

By e-mail

**GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES
OFFICE OF THE REGIONAL CONTROLLER OF MINES, BHUBANESHWAR**

No. RMP-2303/2024-25-IBM_RO_BBS

Dt : 03/12/2024

Shri/M/s. THE ORISSA MINING CORPORATION LIMITED ,
A GOVT. OF ORISSA UNDERTAKING OMC HOUSE, UNIT-5, POST BOX NO.34 BHUBANESWAR

Sub Approval of the Mining Plan along with Progressive Mine Closure Plan (PMCP) in respect of Rengalbeda North East Block for Iron Ore
: over an area of 24.203 ha of M/s The Orissa Mining Corporation Ltd., situated in village Guali, Taluka Rugudi, Kendujhar District of Odisha State.

Sir,

In exercise of the powers conferred by clause (b) of sub-section (2) of section 5 of the Mines & Minerals (Development & Regulation) Act, 1957 and clause (3) of Rule 16 of the Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016 read with Government of India Order No. S.O. 1857(E) dated 18th May, 2016; I hereby **Approve** the Mining Plan along with Progressive Mine Closure Plan (PMCP) in respect of Rengalbeda North East Block for Iron Ore over an area of 24.203 ha of M/s The Orissa Mining Corporation Ltd., situated in village Guali, Taluka Rugudi, Kendujhar District of Odisha State. This approval is subject to the following conditions:-

- (1). The Mining Plan is approved without prejudice to any other law applicable to the mine area from time to time whether made by the Central Government, State Government or any other authority and without prejudice to any order or direction from any court of competent jurisdiction.
- (2). That this approval of aforesaid Mining Plan does not in any way imply the approval of the Government in terms of any other provision of Mines & Minerals (Development & Regulation) Act, 1957, or the Mineral Concession Rules, 2016 and any other laws including Forest (Conservation) Act, 1980, Environment (Protection) Act, 1986 or the rules made there under and other relevant statutes, order and guidelines as may be applicable to the lease area from time to time
- (3). The provisions of the Mines Act, 1952 and Rules and Regulations made thereunder including submission of notices of opening, appointment of manager and other statutory officials as required by the Mines Act, 1952 shall be complied with.
- (4). The execution of Mining Plan shall be subjected to vacations of prohibitory orders / notices, if any.
- (5). If anything is found to be concealed as required by the Mines Act in the contents of the mining plan and the proposal for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect.
- (6). This approval for proposed mining operations and associated activities is restricted to the mining lease area only from this date. The mining lease area is as shown on the statutory plans by the Lessee/QP/Applicant and Indian Bureau of Mines has not undertaken any survey verification of mining lease boundary on the ground.
- (7). Your attention is invited to the Supreme Court interim order in W.P. (C) No. 202 dated 12.12.1996 for compliance. The approval of above said Mining Plan is therefore, issued without prejudice to and is subject to the said directions of the Supreme Court as applicable.
- (8). This department does not undertake any responsibility regarding correctness of the boundaries of the lease area shown on the ground.
- (9). 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). If this approval conflicts with any other law or court order/ Direction under any statute, it shall be revoked immediately.
- (11). It shall be mandatory for the project proponent, abstracting ground water, to obtain "No Objection Certificate" from Central Ground Water Authority or, the concerned State/Union Territory Ground Water Authority, as the case may be.
- (12). Lessee shall ensure grassing/re-grassing of worked out mining lease area in accordance with Hon'ble Supreme Court Order dated 08/01/2020.

(13). Validity of excavation proposal of this document shall expire within 5 (five) financial year from execution of the mining lease.

(14). The next Review of Mining Plan for the subsequent period of five years shall become due 180 days before expiry of this document proposal period.

(15). Copy of the all Statutory Clearances such as Environment Clearances (EC), Forest Clearances (FC) and Lease deed shall be submitted in this office before commencement of mining operation.

(16). This approval of the Mining Plan is subject to the condition that the lessee should submit Financial Assurance in form of bank guarantee as per statute to this office before commencement of mining operation of the mining block under reference.

(17). The feasibility report considered for reserve/resource estimation as per UNFC is submitted by the preferred bidder / lessee which is prepared based on the current data as reported and it may not establishes the future economic viability of mining project, which may be affected by the market dynamics and other related factors.

(18). Disposal of OB/Waste as minor mineral shall be carried out only after obtaining permission under Rule 12(1)(k) of Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016.

Yours Faithfully

(Arun Kumar)

Regional Controller of Mines,

Copy for information to :-

(1). The Controller of Mines (EZ), Indian Bureau of Mines, Kolkata- 700 091 by mail. zo.kol@ibm.gov.in

(2). The Director of Mines, Directorate of Mines, Government of Odisha, Email- directoratofmines@orissaminerals.gov.in.

(4). Qualified Person by mail- sprusty@odishamining.in

Chapter 1 : General Information

1.1 : Lease Details

IBM Registration Number :	IBM/4269/2011
Lease Code :	PB150
Mine Code :	Nil
Name of Lessee :	THE ORISSA MINING CORPORATION LIMITED
Address of Lessee :	A GOVT. OF ORISSA UNDERTAKING OMC HOUSE, UNIT-5, POST BOX NO.34 BHUBANESWAR
Type of Lessee :	PSU
Name of Mining Lease :	Rengalbeda North East Iron Ore Block
State :	ODISHA
District :	KENDUJHAR
Tehsil/ Taluk/ Mandal :	Rugudi
Village :	Guali
Lease Area (Ha) :	24.203
Forest Area (Ha) :	24.2030
Name of Minerals :	IRON ORE

Name of associated minerals :	
Type :	Fresh Grant
Period of the proposal (FY) from :	Nil
Period of the proposal (FY) to :	Nil
Type of working :	Opencast
Nature of Use :	Non Captive
Category of Mine :	Category A

1.1.1 : Initial/subsequent Lease grant details

Grant	From	To	Lease deed execution date	Lease registration date
Nil	Nil	Nil	Nil	Nil

1.1.2 : Mining Plan Submission Criteria Details

Type of Document :	Mining Plan Under Rule 16(1) Of MCR 2016
LOI Number :	12897-SM-MC1-MISC-0035-2020/SM Bhubaneswar
Date :	26/12/2023

1.2 : Land Ownership Details

View Land Ownership Details Excel	Land_Ownership_Details (1).xlsx
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1.3 : Existing Lease

Date of Execution :	Nil
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1.3.1 : Approval of earlier Mining Plan & Its Subsequent Review in Chronological Order

S.N.	Letter Number	Date	Period		Type Of Approved Document	Remark
			From	To		
1	NA	Nil	Nil	Nil	Nil	Not Applicable

1.3.2 : Partial Surrenderd Area During Stages of Operations in Chronological Order

Not Applicable

1.3.3 : Transfer of Lease Area Subsequent to Grant

Not Applicable

1.3.4 : Statutory Compliances

1.3.4.1 : Environment Clearance

Applicable :	No
Letter No :	Nil
Date :	Nil
Validity :	Nil

ROM Mineral :	Nil
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1.3.4.2 : SPCB Approvals

Letter No :	Nil
Approval of :	Nil
Date :	Nil
Validity :	Nil
ROM Mineral :	Nil

1.3.4.3 : Forest Clearance

Applicable :	No
Letter No :	Nil
Date :	Nil
Validity :	Nil
Area (Ha) :	Nil

1.3.4.4 : Land Acquisition Details

Total Area Acquired in hectare:	0.0000
Total Amount Paid (INR) :	0.0000

1.3.5 : Mine Location Details

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Toposheet Number :	F45H4,F45H8,F45N1,F45N5
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1.3.5.1 : Location of Boundary Pillars

View Location of Boundary Pillars Excel	location_boundary_pillar.xlsx
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1.3.6 : Owner/Nominated Owner Details

Name	PAN of owner / Nominated Owner	Address of owner/ Nominated Owner	Mobile / Contact Number	Email	Please attach Minutes of Board Resolution in case of Nominated Owner
Balwant Singh IAS	BFMPS6439D	A GOVT OF ORISSA UNDERTAKINGOMC HOUSE UNIT5 POST BOX NO34BHUBANESWAR	0674-2392778	md@odishamining.inm	Nominated_Owner.pdf

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

S.N.	Prefix	Name	PAN of QP	Address	Mobile no.	Qualification	Exp in years as prescribed under the rule	Email
1	Mr	Saroj Kumar Prusty	BABPP7275G	OMC HOUSE,POST BOX NO-34,BHU BANESWAR ODISHA-751001	6372584041	1ST CLASS MANAGER CERTIFICATE BE IN MINING ENGINEERING	15	sprusty@odishamin ing.in
2	Mrs	RITANJALI BEHERA	AQOPB9669A	OMC HOUSE,POST BOX NO-34,BHU BANESWAR ODISHA-751001	9438667236	MSC GEOLOGY	10	ritanjali.behera@od ishamining.in

Approved

Chapter 2A : Geology & Exploration

2A.1 : Geology

2A.1.1 : Topography

Terrain :	Undulating
Highest Level (m) from MSL :	594.0000
Lowest Level (m) from MSL :	548.0000
Average Level (m) from MSL :	571.0000
Drainage Pattern :	Dendritic
Order of Stream :	Order 1
Min Dist of Stream from Lease Area(m) :	2.0000

