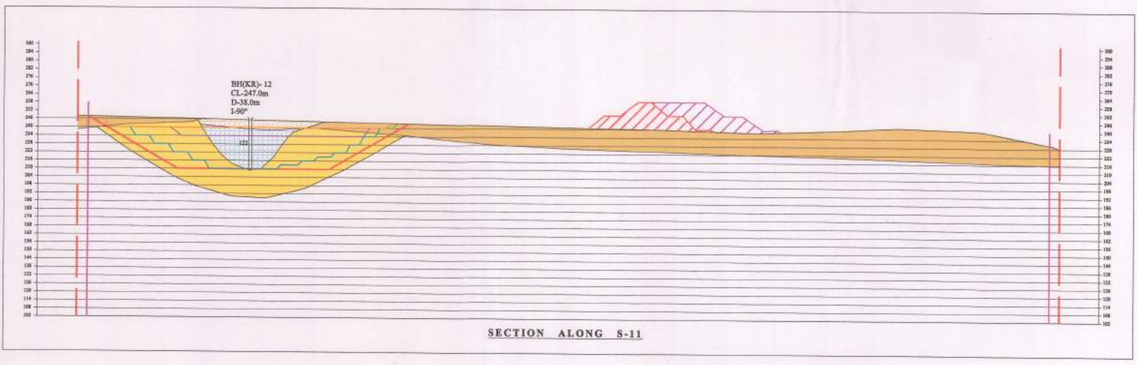


SECTION ALONG S-10



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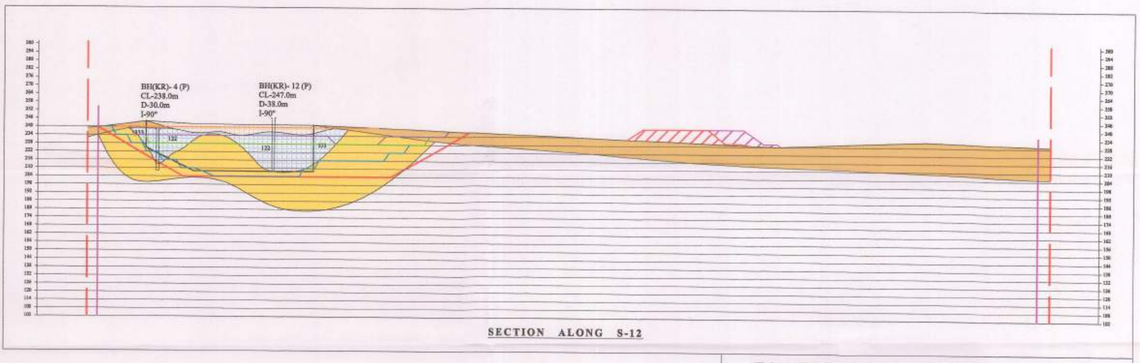


SECTION ALONG S-12

INDEX

- LATERITE
- LATERITIC LUMPY IRON ORE (+45% Fe)
- IRON ORE (+45% Fe)
- CLAYS (FERRUGINOUS/MANGANIFERROUS/PHYLLITIC)
- MN ORE
- LEASE BOUNDARY
- ULTIMATE PIT LIMIT
- 7.5 MTRS STATUTORY BARRIER

EXISTING BOREHOLES

BH(KR)-1 (BOREHOLE NUMBER)
CL (COLLAR LEVEL) = 228.5m
D (DEPTH) = 17.0m
I (INCLINATION) = 90°

PROPOSAL		
YEAR	PIT POSITION	DUMPING
2023-24		
2024-25		
2025-26		
2026-27		

ZAMBLIDADGA DONGOR IRON AND MANGANESE ORE MINE

LESSEE: LATE SHRI NARAINA SINAI QUIRTONIM

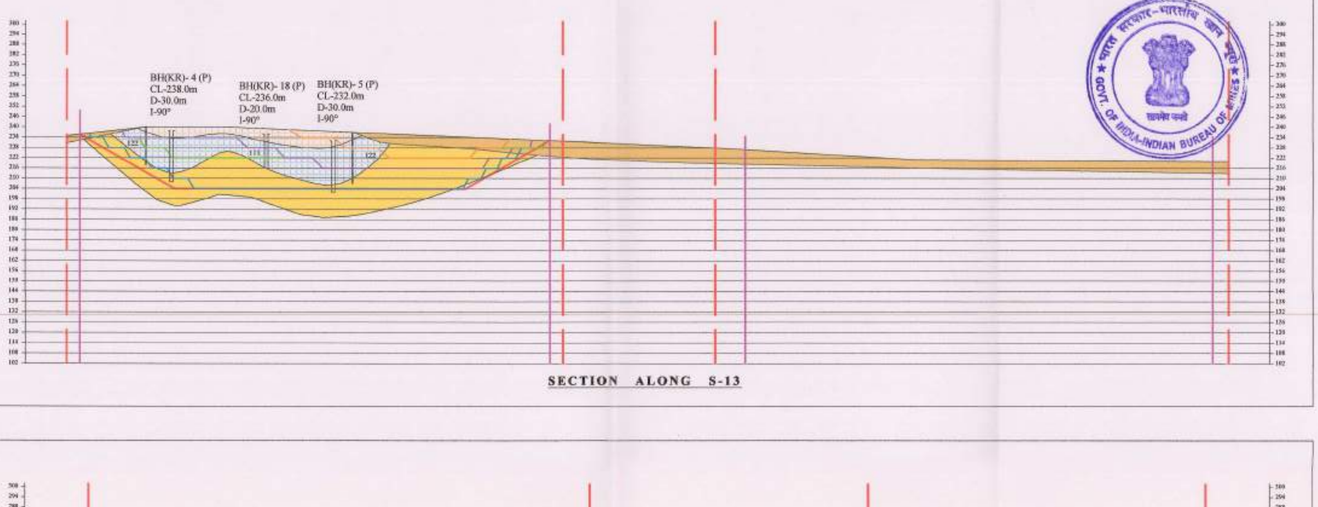
M.L. NO. 03/FeMn/79, AREA:70.20 Ha

VILLAGE CAVOREM (CAUREM), TALUKA QUEPEM, DISTRICT: SOUTH GOA

PURPOSE OF THE SECTION : - GEOLOGICAL CROSS SECTION SHOWING PROPOSED EXCAVATION AND WASTE DUMPING

DATE	SCALE	
01 - 01 - 2022	1 : 2000	Certified that the Section is prepared based on the lease map authenticated by the State Government and is correct to the best of our knowledge Roshel Fernandes Qualified Person