2A.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	River (85:16:05.56E, 21:58:37.85N)	1.3 KM	At a distance of 1.3 km, Karo river is flowing in the northern part of the lease boundary from west to east direction.
Public roads (Tar road, cart road)	Road (85:16:22.52E to 85:16:22.52E & 21:58:02.68N to 21:58:02.68N)	0	NH-520 is passes through the lease area. Mining operation will be strictly adherence from 50m distance of the NH-520.
Railway track	Nil	Nil	Nil
Human settlements	Nuagaon (85:16:19.92E ,	Nuagaon:0km ,Gandhalpada:0km,	Rehabilitation work under process. The mining

	21:58:17.63N),Gandhalpada (85:16:45.40E, 21:58:04.13N), Guali(85:18:32.20E, 21:59:14.84N),Panduliposi (85:16:31.07E, 21:58:50.60N), and Kendudihi (85:16:12.88E, 21:59:39.16N)	Guali:4.5km,Panduliposi:1.65 and Kendudihi:3.1km	operation shall presume after completion of Rehabilitation and Resettlement.
Archaeological monuments/ places of worships/public utilities etc	Nil	Nil	Nil
Wild life sanctuaries/ national parks	Nil	Nil	Nil
Coastal Regulation Zone (CRZ)	Nil	Nil	Nil
Powertransmision lines/telephone lines	High Transmission line (85:16:12.42E to 85:16:22.75E & 21:57:52.64N to 21:58:09.11N)	0	Power transmission line NOC obtained from the concerned competent authority and enclosed as Annexure20. The same will be relocated or shifted outside of the lease boundary.
Firing range	Nil	Nil	Nil
Ordinance factory	Nil	Nil	Nil
grazing land/ burial ground or cremation ground	Nil	Nil	Nil
Any other specify	Nil	Nil	Nil

Particulars	Distance from lease boundary in kms
Near by village	Nuagaon:0km ,Gandhalpada:0km, Guali:4.5km,Panduliposi:1.65 and Kendudihi:3.1km
Nearest Railway station	Banspani station 25km from lease area
Nearest Port	Pradeep port
Distance of SH/NH from lease area	NH-215 is passes through the lease area.

2A.1.3 : Regional Geology

Regional Geology

The Singhbhum-Odisha Craton in Eastern India consists of diverse geological terrains with distinct evolutionary histories. This is one of the oldest Palaeo-Mesoarchaeancratonic nuclei of the peninsular India. The present study area is a part of the Bonai-Kendujhar belt of Sundargarh and Kendujhar District. The feebly metamorphosed Precambrian volcano- sedimentary rocks exposed in this belt between the Singhbhum granite on the east and Bonai granite on the west are classified as “Iron ore Group” (Sarkar & Saha, 1963) or “Koirā Group” (Murthy and Acharya, 1975). These rocks are disposed in the form of a low northerly plunging “Horse-shoe” shaped synclinorium (Jones, 1934). Regional Stratigraphy: The regional stratigraphy of the area modified after Murthy and Acharya is given below: Kolhan Group unconformity..... Upper Shale Formation Banded Iron Formation 3.1-3.3 Ga Lower Shale Formation Volcanic Formation (3.3 Ga) Basal sandstone – Quartziteunconformity..... Singhbhum & Bonai Granites And metamorphosed sediments The base of the Koirā Group is marked by a pronounced unconformity over the Singhbhum granite in the eastern side and has a sheared inter-fingering contact relationship with Bonai granite on the western side. The basal formation comprises of gritty sandstone, which ranges from orthoquartzite on one hand to pebbly sandstone and conglomerate on the other. This arenaceous unit is followed by mafic volcanics which is found all along the outer periphery of the horse-shoe synclinorium. The volcanic formation comprises predominantly of Lower volcanic flows dominantly of mafic composition and an upper tuffaceous zone. The lava is pillowed at the bottom part and amygdaloidal at the top indicating its sub-aqueous and subsequent sub-aerial character. The lava grades into purple colour tuffaceous shale conformably towards the upper part and described as “Lower Shale Formation” .

2A.1.4 : Local Geology & Structure

2A.1.4.1 : Local Geological Set-up

Iron ore in Rengalbeda (NE) Iron Ore Block occurs as isolated bodies in the synclinal valley. It is associated and intercalated with cream, buff, purple coloured variegated shale, ferruginous shale and BHQ/ BHJ/ BHC and chert bands. The iron ore is capped by laterite and ferruginous laterite on surface. The Local stratigraphic succession as worked out in the study area tentatively belongs to Upper Shale Formation of Murthy & Acharya (1975) and is given as below: Group/ Formation Lithology Recent Soil/ Alluvium Cover Cenozoic Laterite (Fe-Laterite) Upper Shale Formation Ferruginous Shale Unit: Shale of different coloration like pink, cream and yellow, variegated with inter beds of Iron ore. Iron Ore Unit: Powdery ore, Soft Laminated Ore (SLO) and Hard Laminated Ore/ Lateritised Hard Laminated Ore with shale intercalation Shale (mainly yellowish limonitized variegated/ cherty/ tuffaceous Shale) BIF Formation: BIF (BHJ/BHQ/BHC and Chert), Coarsely banded jaspillite followed up by finely banded jaspillite.

2A.1.4.2 : Structure

The primary sedimentary structures are prominent in the BHJ and BHQ, which includes banding, bedding, linear markings etc. The laminated ore body mostly shows banding and folds similar to the underlying BHJ and BHQ. Bedding is the prominent structure with B.I.F, as well as in the litho members of Upper shale sequence in this area and is characterized by color banding as well as compositional banding (in BHJ). In the present area, at least 2 phases of deformation is observed in laminated ore. The iron ore body, which belongs to a part of regional near dome-basin structure, exposed in the form of hard laminated ore and lateritic ore with a strike of NE-SW direction. Ore body is exposed in Rengalbeda (NE) Iron Ore Block for a maximum strike length of 350 m. and across the strike the ore body is exposed on the surface for around 700 m in width and it can be traced further towards north. The ore body strikes along N600E-S600W with dip varying from gentle to steep towards south.

2A.1.4.3 : Lithology, Petrographic & Mineralogical Description for Major, Associated & Indicator Minerals

BIF: In the mapped area, the BIF is represented by iron ore and Fe-shale. No surficial exposure of BHQ/BHJ/BHC is observed in the area. However, these units are abundant in the drill cores

representing mainly the footwall rocks. The Banded Iron Formation intersected in the drill cores is represented by BHJ/ BHQ/ BHC, inter-bedded black or green shale and banded ferruginous chert. The BHJ/BHQ represents an important marker horizon. Ferruginous Shale: It occurs in the southern part of the block and represented by a finely laminated rock having varied shades of colour ranging from white, maroon, dark gray, brownish and purple to green etc. Iron ore: The thinly laminated, hematitic ore bodies exposed in the entire ridge area are very often lateritised near the surface. However, in situ bouldery outcrops of hard and soft laminated, massive ores are found at the identified blocks where exploration is being carried out at present. The iron ore body is exposed discontinuously (hard laminated ore, lateritic ore) trending in NE-SW direction. Laterite: Intermittent western flat ridge part and consistent eastern fringe part of the DM area is covered by laterite of various types. The laterites have been developed mostly over the shale unit of the area and depending upon the composition of the shale, different types of laterites have been developed. Alluvial soil:The low lying areas, valleys and nala are filled up with alluvial soil. It is ferruginous in nature and reddish brown in colour in most part of the covered area. Grey to light brown coloured soil is observed over the cultivable land. In most of the area, the soil is moderately coarse in nature whereas it is loamy in the cultivation land.

2A.1.4.4 : Mode of Occurance & Controls of Mineralization

Iron ore in Rengalabeda North-East Block occurs as isolated bodies in the synclinal valley. It is associated and intercalated with cream, buff, purple coloured variegated shale, ferruginous shale and BHQ/ BHJ/ BHC and chert bands. The iron ore is capped by laterite and ferruginous laterite on surface. Structurally it is controlled by the disposition is mainly depicted by pinch and swell structure both along and across the strike due to superposition of F2 and F3 folding, which has led to elongated dome and basin structure and thus controls the iron ore deposits in this belt. The ore zone has become void or very thin along the valley part in the block probably due to pinching out of or thinning out of the ore zone along the dip as evident from the respective boreholes in the valley part.

2A.1.4.5 : Extent of Weathering/ Alteration

Specific process of alteration subject to enrichment of iron ore from its protore Banded Iron Formation (BIF) is still a question of debate. However, it is well accepted phenomenon that the concentration of iron ore is an effect of leaching out of silica due to the supergene enrichment under favourable Eh-pH condition. Recent study also reveals that upgradation of BIF to high-grade (>65% Fe) iron ore (Hageman et al, 2007) is a composite process of structurally controlled hydrothermal fluid flow thus resulting in hypogene alteration.

2A.1.4.6 : Nature/Form of Mineral	Lump
Specify If any other	Fines, (Lumps & Fines ratio:- 13:87)

2A.1.4.7 : Extent of Mineralization

The ore is mostly powdery to soft laminated varieties (FINES) with partings of ferruginous shale as intersected in almost all the boreholes. Hard Laminated ore (HLO) (LUMPS) is present on the surface, which is partly lateritized, followed by powdery and soft laminated ore at depth, which are inseparable during dry drilling in most of the cases. However, an attempt has been made to demarcate the HLO horizon separately and resource of HLO has also been calculated in case of considerable thick distinct HLO horizon wherever intersected. It is to mention here that 13.30 m, 9.00m, 13.00 m, 29.60 m, 16.00 m, 10.10 m,8.05 m, 19.00 m and 19.00 m thick of cumulative hard laminated ore has been intersected at 28.0 mbgl, 10.0 mbgl, 25.0 mbgl, 2.0 mbgl, 0.0 mbgl, 17.90mbgl, 34.0 mbgl, 8.0 m mbgl and 0.0 mbgl (metre below ground level) in borehole OKR-1, OKR-2, OKR-3, OKR-4, OKR-8, OKR-11, OKR-12, OKR-14 and OKR-22 respectively. But, numerous thin bands of hard laminated ore (2 m thick) occasionally occuring along with the powdery and soft laminated ore are ignored while calculating the resource. The HLO is partly or

extensively lateritized on the surface as well as near or below the surface up to 20 m, while occasionally altered and brecciated at a great depth. It may be noted here that except the HLO zone mentioned above and discussed or plotted in the cross sections, plenty of low grade or marginally low grade HLO zone is also intersected in various boreholes, which is not considered under the HLO category due to their low grade and less specific gravity. Mineralogically, the ore is mainly hematite but limonite and goethite also occur at places.

2A.1.4.8 : Deposit Type (as per MEMC Rule)						
As per MEMC Rule2015, the Rengalbeda North East Iron ore Block belongs to bedded Stratiform and tabular deposits of irregular habit.						

Strike / Trend of the Ore Body						
N	60	E	to	S	60	W

Amount of Dip of the Ore Body (degree)			Amount of Dip of the Ore Body (degree)			
20			40			
(from)			(to)			

Dip Direction of the Ore Body			Plunge of Mineral Body (degree) (if any)	Direction of Plunge		
N	45	W	0	W	0	W

2A.2: Exploration

2A.2.1: Summary of The Previous Exploration (for fresh grant) / During Last Plan Period (for existing leases)

Name of The Agency
Geological Survey of India(GSI)

2A.2.1.1: Geological Mapping

SI.No.	Year		Scale	Area Covered (Ha)
	From	To		

1	03/05/2016	25/04/2017	1:2000	24.2030
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2A.2.1.2: Airborne Geophysical Survey

SI.No.	Type of Survey	Spacing (m)	Total line (km)	Area Covered (Ha)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
					Form	To	Form	To
1	NIL	Nil	Nil	Nil	Nil	Nil	Nil	

2A.2.1.3: Ground Geophysical Survey

Sl.No.	Type of Survey	Spacing (m)	Total line (km)	Area Covered (Ha)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
					Form	To	Form	To
1	Nil	Nil	Nil	Nil	Nil	Nil	Nil	

2A.2.1.4: Geochemical Survey

SI.No.	Type of Sample	No of Samples	Aanlysis report	Area Covered (Ha)
1	Nil	Nil	Nil	Nil

2A.2.1.5: Pitting

Number of Pits
8

[illegible]

2	01/01/2017	31/01/2017	OKR/PTS/2017/1/2	4.60	4.50	2.00	1.00	2.00	1.00	SoilAlluvium	Fe	31.64	21:58:02.62	21:58:02.77	85:16:22.62	85:16:22.78
3	01/02/2017	28/02/2017	OKR/PTS/2017/2	4.60	4.50	1.00	0.00	1.00	1.00	Lateritic Ore Fragmentary Ore	Fe	37.52	21:58:01.52	21:58:01.67	85:16:21.62	85:16:21.78
4	01/03/2017	31/03/2017	OKR/PTS/2017/3	4.60	4.50	1.00	0.00	1.00	1.00	Fragmentary Ore	Fe	45.16	21:58:00.22	21:58:00.37	85:16:21.22	85:16:21.38
5	01/04/2017	30/04/2017	OKR/PTS/2017/4	4.60	4.50	1.00	0.00	1.00	1.00	Fragmentary Ore	Fe	52.02	21:58:04.32	21:58:04.47	85:16:13.02	85:16:13.18
6	01/05/2017	31/05/2017	OKR/PTS/2017/5	4.60	4.50	1.00	0.00	1.00	1.00	SoilAlluvium	Fe	45.57	21:58:05.52	21:58:05.67	85:16:14.32	85:16:14.48
7	01/06/2017	30/06/2017	OKR/PTS/2017/6	4.60	4.50	1.00	0.00	1.00	1.00	SoilAlluvium	Fe	51.17	21:58:06.52	21:58:06.67	85:16:10.92	85:16:11.08
8	01/07/2017	31/07/2017	OKR/PTS/2017/7	4.60	4.50	1.00	0.00	1.00	1.00	SoilAlluvium	Fe	48.88	21:58:02.52	21:58:02.67	85:16:08.42	85:16:08.58
9	01/08/2017	31/08/2017	OKR/PTS/2017/8/1	4.60	4.50	1.00	0.00	1.00	1.00	SoilAlluvium	Fe	22.96	21:57:53.82	21:57:53.97	85:16:11.02	85:16:11.18
10	01/08/2017	31/08/2017	OKR/PTS/2017/8/2	4.60	4.50	2.00	1.00	2.00	1.00	SoilAlluvium	Fe	26.04	21:57:53.82	21:57:53.97	85:16:11.02	85:16:11.18

2A.2.1.6: Trenching

Number of Trenches
0

2A.2.1.6.1: Spacing

Min (m)	Max (m)	Avg (m)
0.00	0.00	0.00

SI.No.	Year		Trench ID	Length of Trench (m)	Width of Trench (m)	Depth of Trench(m)	Depth (from)	Depth(to)	Running mtr	Litho units exposed	Name of the radical	Av. Grade	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
	From	To											From	To	From	To
1	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

2A.2.1.7 Exploratory Drilling(Core/non Core)

SI.No.	Year		Exploration agency	Core holes		Non-core (RC/DTH)		Grand total		Attach log sheet of each borehole in csv/excel format
	From	To		Number of boreholes drilled	Total mtrs	Number of boreholes drilled	Total mtrs	Number of boreholes drilled	Total mtrs	
1	03/05/2016	25/04/2017	Geological Survey of India	22	2071.15	0	0.00	22	2071.15	DETAILED LI THOLOG.xls

2A.2.1.8: Exploratory Mining

SI.No.	Pit/Adit ID	Length in Mtr	Width in Mtr	Depth in mtrs	Volume (m³)
1	Nil	0.00	0.00	0.00	0.00

2A.2.1.9: Sampling

SI.No.	Type of sample	No of samples collected	Number of samples analyzed	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)		Remark if any
				From	To	From	To	
1	Drill Core	95	95	21:58:02.23	Nil	Nil	85:16:19.06	OKR-01
2	Drill Core	73	73	21:57:57.03	Nil	Nil	85:16:10.16	OKR-02
3	Drill Core	94	94	21:58:00.52	Nil	Nil	85:16:16.13	OKR-03
4	Drill Core	126	126	21:57:58.77	Nil	Nil	85:16:13.14	OKR-04
5	Drill Core	88	88	21:57:51.83	Nil	Nil	85:16:13.79	OKR-05
6	Drill Core	63	63	21:57:54.32	Nil	Nil	85:16:12.06	OKR-06

7	Drill Core	28	28	21:57:59.70	Nil	Nil	85:16:08.30	OKR-07
8	Drill Core	24	24	21:58:02.44	Nil	Nil	85:16:06.38	OKR-08
9	Drill Core	63	63	21:57:53.34	Nil	Nil	85:16:16.93	OKR-09
10	Drill Core	79	79	21:57:56.05	Nil	Nil	85:16:15.03	OKR-10
11	Drill Core	69	69	21:58:01.45	Nil	Nil	85:16:11.27	OKR-11
12	Drill Core	82	82	21:58:04.18	Nil	Nil	85:16:09.37	OKR-12
13	Drill Core	69	69	21:57:57.80	Nil	Nil	85:16:18.04	OKR-14
14	Drill Core	118	118	21:58:03.18	Nil	Nil	85:16:14.27	OKR-15
15	Drill Core	56	56	21:57:59.51	Nil	Nil	85:16:20.97	OKR-17
16	Drill Core	91	91	21:58:04.88	Nil	Nil	85:16:17.19	OKR-18
17	Drill Core	55	55	21:58:03.98	Nil	Nil	85:16:22.05	OKR-20
18	Drill Core	45	45	21:58:06.63	Nil	Nil	85:16:20.19	OKR-21
19	Drill Core	83	83	21:58:05.91	Nil	Nil	85:16:12.35	OKR-22

2A.2.1.10: Chemical Analysis

SI.No.	Sample ID	Minerals	Radical with garde in %	Name of Agency	Type of agency	Attachment
1	OKR-01/1 to 96.85	Iron	Fe: 19.92 to 61.95 Mn:0.01 to 0.05 Sio2:3.56 to 58.91 Al2O3:1.03 to 4.24 Na2O:0.01 to 0.02 K2O:0.01 to <0.01 LOI:1.26 to 15.84	Geological Survey of India	NABL accredited	Collar.xls
2	OKR-02/1 to 73.10	Iron	Fe: 42.83 to 65.95 Mn: 0.01 to 0.05 Sio2: 1.24 to 19.32 Al2O3:0.77 to 3.36 Na2O:0 K2O:0 COI:1.59 to 9.97	Geological Survey of India	NABL accredited	Survey.xls
3	OKR-03/1 to 99.45	Iron	Fe: 42.98 to 65.03 Mn:0.01 to 0.05 Sio2:1.96 to 32.04 Al2O3:0.01 to	Geological Survey of India	NABL accredited	Assay.xls