PLATE No.6A



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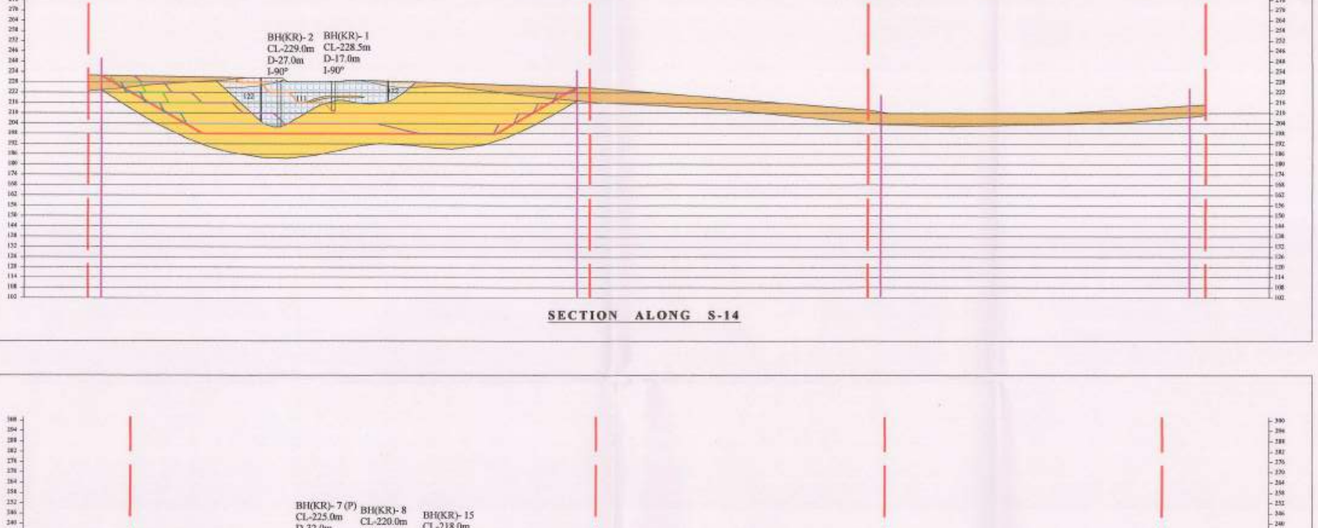

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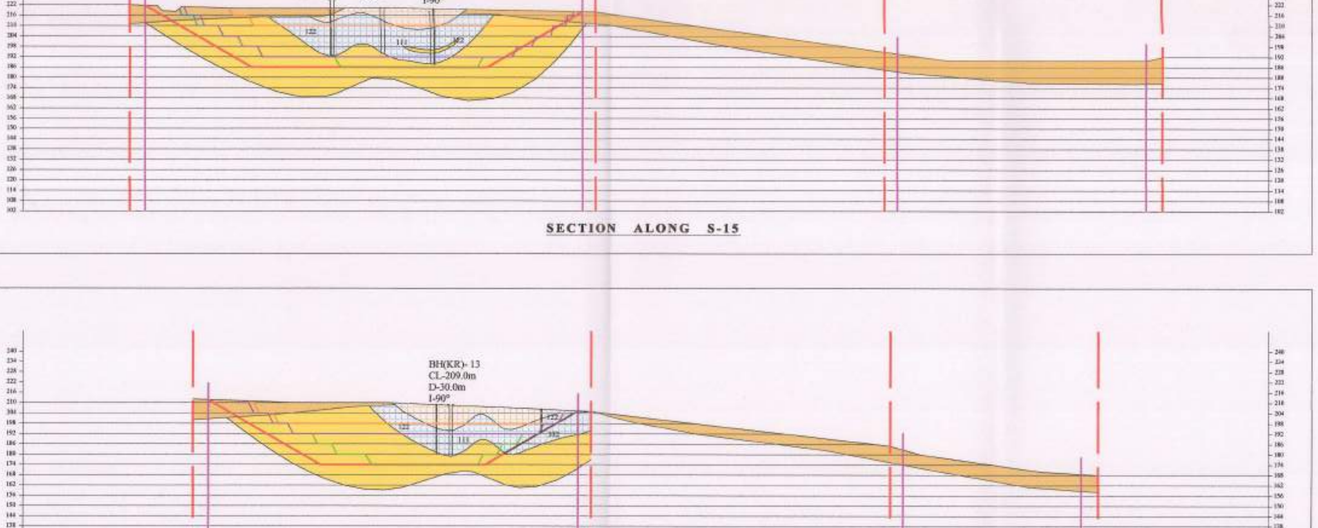
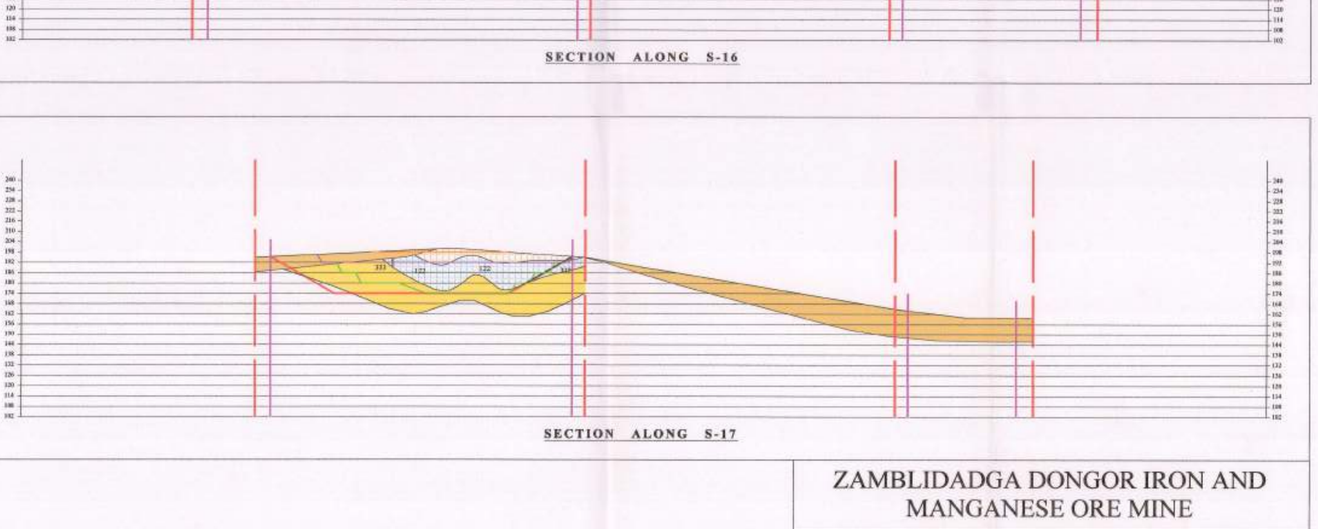


SECTION ALONG S-15



SECTION ALONG S-16

SECTION ALONG S-17

INDEX

- LATERITE
- LATERITIC LUMPY IRON ORE (+45% Fe)
- IRON ORE (+45% Fe)
- CLAYS (FERRUGINOUS/MANGANIFERROUS/PHYLLITIC)
- MN ORE
- LEASE BOUNDARY
- ULTIMATE PIT LIMIT
- 7.5 MTRS STATUTORY BARRIER

EXISTING BOREHOLES

BH(KR)-1 (BOREHOLE NUMBER)
CL (COLLAR LEVEL) = 228.5m
D (DEPTH) = 17.0m
I (INCLINATION) = 90°

PROPOSAL		
YEAR	PIT POSITION	DUMPING
2023-24		
2024-25		
2025-26		
2026-27		

ZAMBLIDADGA DONGOR IRON AND MANGANESE ORE MINE

LESSEE: LATE SHRI NARAINA SINAI QUIRTONIM

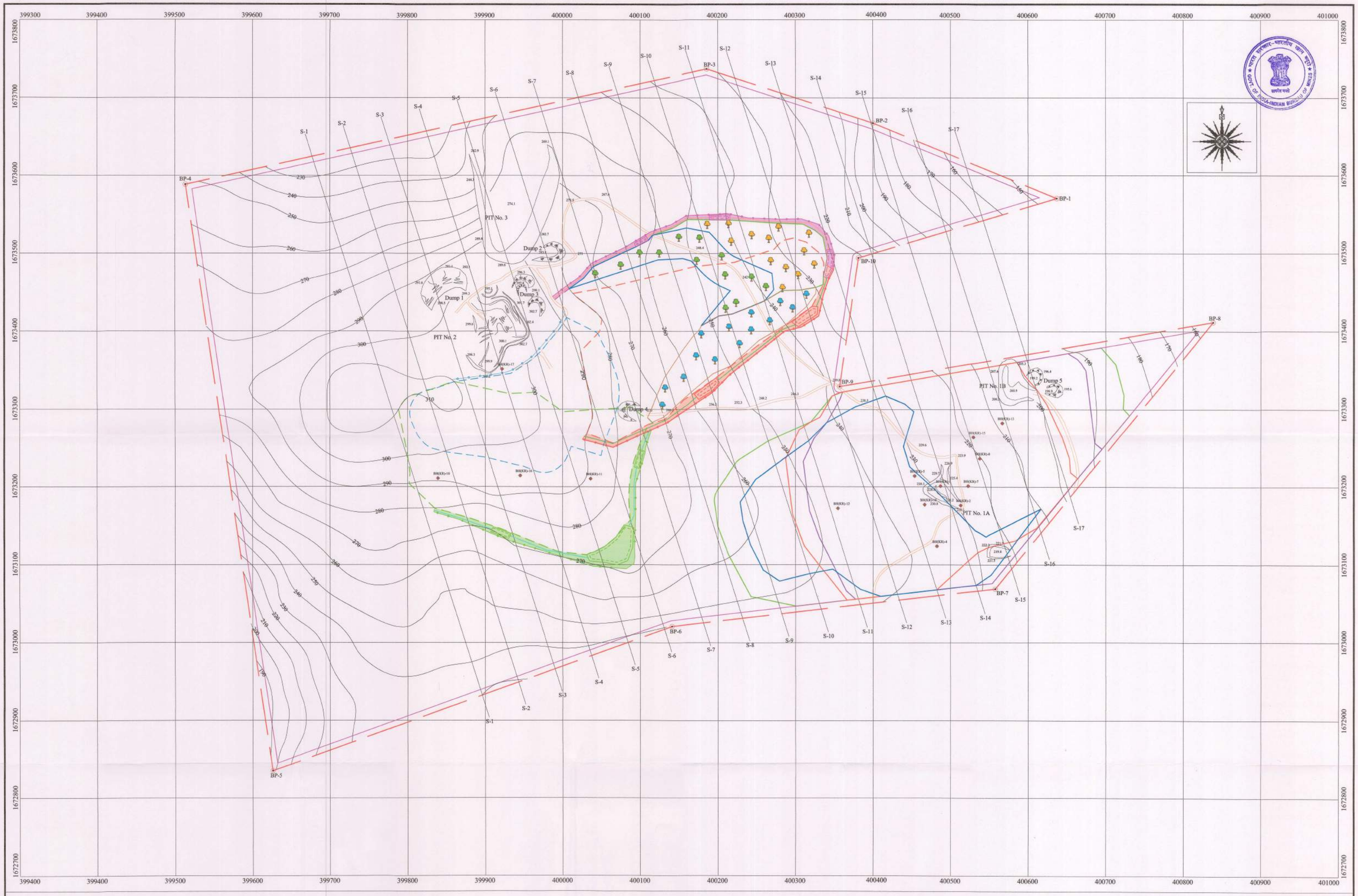
M.L. NO. 03/FeMn/79, AREA:70.20 Ha

VILLAGE CAVOREM (CAUREM), TALUKA QUEPEM, DISTRICT: SOUTH GOA

PURPOSE OF THE SECTION :- GEOLOGICAL CROSS SECTION SHOWING PROPOSED EXCAVATION AND WASTE DUMPING

DATE	SCALE	
01 - 01 - 2022	1 : 2000	Certified that the Section is prepared based on the lease map authenticated by the State Government and is correct to the best of our knowledge Roshel Fernandes Qualified Person

PLATE No.6B



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- LEASE BOUNDARY
- CONTOUR
- KACCHA ROAD
- OLD WORKING PIT
- WASTE DUMP
- BOREHOLE
- 7.5m STATUTORY BARRIER

PROPOSAL

YEAR	PIT POSITION	DUMPING	Protective Measures	Afforestation	Trench	Settling Pond	Rubble wall
2023-24							
2024-25							
2025-26							
2026-27							