			5.06 Na ₂ O:0 K ₂ O:0 LOI:1.37 to 15.61			
4	OKR-04/1 to 125.6	Iron	Fe: 43.26 to 65.52 Mn:0.01 to 0.05 SiO ₂ :1.16 to 25.48 Al ₂ O ₃ :0.95 to 8.51 Na ₂ O:0 K ₂ O:0 LOI:1.34 to 11.04	Geological Survey of India	NABL accredited	Geology.xls
5	OKR-05/1 to 88.0	Iron	Fe: 47.67 to 65.45 Mn:0.01 to 0.05 SiO ₂ :2.26 to 24.76 Al ₂ O ₃ :0.01 to 4.17 Na ₂ O:0 K ₂ O:0 LOI:1.59 to 8.48	Geological Survey of India	NABL accredited	Nil
6	OKR-06/1 to 80.45	Iron	Fe: 42.07 to 65.11 Mn:0.01 to 0.04 SiO ₂ :2.52 to 20.16 Al ₂ O ₃ :1.05 to 9.45 Na ₂ O:0 K ₂ O:0 LOI:2.09 to 9.93	Geological Survey of India	NABL accredited	Nil
7	OKR-07/15.35 to 43.0	Iron	Fe: 56.05 to 66.66 Mn:0.04 to 0.08 SiO ₂ :1.32 to 8.76 Al ₂ O ₃ :0.75 to 4.44 Na ₂ O:0.01 to 0.08 K ₂ O:0.01 to 0.03 LOI:0	Geological Survey of India	NABL accredited	Nil
8	OKR-08/1 to 25.0	Iron	Fe: 44.58 to 67.21 Mn:0.01 to 0.09 SiO ₂ :0.13 to 14.40 Al ₂ O ₃ :0.56 to 10.80 Na ₂ O:0.01 to 0.02 K ₂ O:0.01 to 0.04 LOI:0	Geological Survey of India	NABL accredited	Nil
9	OKR-09/1 to 63.10	Iron	Fe: 36.72 to 63.63 Mn:0.01 to 0.16 SiO ₂ :4.52 to 48.10 Al ₂ O ₃ :6.14 to 3.91 Na ₂ O:0 K ₂ O:0 LOI:1.38 to 6.28	Geological Survey of India	NABL accredited	Nil
10	OKR-10/1 to 79.20	Iron	Fe: 29.19 to 64.68 Mn:0.01 to 0.04 SiO ₂ :2.28 to 49.92 Al ₂ O ₃ :1.29 to 7.35 Na ₂ O:0 K ₂ O:0 LOI:1.74 to 7.02	Geological Survey of India	NABL accredited	Nil

11	OKR-11/1 to 91.90	Iron	Fe: 42.15 to 65.72 Mn:0.01 to 0.03 SiO ₂ :1.38 to 27.42 Al ₂ O ₃ :0.82 to 9.05 Na ₂ O:0 K ₂ O:0 LOI:1.84 to 13.78	Geological Survey of India	NABL accredited	Nil
12	OKR-12/1 to 96.00	Iron	Fe: 29.29 to 68.50 Mn:0.01 to 0.26 SiO ₂ :0.16 to 24.98 Al ₂ O ₃ :0.39 to 21.5 Na ₂ O:0.01 to 0.02 K ₂ O:0.01 to 0.03 LOI:5.84 to 14.55	Geological Survey of India	NABL accredited	Nil
13	OKR-14/1 to 69.2	Iron	Fe: 36.61 to 64.34 Mn:0.01 to 0.04 SiO ₂ :2.34 to 28.20 Al ₂ O ₃ :0.25 to 9.91 Na ₂ O:0 K ₂ O:0 LOI:0.87 to 13.73	Geological Survey of India	NABL accredited	Nil
14	OKR-15/1 to 124.00	Iron	Fe: 36.55 to 67.15 Mn:0.01 to 0.04 SiO ₂ :0.64 to 43.37 Al ₂ O ₃ :0.25 to 14.30 Na ₂ O:0 K ₂ O:0 LOI:1.48 to 15.53	Geological Survey of India	NABL accredited	Nil
15	OKR-17/1.65 to 65.20	Iron	Fe: 36.33 to 62.23 Mn:0.01 to 0.05 SiO ₂ :6.08 to 39.42 Al ₂ O ₃ :1.35 to 9.59 Na ₂ O:0.01 to 0.03 K ₂ O:0.01 to 0.02 LOI:2.05 to 11.97	Geological Survey of India	NABL accredited	Nil
16	OKR-18/19.20 to 112.75	Iron	Fe: 39.69 to 64.89 Mn:0.01 to 0.04 SiO ₂ :2.02 to 35.16 Al ₂ O ₃ :0.01 to 11.08 Na ₂ O:0 K ₂ O:0 LOI:2.24 to 12.87	Geological Survey of India	NABL accredited	Nil
17	OKR-20/21 to 85.50	Iron	Fe: 30.38 to 57.61 Mn:0.01 to 0.04 SiO ₂ :11.76 to 48.64 Al ₂ O ₃ :2.13 to 8.11 Na ₂ O:0.01 to 0.03	Geological Survey of India	NABL accredited	Nil

			K ₂ O:0.01 to 0.02 LOI:1.29 to 10.44			
18	OKR-21/53 to 98.00	Iron	Fe: 45.29 to 64.19 Mn:0.01 to 0.04 SiO ₂ :2.98 to 21.32 Al ₂ O ₃ :1.05 to 4.29 Na ₂ O:0 K ₂ O:0 LOI:2.75 to 10.10	Geological Survey of India	NABL accredited	Nil
19	OKR-22/1 to 83.00	Iron	Fe: 29.54 to 65.24 Mn:0.01 to 0.04 SiO ₂ :2.04 to 47.22 Al ₂ O ₃ :1.03 to 3.89 Na ₂ O:0 K ₂ O:0 LOI:2.01 to 11.12	Geological Survey of India	NABL accredited	Nil

* Chemical analysis of core /non vore samples may be uploaded in CSV file which shall normally include Five files namely collar file, survey file and Geology log file, Assay file & RQD File.

2A.2.1.11: Petrology & Mineralogical Studies

SI.No.	Type of Sample	Number of Sample Drawn	Number of Sample Analyzed	Petrographic Study Report
1	Mineral	10	10	Petrographic study Rengalbeda compressed (1).pdf
2	Waste	2	0	Nil

2A.2.1.12: Beneficiation Studies

SI.No.	Type of Beneficiation	Number of Samples	Attach
1	Others	15	Ore beneficiation study Rengalbeda compressed-compressed.pdf
2	Others	1	Nil

2A.2.1.13: Bulk Density Study as per M(EMC) Rules, 2015 and SOP of CGPB

Method adopted for calculating bulk density of ore and waste
Bulk Density study has been carried out by Geological Survey of India, a Govt. Laboratory through block sampling method.

Sl.No.	Nature of Ore/OB	Mineral	Number of samples	Bulk Density Established (t/m ³)
1	Hard Laminated Ore HLO Lumps	Iron ore	1	3.50
2	Soft Laminated Ore SLO Powdery Iron ore Rengalbeda North East Iron ore Block PB Final Submitted Ore	Iron ore	1	2.70
3	Lateritic Iron Ore Goethitic Ore Iron ore with shale	Iron ore	1	2.50

2A.2.1.14: Area Covered under Exploration

Level of exploration	Area in Ha.		Total Area in Ha.
	Forest	Non Forest	
G-1	0.000000	0.000000	0.000000
G-2	24.203000	0.000000	24.203000
G-3	0.000000	0.000000	0.000000
G-4	0.000000	0.000000	0.000000
Area proved as Non-mineralized	5.010000	0.000000	5.010000
Area to be explored	19.193000	0.000000	19.193000
Total	24.203000	0.000000	24.203000

2A.2.2: Summary of The Previous Exploration (Before Last Plan Period)

Name of The Agency
NIL

2A.2.2.1: Geological Mapping

Sl.No.	Year		Scale	Area Covered (Ha)
	From	To		

1	Nil	Nil	Nil	Nil
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2A.2.2.2: Airborne Geophysical Survey

SI.No.	Type of Survey	Spacing (m)	Total line (km)	Area Covered (Ha)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
					From	To	From	To
1	NIL	0.00	0.000000	0.00	Nil	Nil	Nil	Nil

2A.2.2.3: Ground Geophysical Survey

SI.No.	Type of Survey	Spacing (m)	Total line (km)	Area Covered (Ha)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
					From	To	From	To
1	NIL	Nil	Nil	Nil	Nil	Nil	Nil	Nil

2A.2.2.4: Geochemical Survey

SI.No.	Type of Sample	No of Samples
1	Nil	Nil

2A.2.2.5: Pitting

SI.No.	Pit ID	Length of Pit (m)	Width of Pit (m)	Depth of Pit (m)	Litho units exposed	Litho Unit From (m)	Litho Unit To (m)	Average Grade(%)	Running Metres (m)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
										Form	To	Form	To
1	Nil	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	Nil	Nil	Nil	Nil

2A.2.2.6: Trenching

Number of Trenches
0

Spacing

Min (m)	Max (m)	Avg (m)
0.00	0.00	0.00

Area Covered Under Trenching

Co-ordinates

Latitude

North	Nil
North	Nil
North	Nil
North	Nil

Longitude

East	Nil
East	Nil
East	Nil
East	Nil

SI.No.	Trench ID	Length of Trench (m)	Width of Trench (m)	Depth of Trench (m)	Litho Units Exposed	Average Grade	Running mtr	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
								From	To	From	To
1	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

2A.2.2.7: Exploratory Drilling

2A.2.2.7.1:Core/Non-core Drilling

SI.No.	Year		Exploration agency	Core holes		Non-core (RC/DTH)		Grand total		Attach log sheet of each borehole in csv/excel format
	From	To		Number of boreholes drilled	Total mtrs	Number of boreholes drilled	Total mtrs	Total boreholes	Total mtrs	
1	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