SCALE - 1 : 2000

20 0 20 40 60 80 100 200 300 400 500

ZAMBLIDADGA DONGOR IRON AND MANGANESE ORE MINE

LESSEE: LATE SHRI NARAINA SINAI QUIRTONIM

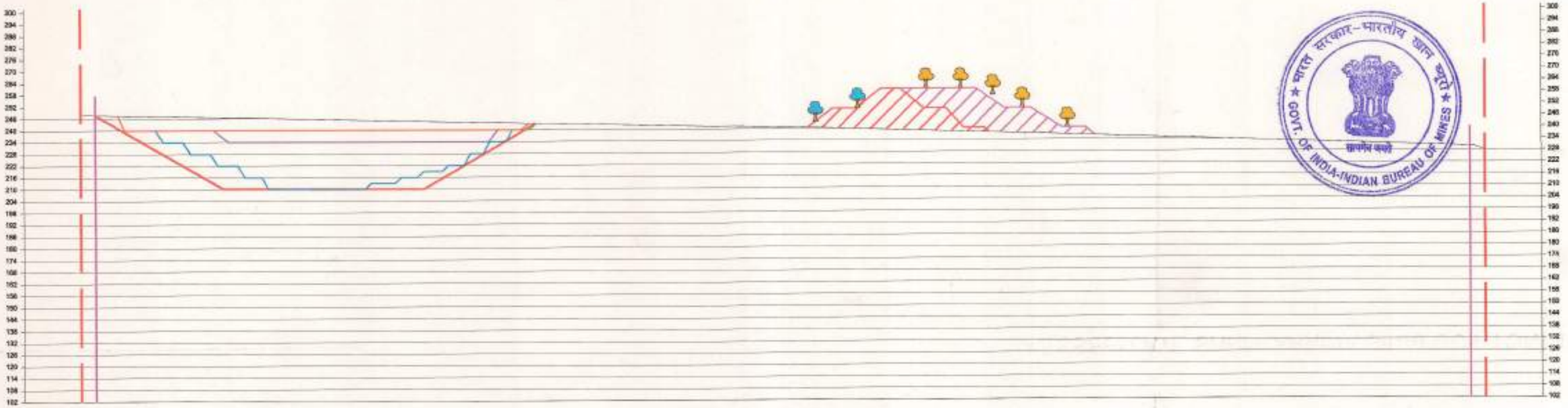
M.L. NO. 03/FeMn/79, AREA:70.20 Ha

VILLAGE CAVOREM (CAUREM), TALUKA QUEPEM, DISTRICT: SOUTH GOA

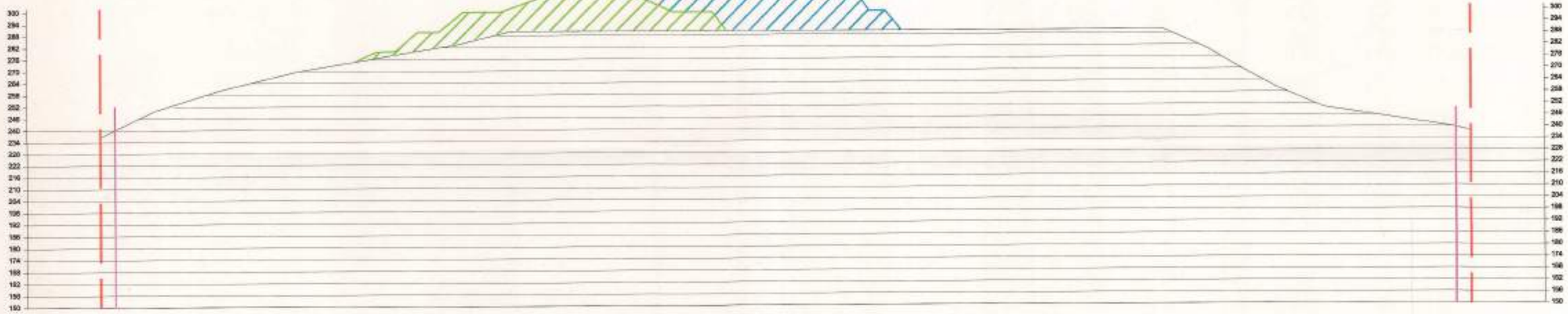
PURPOSE OF THE PLAN: PROGRESSIVE MINE CLOSURE PLAN

PLAN No.	DATE	SCALE	Certified that the Plan is prepared based on the lease map authenticated by the State Government and is correct to the best of my knowledge
DWG-4	01-01-2022	1 : 2000	(Roshel Fernandes) Qualified Person

PLATE No.7



SECTION ALONG S-11



SECTION ALONG S-5

PROPOSAL			
YEAR	PIT POSITION	DUMPING	AFFORESTATION
2023-24			
2024-25			
2025-26			
2026-27			

Index

Lease Boundary

7.5 MTRS STATUTORY BARRIER

ZAMBLIDADGA DONGOR IRON AND MANGANESE ORE MINE

LESSEE: LATE SHRI NARAINA SINAI QUIRTONIM

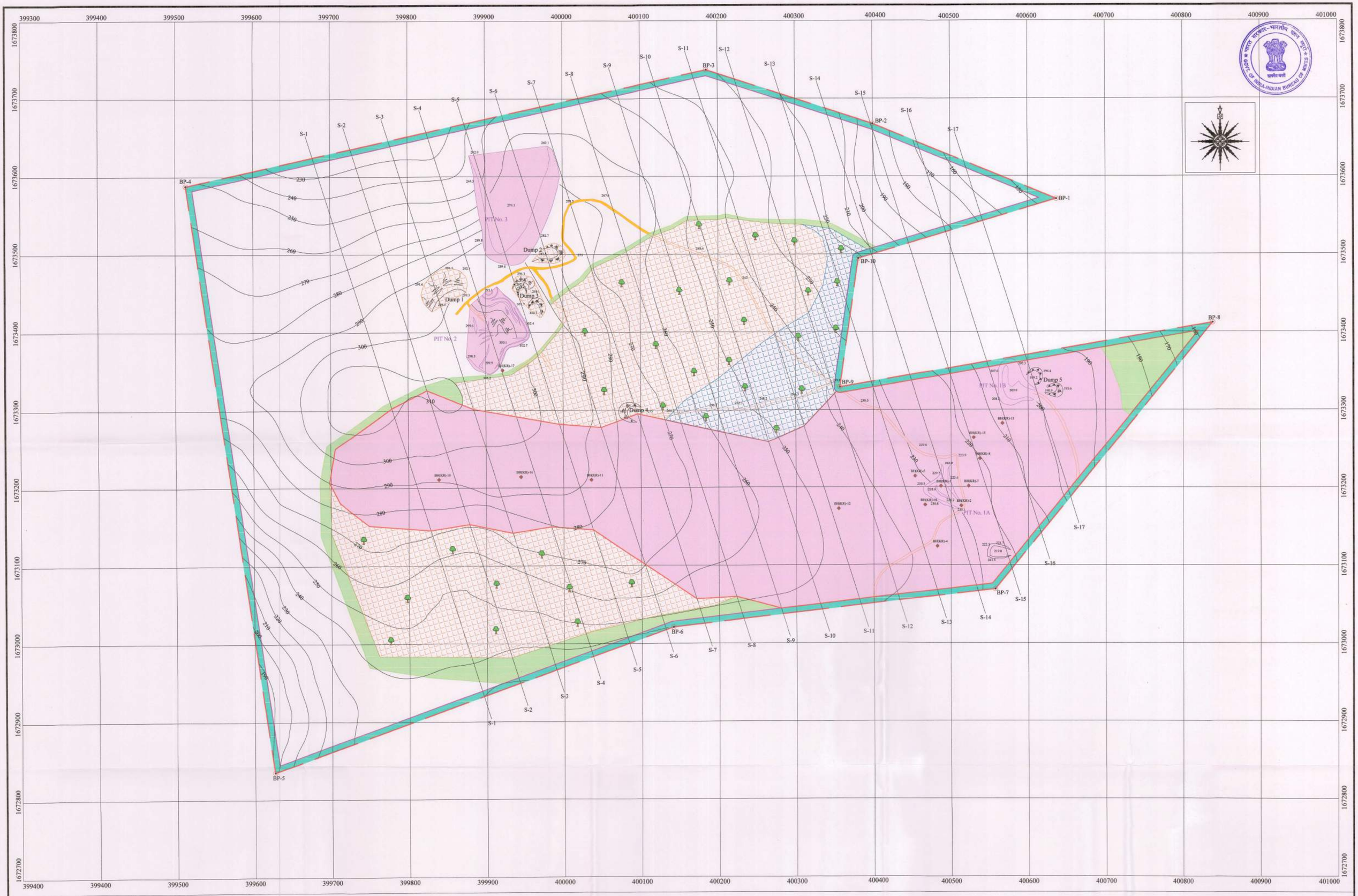
M.L. NO. 03/FeMn/79, AREA:70.20 Ha

VILLAGE CAVOREM (CAUREM), TALUKA QUEPEM, DISTRICT: SOUTH GOA

PURPOSE OF THE SECTION : -PROGRESSIVE MINE CLOSURE SECTION

DATE	SCALE	Certified that the Section is prepared based on the lease map authenticated by the State Government and is correct to the best of our knowledge
01 - 01 - 2022	1 : 2000	Roshel Fernandes Qualified Person

PLATE No.8



INDEX

- LEASE BOUNDARY
- CONTOUR
- KACCHA ROAD
- OLD WORKING PIT
- WASTE DUMP
- BOREHOLE
- 7.5m STATUTORY BARRIER

LANDUSE AT THE END OF CONCEPTUAL PLAN

- MINING PIT
- DUMP
- AREA UNDER UTILITY SERVICES
- PROTECTIVE MEASURES
- ROAD
- PLANTATION
- SAFETY ZONE
- ULTIMATE PIT LIMIT

SCALE - 1 : 2000

20 0 20 40 60 80 100 200 300 400 500

ZAMBLIDADGA DONGOR IRON AND MANGANESE ORE MINE

LESSEE: LATE SHRI NARAINA SINAI QUIRTONIM

M.L. NO. 03/FeMn/79, AREA:70.20 Ha

VILLAGE CAVOREM (CAUREM), TALUKA QUEPEM, DISTRICT: SOUTH GOA

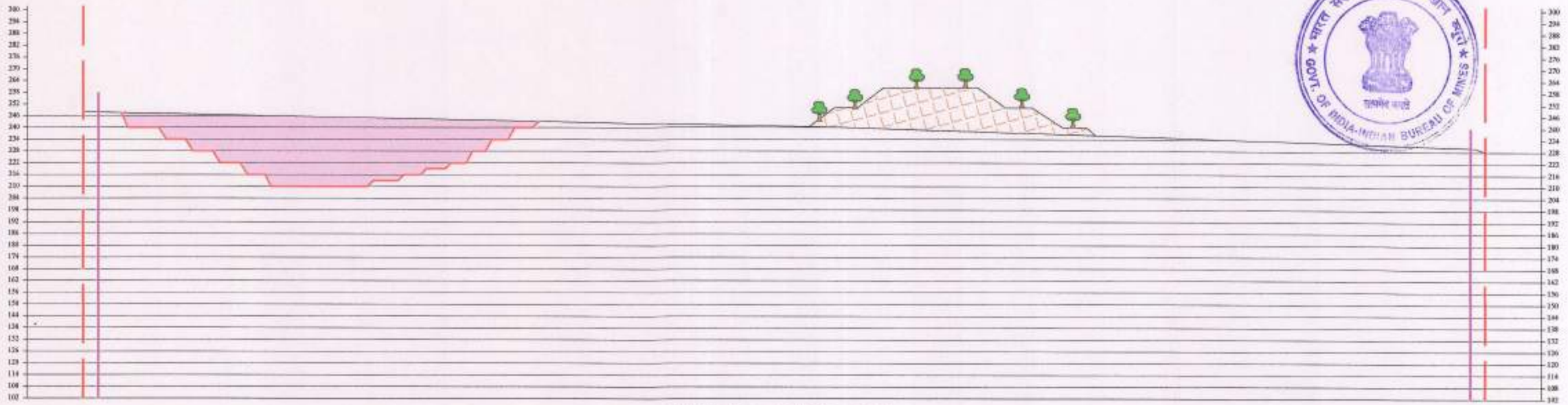
PURPOSE OF THE PLAN: CONCEPTUAL PLAN

PLAN No.	DATE	SCALE
DWG-5	01-01-2022	1 : 2000

Certified that the Plan is prepared based on the lease map authenticated by the State Government and is correct to the best of my knowledge