2A.2.2.8: Exploratory Mining

SI.No.	Pit / Adit ID	Volume (m³)
1	Nil	Nil

2A.2.2.9: Sampling

SI.No.	Type of sample	Number of Samples	Area Covered (Ha)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
				From	To	From	To
1	Nil	Nil	Nil	Nil	Nil	Nil	Nil

2A.2.2.10: Chemical Analysis

SI.No.	Sample ID	Minerals	Radical Analysis	Attachment
1	Nil	Nil	Nil	Nil

2A.2.2.11:Petrology & Mineralogical Studies

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

2A.2.2.12: Beneficiation Test

SI.No.	Type of Beneficiation	Number of Samples	Attachment
1	Nil	Nil	Nil

2A.2.2.13: Bulk Density

SI.No.	Rock Type	Number of Samples	Minerals	Bulk Density Established (t/m ³)
1	Nil	Nil	Nil	Nil

2A.2.2.14: Area Covered under Exploration

Level of exploration	Area in Ha.		Total Area in Ha.
	Forest	Non Forest	
G-1	Nil	Nil	Nil
G-2	Nil	Nil	Nil
G-3	Nil	Nil	Nil
G-4	Nil	Nil	Nil
Area proved as Non-mineralized	Nil	Nil	Nil
Area to be explored	Nil	Nil	Nil
Total	Nil	Nil	Nil

SI.No.	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
	From	To								
1	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Potentially Mineralised area (Ha)										19.19

2A.2.3 Ore Body Geometry & Grade

SI.No.	Name of the ore band	General Strike / Trend	Dip Of Mineral Body	Average Strike Length (m)	Average Width (m)	Chemical parameters				

						Average Depth (m)	Name of the radical	Min Grade (%)	Max Grade (%)	Avg Grade (%)
1	Rengalbeda Iron deposit	NE-SW	NW	350.00	700.00	94.15	Fe	19.92	68.50	57.92

2A.2.4: Reserve / Resource Estimation Method

2A.2.4.1: Methodology

Resource / Reserve Estimation Method
Sectional Area Method
Methodology
Cross sections were prepared across the strike of the ore body at an interval of 100 m for all the section lines viz. E-1 to W-3, along which boreholes were drilled. The iron ore resource has been calculated based on the mineralized area marked in each cross section after correlation of the boreholes. a)The geometry of the ore body has been reconstructed by correlation of the borehole intersection data with 100 m borehole spacing at G-2 level. b)The strike influence has been considered in most of the cases as 50m on both directions along the strike for calculation of the volume of the ore body during estimation of resource,since borehole spacing is 100m x100m. c)For the boreholes (BH OKR-5,6,2,7 & 8) located adjacent to the leasehold boundary, the strike length is considered up to the leasehold boundary only and taken the restricted length while calculating the volume. d)The area of influence for each positive borehole has been considered in most of the cases as 100mx100m during calculation of resource by Horizontal-longitudinal Projection Method. However, the boreholes situated adjacent to leasehold area of influence has been restricted up to the leasehold boundary. The influence area of all other boreholes viz. BH OKR-5,6,2,7,8,19,20 & 21 were calculated by including left over area with respect to their adjacent vacant grids. e) The tonnage factor is considered by taking into account of average bulk density measured in field in the nearby Kalamang West Block, as there is not much difference between the ore types and zones. The bulk density has been considered is 3.5 gm/cc for HLO(LUMPS) bearing ore zone as measured in the bulk sampling method, 2.7 gm/cc for high grade ore (FINES) (powdery ore, SLO, minor HLO and minor Fe-shale/BHQ/BHJ having grade of Fe(T) > 55%) and as 2.5 gm/cc for low grade ore (FINES) (powdery ore, SLO, lateralized HLO mixed with Fe-shale & BHQ/BHJ having grade of Fe(T) in between 45-55%) as per the average bulk density measured in field.

2A.2.4.2: Resource Calculation

SI.No.	Cross Section/Bloc k	Section Area/ Block Area(sq mt)	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	E1HLO	0.00	150.00	Nil	0.00	3.50	0.00000	G2	FOREST	Fe	0	Cross- Sectional Method
2	E1HGO	2787.82	150.00	Nil	418172.40	2.70	1129065.480 00	G2	FOREST	Fe	60.29	Cross- Sectional

[illegible]

14	W3HGOOK R5	3372.67	62.00	Nil	209105.77	2.70	564585.5740 0	G2	FOREST	Fe	61.29	Cross- Sectional Method
15	W3LGOOK R5	612.81	62.00	Nil	37994.29	2.50	94985.72360	G2	FOREST	Fe	50.28	Cross- Sectional Method
16	W3HLOOK R6	0.00	79.00	Nil	0.00	3.50	0.00000	G2	FOREST	Fe	0	Cross- Sectional Method
17	W3HGOOK R6	3893.28	79.00	Nil	307569.12	2.70	830436.6240 0	G2	FOREST	Fe	61.29	Cross- Sectional Method
18	W3LGOOK R6	1223.60	79.00	Nil	96664.40	2.50	241661.0000 0	G2	FOREST	Fe	51.12	Cross- Sectional Method
19	W3HLOOK R2	666.87	96.00	Nil	64019.71	3.50	224068.9920 0	G2	FOREST	Fe	61.98	Cross- Sectional Method
20	W3HGOOK R2	4410.46	96.00	Nil	423403.78	2.70	1143190.195 00	G2	FOREST	Fe	63.66	Cross- Sectional Method
21	W3LGOOK R2	851.04	96.00	Nil	81699.84	2.50	204249.6000 0	G2	FOREST	Fe	51.21	Cross- Sectional Method
22	W3HLOOK R7	0.00	108.00	Nil	0.00	3.50	0.00000	G2	FOREST	Fe	0	Cross- Sectional Method
23	W3HGOOK R7	2274.16	108.00	Nil	245609.28	2.70	663145.0560 0	G2	FOREST	Fe	63.69	Cross- Sectional Method
24	W3LGOOK R7	0.00	108.00	Nil	0.00	2.50	0.00000	G2	FOREST	Fe	0	Cross- Sectional Method
25	W3HLOOK R8	1547.46	109.00	Nil	168673.58	3.50	590357.5160 0	G2	FOREST	Fe	60.65	Cross- Sectional

												Method
26	W3HGOOK R8	665.09	109.00	Nil	72494.59	2.70	195735.3984 0	G2	FOREST	Fe	65.64	Cross- Sectional Method
27	W3LGOOK R8	201.20	109.00	Nil	21930.80	2.50	54827.00000	G2	FOREST	Fe	49.95	Cross- Sectional Method
Total					9953258.35		27282778.96 000					

2A.2.4.3: Mineral Resource Estimate for Conversion to Mineral Reserve

Mineral resources estimated purely based on level of exploration. For the calculation of ore reserve the following parameters have been considered. a) Shape, size and continuity of ore zone, as plotted in the Geological Plan and sections. b) The depth extension of ore zone is plotted precisely in all Geological sections for the calculation of resource separately. c) Based on the past experience and field observation data, the resource have been estimated. d) The threshold value has been considered as per the IBM guidelines is >45% Fe. e) The Cutoff grade considered for estimation of resource/reserve is >45% Fe. (f) Updated pit position as on 31.03.2024. (g) Borehole collar, survey, assay & litho data from exploration. (h) Pit exposures data & Ultimate Pit. (i) The influence of the ore body has been taken @50 mtrs on either side of the grid along the strike of the bore hole drilled. No extrapolation of the ore section has been done beyond 50mtrs. (j) The depth continuity of mineralization has been considered limited to the depth up to which direct evidence of mineralization is established. (k)The lateral extension has been considered for resource assessment depending on geological continuity by mapping and has not been more than 50 mtrs of the probe point. (l) The bulk density for iron ore is 3.5,2.7 & 2.5 has been considered. (m) In total, 5nos. of cross sections at 100 m interval have been prepared for estimations of resource. (n) Reserve estimation has been carried out by Cross Sectional method.

2A.2.4.4: Threshold value & Cut off Parameters

i) The threshold value has been considered as per the IBM guidelines is >45% Fe. ii) The Cut off grade considered for estimation of ore is >45% Fe.

2A.2.4.5: Mining Factors or Assumptions

The Rengalbeda North East Iron Ore Block comes under Category-A as per the IBM guidelines. The deposit is being worked by mechanized opencast mining method engaging HEMM & deep hole blasting. The maximum bench height has been kept 10 mtr and minimum width 10 mtr with average bench slope of 75 degree. Drilling is carried out by 115/150 mm drill machine & controlled blasting is being carried out with use of NONEL to control ground vibration & optimization in blasting. After blasting, the blasted ROM is segregated at the mining face itself and is stacked into respective stacking plots depending on the content of Fe% in it.

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2A.2.4.6: Metallurgical Factors or Assumptions

The mine is supposed to produce calibrated lump ore (+10 to -40 mm) size fraction & fines ore (-10mm) size fraction for its dispatch to different sponge Iron Plant /steel plants having Final Submitted an Fe percent in the range of 60-62 percent. Long Term agreement are in the process to be signed with a number of large integrated steel plant units in Odisha, apart from the sponge iron units too located in Odisha.

2A.2.4.7: Cost & Revenue Factors

The entire ore production including lumps & chips and fines produced from Rengalbeda North East Iron Ore Block will be sold to consumers of Odisha and nearby states. To meet market demand the ore produced can be sold directly or in some cases after processing (sizing & sorting) or blended the low grade with high grade ore for making it saleable. Market demand is there for both fines and lumps & chips which are produced from the mines.