(Roshel Fernandes)
Qualified Person

PLATE No.9



SECTION ALONG S-11

LANDUSE AT THE END OF CONCEPTUAL PLAN

- Mining Pit
- Dump
- Plantation

Index

- Lease Boundary
- 7.5 mtrs Statutory Barrier

ZAMBLIDADGA DONGOR IRON AND MANGANESE ORE MINE

LESSEE: LATE SHRI NARAINA SINAI QUIRTONIM

M.L. NO. 03/FeMn/79, AREA:70.20 Ha

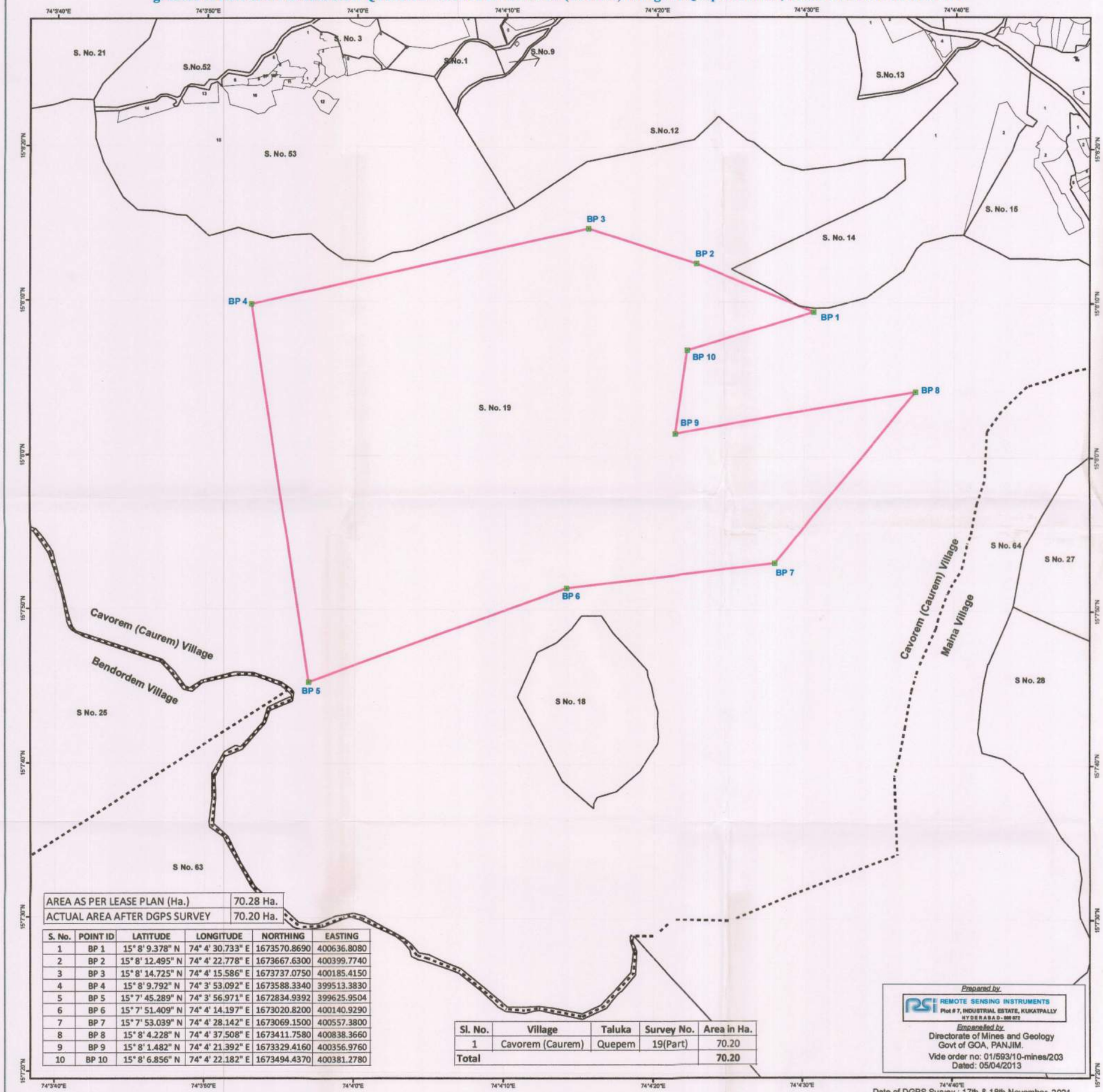
VILLAGE CAVOREM (CAUREM), TALUKA QUEPEM, DISTRICT: SOUTH GOA

PURPOSE OF THE SECTION : - CONCEPTUAL SECTION

DATE	SCALE	Certified that the Section is prepared based on the lease map authenticated by the State Government and is correct to the best of our knowledge
01 - 01 - 2022	1 : 2000	Roshel Fernandes Qualified Person

PLATE No.9A

Geo - Referenced Cadastral Map of "Zamblidadga Dongor Iron and Manganese Ore Mining Lease", bearing M.L. No. 3/Fe-Mn/79, granted to Late Shri Naraina Sinai Quirtonim situated in Cavorem (Caurem) Village of Quepem Taluka, South Goa District. Goa State



AREA AS PER LEASE PLAN (Ha.)	70.28 Ha.
ACTUAL AREA AFTER DGPS SURVEY	70.20 Ha.

S. No.	POINT ID	LATITUDE	LONGITUDE	NORTHING	EASTING
1	BP 1	15° 8' 9.378" N	74° 4' 30.733" E	1673570.8690	400636.8080
2	BP 2	15° 8' 12.495" N	74° 4' 22.778" E	1673667.6300	400399.7740
3	BP 3	15° 8' 14.725" N	74° 4' 15.586" E	1673737.0750	400185.4150
4	BP 4	15° 8' 9.792" N	74° 3' 53.092" E	1673588.3340	399513.3830
5	BP 5	15° 7' 45.289" N	74° 3' 56.971" E	1672834.9392	399625.9504
6	BP 6	15° 7' 51.409" N	74° 4' 14.197" E	1673020.8200	400140.9290
7	BP 7	15° 7' 53.039" N	74° 4' 28.142" E	1673069.1500	400557.3800
8	BP 8	15° 8' 4.228" N	74° 4' 37.508" E	1673411.7580	400838.3660
9	BP 9	15° 8' 1.482" N	74° 4' 21.392" E	1673329.4160	400356.9760
10	BP 10	15° 7' 6.856" N	74° 4' 22.182" E	1673494.4370	400381.2780

Sl. No.	Village	Taluka	Survey No.	Area in Ha.
1	Cavorem (Caurem)	Quepem	19(Part)	70.20
Total				70.20

Prepared by
REMOTE SENSING INSTRUMENTS
Plot # 7, INDUSTRIAL ESTATE, KUKATPALLY
HYDERABAD - 500 072
Empanelled by
Directorate of Mines and Geology
Govt of GOA, PANJIM.
Vide order no: 01/593/10-mines/203
Dated: 05/04/2013

Date of DGPS Survey : 17th & 18th November, 2021

SCALE 1:3,960

0 50 100 200 300 400 500 Meters

Legend

- DGPS POINT OF LEASE BOUNDARY
- LEASE BOUNDARY AS PER DGPS SURVEY
- SURVEY No BOUNDARY
- SUB-DIVISION OF THE SURVEY No
- VILLAGE BOUNDARY

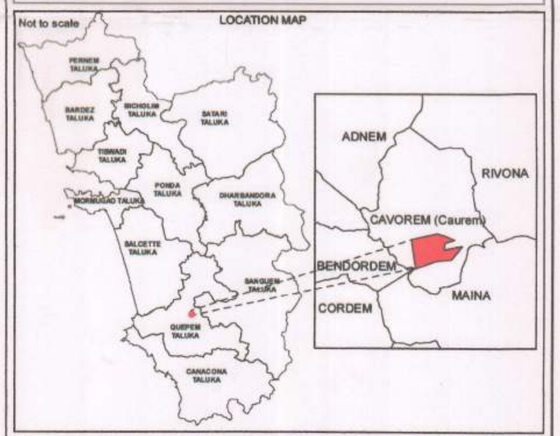
KEY PLAN

DATUM : WGS 84

PROJECTION : UTM Zone 43N

LOCATION MAP

Not to scale



CERTIFICATE

This is to certify that the lease boundary pillars of M.L. No. 3/Fe-Mn/79 granted to Late Shri Naraina Sinai Quirtonim have been surveyed using DGPS (Differential Global Positioning System) and is based upon the Total Station survey conducted earlier.