2A.2.4.8: Market Assessment

The entire ore production including lumps and fines produced from Rengalbeda North East Iron Ore Block will be sold to iron ore consumers of Odisha and nearby states. To meet market demand with about 60 percent Fe the ore produced can be sold after processing i.e. sizing and sorting. To meet market demand with 60percent Fe, both low grade ore and high grade ore produces are proposed to be blended. It can be presumed that ore produced in plan period can be blended, to meet market demand of 60percent Fe grade ore. Market demand is there for both fines (<10mm) and lumps which are produced from the mines.

2A.2.4.9: Other Modifying Factors

The entire area of 24.203 Ha. Rengalbeda North East Iron Ore Block In Village Nuagaon and Gandhalpada under Barbil Tahasil, Keonjhar district of Odisha State. The mining activity in the area has already created direct employment opportunity for the local people both directly and indirectly. Workmen to mines, supervisory staff, mining engineers, geologists, surveyors, engineers etc. are employed in the mine. In addition, it will facilitate in developing indirect employment opportunities in transport sector and work shop facilities in the surrounding areas. The lessee will extends its help and supports to welfare measures like free health checkup camps, provision of bore wells, road repairing, provision of drinking water etc. The continuation of mining work has also augmented the educational status, communication facilities, health & sanitation and overall economic condition of the people of nearby villages. The lessee contributes regularly for peripheral development of the area. The mining project has been well accepted by the general public of the surrounding villages as evident from no litigation, agitation or complain by general public have so far been recorded by the lessee. There is no National Park within 10 km radius of the ML area. Basic Infrastructure is available in the mine to facilitate the workings. There are mine office, work shop, garage, rest shelter, first aid station, firefighting stations, site Stores, VT center, Time office, canteen, laboratory, welfare center, post office etc.

2A.2.4.10: Classification

Justification of area considered for G1/G2/G3 & G4, i. Borehole spacing within 100m x 100m on a grid pattern has been considered as G1 category under 331 as per UNFC code and Borehole spacing more than 100m X 100m & less than 200m x 200m grid interval has been considered as G2 category under 332 as per UNFC code. ii. Geological mapping has been done in 1:2000 scale. iii. Detailed three-dimensional delineation of an ore body has been achieved though sampling, pit mapping etc. and relevant characteristics of the deposit are established with high degree of accuracy

using software.

2A.2.4.11: Calculation of blocked resources

SI.No.	Reserves blocked due to	Cross section/Block	Sectional area/ block area (in Sq mtr)	Influence (m)	Depth (m)	Volume (m ³)	Bulk Density (t/m ³)	Resource Quantity (t)	UNFC code	Type of Land	Name of the radical	Grade (%)	Method used for resource estimation
1	Ultimate Pit Limit	E1HGO	2427.79	150.00	Nil	364168.86	2.70	983255.92200	222	FOREST	Fe	60.29	Cross-Sectional Method
2	Ultimate Pit Limit	E1LGO	2163.25	150.00	Nil	324487.05	2.50	811217.62500	222	FOREST	Fe	49.36	Cross-Sectional Method
3	Ultimate Pit Limit	00HGO	3951.74	100.00	Nil	395173.90	2.70	1066969.53000	222	FOREST	Fe	59.38	Cross-Sectional Method
4	Ultimate Pit Limit	00LGO	911.91	100.00	Nil	91191.35	2.50	227978.37500	222	FOREST	Fe	49.91	Cross-Sectional Method
5	Ultimate Pit Limit	W1HLO	68.00	100.00	Nil	6800.20	3.50	23800.70000	222	FOREST	Fe	61.52	Cross-Sectional Method
6	Ultimate Pit Limit	W1HGO	6800.10	100.00	Nil	680009.76	2.70	1836026.35200	222	FOREST	Fe	62.63	Cross-Sectional Method
7	Ultimate Pit Limit	W2HLO	82.45	100.00	Nil	8245.27	3.50	28858.44500	222	FOREST	Fe	61.02	Cross-Sectional Method
8	Ultimate Pit Limit	W2HGO	2135.63	100.00	Nil	213563.26	2.70	576620.80200	222	FOREST	Fe	63	Cross-Sectional Method
9	Ultimate Pit Limit	W2LGO	449.27	100.00	Nil	44927.00	2.50	112317.50000	222	FOREST	Fe	49.89	Cross-Sectional

[illegible]

21	7.5 Meter Safety Barrier	00HGO	521.19	100.00	Nil	52118.80	2.70	140720.76000	222	FOREST	Fe	59.38	Cross-Sectional Method
22	7.5 Meter Safety Barrier	00LGO	137.18	100.00	Nil	13717.80	2.50	34294.50000	222	FOREST	Fe	49.91	Cross-Sectional Method
23	7.5 Meter Safety Barrier	W1HGO	491.65	100.00	Nil	49165.00	2.70	132745.50000	222	FOREST	Fe	62.63	Cross-Sectional Method
24	7.5 Meter Safety Barrier	W2HGO	849.84	100.00	Nil	84984.20	2.70	229457.34000	222	FOREST	Fe	63	Cross-Sectional Method
25	7.5 Meter Safety Barrier	W2LGO	77.36	100.00	Nil	7736.20	2.50	19340.50000	222	FOREST	Fe	49.89	Cross-Sectional Method
26	7.5 Meter Safety Barrier	W3HGOO KR5	570.22	62.00	Nil	35353.70	2.70	95454.99540	222	FOREST	Fe	61.29	Cross-Sectional Method
27	7.5 Meter Safety Barrier	W3LGOO KR5	95.93	62.00	Nil	5947.35	2.50	14868.37500	222	FOREST	Fe	50.28	Cross-Sectional Method
28	7.5 Meter Safety Barrier	W3HLOOK R8	95.45	109.00	Nil	10404.38	3.50	36415.31950	222	FOREST	Fe	60.65	Cross-Sectional Method
29	7.5 Meter Safety Barrier	W3HGOO KR8	25.03	109.00	Nil	2728.27	2.70	7366.32900	222	FOREST	Fe	65.64	Cross-Sectional Method
Total						3323133.19		8938919.20					

2A.2.4.12: Calulation of Reserves - I

SI.No.	Cross section/Block	Sectional area/ block area (in Sq	Influence (m)	Depth (m)	Volume (m ³)	Bulk Density (t/m ³)	Resource Quantity (t)	UNFC code	Type of Land	Name of the radical	Grade (%)	Method used for resource estimation
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12	W/3/HGO(O KR-6)	203.158	79.00	Nil	16049.48	2.70	43333.60	122	FOREST	Fe	61.29	Cross- Sectional Method
13	W/3/LGO(O KR-6)	988.165	79.00	Nil	78065.04	2.50	195162.59	122	FOREST	Fe	51.12	Cross- Sectional Method
14	W/3/HLO(O KR-2)	280.954	96.00	Nil	26971.58	3.50	94400.67	122	FOREST	Fe	61.98	Cross- Sectional Method
15	W/3/HGO(O KR-2)	1470.423	96.00	Nil	141160.61	2.70	381133.64	122	FOREST	Fe	63.66	Cross- Sectional Method
16	W/3/LGO(O KR-2)	826.887	96.00	Nil	79381.15	2.50	198452.88	122	FOREST	Fe	51.21	Cross- Sectional Method
17	W/3/HGO(O KR-7)	2274.16	108.00	Nil	245609.28	2.70	663145.06	122	FOREST	Fe	63.69	Cross- Sectional Method
18	W/3/HLO(O KR-8)	1144.2249	109.00	Nil	124720.51	3.50	436521.80	122	FOREST	Fe	60.65	Cross- Sectional Method
19	W/3/HGO(O KR-8)	599.722	109.00	Nil	65369.70	2.70	176498.18	122	FOREST	Fe	65.64	Cross- Sectional Method
20	W/3/LGO(O KR-8)	201.20	109.00	Nil	21930.80	2.50	54827.00	122	FOREST	Fe	49.95	Cross- Sectional Method
Total					6630125.10		18343859.76					

2A.2.4.13: Calculation of Reserves -II

Mineral	IRON ORE
Reserves/ Resources estimated as on	31/03/2024

UNIT of estimation	tonnes
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A. Mineral Reserve

Classification	Code	Quantity			Grade		Remark
		Forest	Non Forest	Total	Forest	Non Forest	
1. Proved Mineral Reserve (A)	111	0.00	0.00	0.00	0	0	NIL
2. Probable Mineral Reserve (A)	121	0.00	0.00	0.00	0	0	NIL
3. Probable Mineral Reserve (A)	122	18343859.76	0.00	18343859.76	60.06% Fe	0	Reserve Qty: (>45-55% Fe) 122-3317184.343 tonne, Fe- 50.25%, (>55% Fe) Qty- 15026675.41 tonne, Fe- 62.23%

B. Remaining Resources

Classification	Code	Quantity			Grade		Remark
		Forest	Non Forest	Total	Forest	Non Forest	
1. Feasibility Mineral Resource (B)	211	0.00	0.00	0.00	0	0	NIL
2. Prefeasibility Mineral Resource (B)	221	0.00	0.00	0.00	0	0	NIL
3. Prefeasibility Mineral Resource (B)	222	8938919.20	0.00	8938919.20	59.77% Fe	0	Blocked Resource: Qty (>45-55% Fe) 222-1379721.33 tonne, Fe- 49.64% , (>55% Fe) Qty- 7559197.867 tonne, Fe- 61.61%
4. Measured Mineral Resource (B)	331	0.00	0.00	0.00	0	0	NIL
5. Indicated Mineral	332	0.00	0.00	0.00	0	0	NIL

Resource (B)							
6. Inferred Mineral Resource (B)	333	0.00	0.00	0.00	0	0	NIL
7. Reconnaissance Mineral Resource (B)	334	0.00	0.00	0.00	0	0	NIL
Total Mineral Resources (A+B) :				27282778.96			

2A.2.4.13: Calculation of Reserves -III

No associate minerals are available!

2A.2.5: Future Exploration Proposal

2A.2.5.1: Geological Mapping

SI.N.	Year	Scale	Area Covered (Ha)
1	Year1	1:2000	10.47
2	Year2	1:2000	8.03
3	Year3	1:2000	5.70

2A.2.5.2: Ground Geophysical Survey

SI.No.	Year	Type of Survey	Spacing (m)	Total line (km)	Area Covered (Ha)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
						From	To	From	To
1	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

2A.2.5.3: Pitting

Number of Pits
Nil

SI.No.	Year	Land Type	Pit ID	Length of Pit (m)	Width of Pit (m)	Depth of Pit (m)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
							From	To	From	To
1	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

2A.2.5.4: Trenching

Number of Trenches										
0										

2A.2.5.4.1: SPACING

Min (m)			Max (m)			Avg (m)		
0.00			0.00			0.00		

2A.2.5.4.2: Area Covered Under Trenching

Co-ordinates

SI.No.	Year	Land Type	Trench ID	Length of Trench (m)	Width of Trench (m)	Depth of Trench(m)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
							From	To	From	To
1	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

2A.2.5.5: Exploratory Drilling

2A.2.5.5.1: Core Drilling & Non-Core Drilling

SI.No.	Year	In Forest Area				In Non Forest Area				Total Borehole	Total Meter
		No. of Borehole	Total Mtr	Type Borehole	Grid Interval	No. of Borehole	Total Mtr	Type Borehole	Grid Interval		

1	Year1	21	2100.00	Core	50.00	0	0.00	Nil	0.00	21	2100.00
2	Year2	14	1400.00	Core	50.00	0	0.00	Nil	0.00	14	1400.00
3	Year3	23	2300.00	Core	50.00	0	0.00	Nil	0.00	23	2300.00

2A.2.5.6: Exploratory Mining

SI.No.	Year	Pit ID	Length in meter	Width in meter	Depth in meter	Volume (m³)
1	Nil	Nil	Nil	Nil	Nil	Nil

2A.2.5.7: Sampling

SI.No.	Year	Type of Sample	Number of Samples Proposed	Area Covered(Ha)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
					From	To	From	To
1	Year1	Drill Core	1680	5.25	21:57:56.48	21:57:58.17	85:16:25.19	85:16:21.93
2	Year2	Drill Core	1120	3.50	21:57:52.47	21:58:03.72	85:16:15.52	85:16:11.79
3	Year3	Drill Core	1840	5.75	21:58:04.58	21:58:04.08	85:16:13.25	85:16:15.69

2A.2.5.8 Petrographic & Mineralgraphic Studies

SI.No.	Year	Type of Sample	Number of Samples Proposed
1	Nil	Nil	Nil

Chapter 2B : Geology & Exploration UG : NA

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Chapter 3: Mineral Beneficiation / Processing

Name of The Ore/Mineral	Hematite
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3.1: Mineralogy of the ROM ore/ Mineral

Sl.No	Valuable Mineral Name	Approx. Mineral %	Gangue Mineral/s name	Approx. Mineral Gangue %
1	Hematite	84.3600	GoethiteLimonite	15.6400

3.2: Complete Chemical Analysis of the ROM Ore/Mineral

Sl.No	Radical	Wt%
1	Fe	59.0500
2	SiO2	3.3800
3	Al2O3	5.1700
4	CaO	0.1500
5	MgO	0.2000
6	TiO2	0.2600
7	Mn	0.0800
8	LOI	6.3500
9	P	0.0500

3.3: Crushing Section

3.3.1: Primary Crushing

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

3.3.2: Secondary Crushing

SI.No	Type of Crusher	Make	Capacity of Crusher(tph)	Feed Size(mm)	Product Size(mm)
1	Cone Crusher	METSO (may change as per suitability and availability)Cone crusher-I	200	-80.0000	-40.0000

3.3.3: Tertiary Crushing

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

3.4: Grinding Section

3.4.1: Dry Grinding

SI.No	Type of Mill	Stages	Make of the Mill	Feed Flow Rate(tph)	Feed Size(mm)	Product Size Mill Discharge(m m)	Type of Screen	Make	Aperture Size of Screen/Classifier (mm), if applicable	Classifier / Screen undersize (tph)	Classifier / Screen oversize (tph)
1	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

3.4.2: Wet Grinding

SI.No	Type of Mill	Stages	Make of the Mill	Feed Flow Rate(tph)	Feed Size(mm)	Product Size(mm)	Type of Screen/Classifier	Aperture Size of Screen/Classifier	Classifier / Screen undersize	Classifier / Screen oversize	Water Requirement(l/h)	Fresh Water Requirement(l/h)	Recirculate d Water(l/h)
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								r (mm), if applicable	(tph)	(tph)			
1	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

3.5: Dry Processing

3.5.1: Screening and Classification

SI.No	Type of Screen/Classifier	Stages	Make	Capacity(tph)	Aperture Size of Screen/Classifier (mm), if applicable	Feed Size(mm)	Product (mm)	Product Quality(if applicable)
1	Screen Plant1	Single	METSO or (other make as per suitability)	600.0000	40.0000	-80.0000	-40.0000	+45%Fe
2	Screen Plant2	Single	METSO or (other make as per suitability)+10 mm to -40mm CLO	600.0000	10.0000	-40.0000	10.0000	+45%Fe
3	Screen Plant2	Single	METSO or (other make as per suitability)(-10mm Fines)	600.0000	10.0000	-40.0000	-10.0000	+45%Fe
4	Screen Plant2	Single	METSO or (other make as per suitability)+10 mm to -40mm CLO	600.0000	40.0000	-40.0000	-40.0000	+45%Fe

3.5.2: Other Operations

Not Applicable

3.5.3: Product Quality

Products	Wt%	In Tonnes	Size (Range) mm	Complete chemical analysis
Concentrate	100.0000	2000000.0000	+10 MM to -40 mm & -10mm	+45%Fe,SiO2-3.38%,Al2O3-5.17%,CaO-0.15%,MgO-0.2%,TiO2-0.26%,Mn-0.8%,LOI-6.35%,P-0.05
Sub-grade	0.0000	0.0000	0	Nil
Rejects	0.0000	0.0000	0	Nil

3.6: Wet Processing

3.6.1: Scrubbing / Washing

SI.No	Type of Scrubbers / washers	Stages, if applicable	Make	Capacity(tph)	Feed Size(mm)	Product Size (mm)	Product Quality, if available	Water Requirement(l/h)	Fresh Water Requirement (l/h)	Recirculated Water (l/h)
1	Not Applicable	Not applicable	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

3.6.2: Screening and Classification

SI.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)	Product Quality, if available	Water Requirement(l/h)	Fresh Water Requirement (l/h)	Recirculated Water (l/h)
1	Not Applicable	Not applicable	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

3.6.3: Gravity Separation

SI.No	Type of separators (jig, table, spiral, etc.)	Stages, if applicable	Make	Capacity(tph)	Feed Size(mm)	Product (Conc) (tph)	Product-Mid (tph), if available	Product-Tail (tph)	Water Requirement(l/h)	Fresh Water Requirement (l/h)	Recirculated Water (l/h)
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1	Not Applicable	Not Applicable	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
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3.6.4: Magnetic Separation

SI.No	Type of magnetic separators (magnetic intensity)	Stages, if applicable	Make	Capacity(tph)	Feed Size(mm)	Product-Mag (tph)	Product-Mid (tph), if available	Product non-Mag (tph)	Water Requirement(l/h)	Fresh Water Requirement (l/h)	Recirculated Water (l/h)
1	Not Applicable	Not Applicable	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

3.6.5: Flotation

SI.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)	Water Requirement(l/h)	Fresh Water Requirement (l/h)	Recirculated Water (l/h)
1	Not Applicable	Not Applicable	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

3.6.6: Other Operations

SI.No	Type of equipment / operation	Stages, if applicable	Make	Capacity(tph)	Feed Size(mm)	Product-Conc (tph)	Product-Mid (tph), if available	Product-Tail (tph)	Water Requirement(l/h)	Fresh Water Requirement (l/h)	Recirculated Water (l/h)
1	Not Applicable	Not applicable	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

3.6.7: Product Quality (wet processing)

Products	Wt%	In Tonnes	Size (Range) mm	Complete chemical analysis
Concentrate	0.0000	0.0000	0	Not Applicable
Sub-grade	0.0000	0.0000	0	Not Applicable
Rejects	0.0000	0.0000	0	Not Applicable

3.7: Overall Product Quality (Dry cum Wet Processing)

Products	Wt%	In Tonnes	Size (Range) mm	Complete chemical analysis
Concentrate	100.0000	2000000.0000	+10mm to -40mm & -10mm	+45% Fe,SiO2-3.38%,Al2O3-5.17%,CaO-0.15%,MgO-0.2%,TiO2-0.26%,Mn-0.8%,LOI-6.35%,P-0.05%
Sub-grade	0.0000	0.0000	Nil	Not Applicable
Rejects	0.0000	0.0000	Nil	Not Applicable

3.8: Disposal Method for tailing/ rejects

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 neutralise its effect (if any)	Nil
c) Any other data (if available)	Nil