Mrs. Pradnya Z. P. Cano
(For self & on behalf of all other heirs of Late Shri Naraina Sinai Quirtonim as their duly constituted attorney)

Mr. K. M. Shivaprasad
(Surveyor)

CERTIFICATE

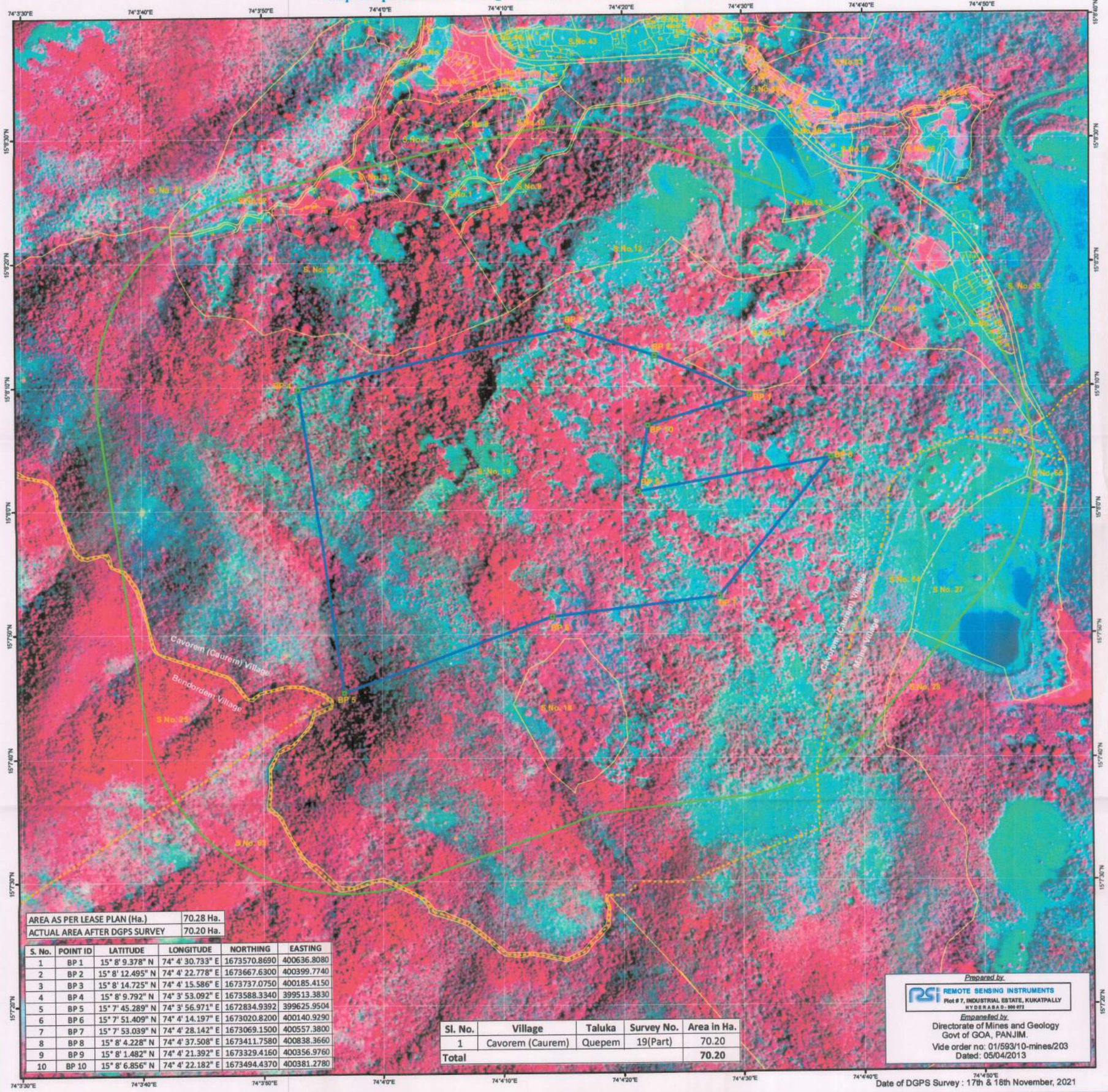
This is to certify that the boundary pillars as shown by Mr. K. M. Shivaprasad, (Surveyor) was surveyed by our team led by Mr. Subash Reddy, using DGPS (Differential Global Positioning System) instruments. The Lease map and pillar locations have been verified, survey conducted and plans prepared as per requirement of IBM circular No. 2/2010 dated 6-4-2010.

For Remote Sensing Instruments
Shri G.V.Ramana Kumar
(Chief Executive Officer)

Checked by	Certified by
Surveying Officer, Directorate of Mines & Geology, Government of Goa, Panaji - Goa	Director of Mines & Geology, Directorate of Mines & Geology, Government of Goa, Panaji - Goa.
Surveying officer	Director of Mines and Geology

PLATE No-10

Geo - Referenced Cadastral Map of "Zamblidadga Dongor Iron and Manganese Ore Mining Lease", bearing M.L. No. 3/Fe-Mn/79, granted to Late Shri Naraina Sinai Quirtonim situated in Cavorem (Caurem) Village of Quepem Taluka, South Goa District. Goa State, Superimposed on Latest High Resolution Cartosat - 2C MX Satellite Data



AREA AS PER LEASE PLAN (Ha.)	70.28 Ha.
ACTUAL AREA AFTER DGPS SURVEY	70.20 Ha.

S. No.	POINT ID	LATITUDE	LONGITUDE	NORTHING	EASTING
1	BP 1	15° 8' 9.378" N	74° 4' 30.733" E	1673570.8690	400636.8080
2	BP 2	15° 8' 12.495" N	74° 4' 22.778" E	1673667.6300	400399.7740
3	BP 3	15° 8' 14.725" N	74° 4' 15.586" E	1673737.0750	400185.4150
4	BP 4	15° 8' 9.792" N	74° 3' 53.092" E	1673588.3340	399513.3830
5	BP 5	15° 7' 45.289" N	74° 3' 56.971" E	1672834.9392	399625.9504
6	BP 6	15° 7' 51.409" N	74° 4' 14.197" E	1673020.8200	400140.9290
7	BP 7	15° 7' 53.039" N	74° 4' 28.142" E	1673069.1500	400557.3800
8	BP 8	15° 8' 4.228" N	74° 4' 37.508" E	1673411.7580	400838.3660
9	BP 9	15° 8' 1.482" N	74° 4' 21.392" E	1673329.4160	400356.9760
10	BP 10	15° 8' 6.856" N	74° 4' 22.182" E	1673494.4370	400381.2780

Sl. No.	Village	Taluka	Survey No.	Area in Ha.
1	Cavorem (Caurem)	Quepem	19(Part)	70.20
Total				70.20

Prepared by
REMOTE SENSING INSTRUMENTS
Plot # 7, INDUSTRIAL ESTATE, KUKATPALLY
HYDERABAD - 500 072
Empanelled by
Directorate of Mines and Geology
Govt of GOA, PANJIM.
Vide order no: 01/593/10-mines/203
Dated: 05/04/2013

Date of DGPS Survey : 17th & 18th November, 2021

N
W E
S

GOVT. OF INDIA-INDIAN BUREAU OF MINES

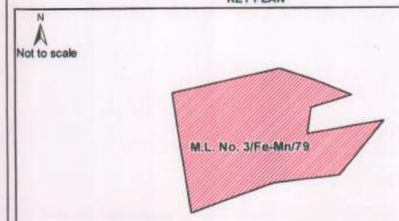
SCALE 1: 5000

0 50 100 200 300 400 500 Meters

Legend

- DGPS POINT OF LEASE BOUNDARY
- LEASE BOUNDARY AS PER DGPS SURVEY
- 500 METER BUFFER FROM LEASE BOUNDARY
- SURVEY No BOUNDARY
- SUB-DIVISION OF THE SURVEY No
- VILLAGE BOUNDARY

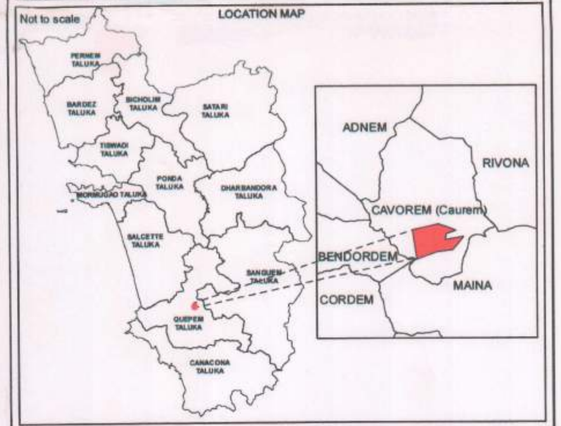
KEY PLAN



DATUM : WGS 84 PROJECTION : UTM Zone 43N

IMAGERY: Cartosat-2C MX DATE: 06-Mar-2021

LOCATION MAP



CERTIFICATE

This is to certify that the lease boundary pillars of M.L. No. 3/Fe-Mn/79 granted to Late Shri Naraina Sinai Quirtonim have been surveyed using DGPS (Differential Global Positioning System) and is based upon the Total Station survey conducted earlier.

Mrs. Pradnya Z. P. Cano
(For self & on behalf of all other heirs of Late Shri Naraina Sinai Quirtonim as their duly constituted attorney)

Mr. K. M. Shivaprasad
(Surveyor)

CERTIFICATE

This is to certify that the boundary pillars as shown by Mr. K. M. Shivaprasad, (Surveyor) was surveyed by our team led by Mr. Subash Reddy, using DGPS (Differential Global Positioning System) instruments. The Lease map and pillar locations have been verified, survey conducted and plans prepared as per requirement of IBM circular No. 2/2010 dated 6-4-2010.

For Remote Sensing Instruments
Shri. E.V Ramana Kumar
(Chief Executive Officer)

Directorate of Mines and Geology - Panaji - Goa

Checked by	Certified by
10/12/2021	
Surveying Officer, Directorate of Mines & Government of Goa, Panaji - Goa.	Director of Mines & Geology, Directorate of Mines & Geology Government of Goa, Panaji - Goa.
Surveying officer	Director of Mines and Geology

PLATE No. 10A

BENDODE VILLAGE

S 7

GW1

A 2

KAVARNE VILLAGE

RIVONA VILLAGE

S 4

S 3

N 2

KAVARNE VILLAGE

GW6

N 7

A 7

A 1

N 2

A 3

N 3

SHENSHORE VILLAGE

GW2

SW3

S 5

GW5

S 1

A 9(Proposed)

N 9 (Proposed)

S 2

A

N 6

GW5

Cavorem (Caurem) Village

Bendordem Village

Bendordem Village

Maina Village

Cavorem (Caurem) Village

Maina Village

SW1

A

S 6

N 4

MAINA VILLAGE

GW3

MAINA VILLAGE

SW2

SEASONAL NALLAH DOWNSTREAM

N 5

A 5

GW4

KHADDE VILLAGE

A 8

N 8

GW7

PIKLA VILLAGE

SW4

CAREA RIVER WATER

INDEX

	LEASE BOUNDARY		VILLAGE BOUNDARY
270	CONTOUR		500m BUFFER ZONE
	KACCHA ROAD		FIELDS
	VILLAGE ROAD		SETTLEMENTS
	OLD WORKING PIT		MINING AREA
	WASTE DUMP		EXISTING APPROACH ROAD TO MINE
	7.5m STATUTORY BARRIER		

SCALE :- 1: 5000

ENVIRONMENT MONITORING LOCATIONS

A1	AIR MONITORING LOCATIONS
SW2/GW1	WATER MONITORING LOCATIONS
S1	SOIL MONITORING LOCATIONS
N1	NOISE LEVEL MONITORING LOCATIONS

ZAMBLIDADGA DONGOR IRON AND MANGANESE ORE MINE

LESSEE: LATE SHRI NARAINA SINAI QUIRTONIM

M.L. NO. 03/FeMn/79, AREA:70.20 Ha

VILLAGE CAVOREM (CAUREM), TALUKA QUEPEM, DISTRICT: SOUTH GOA

PURPOSE OF THE PLAN: ENVIRONMENT PLAN

PLAN No.	DATE	SCALE	Certified that the Plan is prepared based on the lease map authenticated by the State Government and is correct to the best of my knowledge
DWG-6	01-01-2022	1 : 5000	Rohel Fernandes Qualified Person

PLATE No.11

Sl. No.	Particular	Area put to use at Start of Year (ha) (A)*	Additional Requirement (ha) (B)*	Total (ha) (C = A + B)
1	Area under Mining	2.2896	11.3135	13.6031
2	Topsoil stacking	--	--	--
3	Overburden/Waste Dumping	0.5746	12.6659	13.2405
4	Mineral Storage	--	--	--
5	Infrastructure (Workshop, Administrative Building etc.)	--	0.0531	0.0531
6	Roads	0.4702	-0.092	0.3782
7	Railways	--	--	--
8	Tailing Pond	--	--	--
9	Effluent Treatment Plant	--	--	--
10	Mineral Separation Plant	--	--	--
11	Township Area	--	--	--
12	Green Belt Area	3.1593	--	3.1593
13	Protective Measures	--	0.9016	0.9016
14	Unutilised Area	63.7063	--	38.8642
	Total	***70.2***	***24.8421***	***70.2***

INDEX

- LEASE BOUNDARY
- CONTOUR
- KACCHA ROAD
- OLD WORKING PIT
- WASTE DUMP
- BOREHOLE
- 7.5m STATUTORY BARRIER

LANDUSE INDEX

- AREA UNDER MINING
- WASTE DUMPING
- ROAD
- GREEN BELT AREA
- AREA REQUIRED FOR MINING
- AREA REQUIRED FOR DUMPING
- AREA REQUIRED FOR INFRASTRUCTURE
- AREA REQUIRED FOR PROTECTIVE MEASURES

SCALE - 1 : 2000

20 0 20 40 60 80 100 200 300 400 500

ZAMBLIDADGA DONGOR IRON AND MANGANESE ORE MINE

LESSEE: LATE SHRI NARAINA SINAI QUIRTONIM

M.L. NO. 03/FeMn/79, AREA:70.20 Ha

VILLAGE CAVOREM (CAUREM), TALUKA QUEPEM, DISTRICT: SOUTH GOA

PURPOSE OF THE PLAN: FINANCIAL AREA ASSURANCE PLAN

PLAN No.	DATE	SCALE
DWG-7	01-01-2022	1 : 2000

Certified that the Plan is prepared based on the lease map authenticated by the State Government and is correct to the best of my knowledge

(Roshal Fernandes)
Qualified Person

PLATE No.12