3.9: Overall water requirement of mining and mineral processing

Indicate quantity, source of supply, disposal of water and extent of recycling and chemical analysis of water	Water_Balance.pdf
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3.10: Flow sheets and charts

Material balance chart of mineral processing plant(s) (each stage of process)	Material_balance_Rengalbeda.pdf
Attach flow sheet of beneficiation of plant(s)	Nil
Any other data (if applicable)	Nil

Approved

Chapter 4A: Mining Operations

4A.1.1: Existing Method of Mining		Manual		
4A.1.2: Proposed Method of Mining		Mechanized		
Choose one or more	HEMM with deephole drilling	Combination of loaders and tippers	None	None
Reasons for Proposed Changes		Mining Plan submitted based on revised LOI HEMMs with deep hole drilling and blasting in 3 shift operations The maximum height and minimum width of the benches has been maintained at 10mtr and 10 mtr respectively Average bench slope is 75 degree Drill hole diameter is 115 to 150mmBlasting is carried out with emulsion slurry explosive NONEL is used to control blasting better fragmentation		

4A.2: Operational Parameters

4A.2.1: Inventory of Existing Pits & Dumps

4A.2.1.1: Pits

Sl.No.	Pit ID	Pit Status	Area Covered by Pit(Ha)	Pit Dimensions(L*W*D)
1	Not applicable	Nil	Nil	Nil

4A.2.1.2: Dumps and Stacks

4A.2.1.2.1: Dump Details

SI.No.	Dump ID	Dump Status	Type of Dump	Total of Dump Quantity(t)	Area Covered by Dump(Ha)	Height(m)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
							From	To	From	To
1	NA	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

4A.2.1.2.2: Stack Details

SI.No.	Stack ID	Type of Stack	Total Stack of Quantity(t)	Area Covered by Stack(Ha)	Height(m)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
						From	To	From	To
1	NA	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

4A.2.1.3: Details of stabilised dumps

SI.No.	Dump ID	Number of Terraces	Average Height of Terraces(m)	Lenght of Toe Wall(m)	Lenght of Garland Drain(m)	Area Stablized(Ha)	Method of Stablization
1	NA	Nil	Nil	Nil	Nil	Nil	Nil

4A.2.2: Opencast Mining

4A.2.2.1: Bench Parameters

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 (mRL)	Max Slope Angle of Haul Roads (1xx in)
Quarry-1	Year1	10.00	10.00	75.00	10.00	10.00	75.00	22.00	0	1	2	22.00	540.00	1:16
Quarry-1	Year2	10.00	10.00	75.00	10.00	10.00	75.00	23.20	0	1	4	42.00	540.00	1:16
Quarry-1	Year3	10.00	10.00	75.00	10.00	10.00	75.00	24.55	0	1	7	72.00	540.00	1:16

Quarry-1	Year4	10.00	10.00	75.00	10.00	10.00	75.00	23.38	0	1	8	85.75	540.00	1:16
Quarry-1	Year5	10.00	10.00	75.00	10.00	10.00	75.00	24.00	0	1	8	85.75	540.00	1:16

4A.2.2.2: Yearwise Opencast Development - I Continue

Sl.No.	Year	Pit ID	Bench	Direction	Bulk Density of Overburden (BD1) (ton/m³)	Bulk Density of Mineral (BD2) (tonn/m³)	Top Soil Volume (Length x Width x Height) (m³)	Over Burden Volume (Length x Width x Height) (m³)	Over Burden Quantity (t)	ROM Volume (Length x Width x Height) (m³)	ROM Quantity (t)	Recovery	Mineral Reject (t)	Production Main (t)	Production Associated (t)	OB Ratio to Ore (m³/ton)
1	Year1	Quarry-1	Bench-580 to 570	East-West	2.00	2.75	0.00	46870.64	93741.28	181818.18	500000.00	1.00000	0.00	500000.00	0.00	0.0937
2	Year2	Quarry-1	Bench-580 to 560	EastWest	2.00	2.85	0.00	92616.11	185232.22	350877.19	1000000.00	1.00000	0.00	1000000.00	0.00	0.0926
3	Year3	Quarry-1	Bench-580 to 530	East-West	2.00	2.70	0.00	56358.62	112717.24	740740.74	2000000.00	1.00000	0.00	2000000.00	0.00	0.0282
4	Year4	Quarry-1	Bench-580 to 500	East-West	2.00	2.78	0.00	79675.54	159351.08	719424.46	2000000.00	1.00000	0.00	2000000.00	0.00	0.0398
5	Year5	Quarry-1	Bench-580 to 500	East-West	2.00	2.97	0.00	125699.33	251398.65	673400.67	2000000.00	1.00000	0.00	2000000.00	0.00	0.0628
Total									802440.47		7500000.00		0.00	7500000.00	0.00	

4A.2.2.2 Yearwise Opencast Development - I End

Sl.No.	Year	Pit ID	Total Topsoil Volume (m³)	Total Over Burden Volume (m³)	Total Over Burden Quantity (t)	Total ROM Volume (m³)	Total ROM Quantity (t)
1	Year1	Quarry-1	0.00	46870.64	93741.29	181818.18	500000.00
2	Year2	Quarry-1	0.00	92616.11	185232.22	350877.19	1000000.00
3	Year3	Quarry-1	0.00	56358.62	112717.23	740740.74	2000000.00

4	Year4	Quarry-1	0.00	79675.54	159351.08	719424.46	2000000.00
5	Year5	Quarry-1	0.00	125699.33	251398.66	673400.67	2000000.00
Total			0.00	401220.24	802440.48	2666261.24	7500000.00

4A.2.2.3: Transportation & Hauling Equipment

Sl.No.	Type	Make	Capacity (m³)	No. of Equipments
1	Water Tanker	Volvo	26.00	2
2	Truck	Ashok Leyland	6.00	3
3	Dumper	Tata	22.00	7
4	Dumper	Tata	16.00	10

4A.3: Material Handling Summary

4A.3.1: Studies Undertaken

Title	Study Undertaken	Attachment (only pdf allowed)
Blast Vibration Study Report	No	Nil
Slope Stability Study Report	Yes	Undertaking for require study.pdf
Recovery Study Report	Yes	Undertaking for require study.pdf
Hydrological Study Report	Yes	Undertaking for require study.pdf
Mineral Beneficiation Study Report	No	Nil
Subsidence Study Report	No	Nil
Geotechnical Study Report	Yes	Undertaking for require study.pdf
Any Other Study Report	Yes	172741994866f6562c832eeUndertaking for require study.pdf
Bulk Density Study Report	Yes	Undertaking for require study.pdf

4A.3.2: Insitu Mining

SI.No.	Year	Waste Quantity(t)	ROM Quantity(t)	Total Handling (t)	ROM Quantity Saleable Mineral (t)	ROM Quantity Mineral Reject (t)	OB Ratio to Ore (Waste Quantity / ROM Quantity)	Grade Range (%)
1	Year1	93741.29	500000.00	593741.29	500000.00	0.00	0.19	50to63% Fe (58.3)
2	Year2	185232.22	1000000.00	1185232.22	1000000.00	0.00	0.19	50 to 63 % Fe(60.9)
3	Year3	112717.23	2000000.00	2112717.23	2000000.00	0.00	0.06	50 to 63 % Fe(58.8)
4	Year4	159351.08	2000000.00	2159351.08	2000000.00	0.00	0.08	50 to 63 % Fe(59.0)
5	Year5	251398.66	2000000.00	2251398.66	2000000.00	0.00	0.13	50 to 63 % Fe(61.52
	Total	802440.48	7500000.00	8302440.48	7500000.00	0.00		

4A.3.3: Dump workings

SI.No.	Year	Dump ID	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)		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 (%)	Justificati on
			From	To	From	To									
1	Nil	NA	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

4A.3.4: Calculation Summary

Year	Year1	Year2	Year3	Year4	Year5	Total
(A) Total ROM quantity (t)	500000.00	1000000.00	2000000.00	2000000.00	2000000.00	7500000.00
(B) Saleable ore from ROM (t)	500000.00	1000000.00	2000000.00	2000000.00	2000000.00	7500000.00
(C) Proposed Dump	0.00	0.00	0.00	0.00	0.00	0.00

Handling Quantity (t)						
(D) Saleable Ore recovered from dump workings (t)	0.00	0.00	0.00	0.00	0.00	0.00
(E) Total Saleable Ore (t)(=B+D)	500000.00	1000000.00	2000000.00	2000000.00	2000000.00	7500000.00
(F) Total Quantity Handled (t)(=A+C)	500000.00	1000000.00	2000000.00	2000000.00	2000000.00	7500000.00

4A.4: Machine Calculation

4A.4.1: Machine Requirement Summary

Number of Average Working Days in One Year (A)	300
Number of Shifts per Day (B)	3
Material Handling Required per Day (t) ((D)=Largest of (Q1,Q5)/(A))	7504.66
Material to be Handled per Shift (t) ((E)=(D)/(B))	2501.55
Handling Required per Hour (t) ((F)=(E)/8 hours)	416.93
Effective Shift Time	6 hrs 00 mins

4A.4.2: Shovel / Excavator Requirement

Effective Shift Time					6 hrs					00 mins				
Sl.No.	Type	Bucket Capacity (m ³)(A)	Bucket Fill Factor (B)	Swell Factor (C)	Tonnage Factor (t/m ³) (D)	Machine Utilization Factor (%) (U)	Efficiency (%) (E)	Cycle time (sec) (F)	(G) TPH =TPH (G) =((3600 x A x B x C x D x E x U) / F)	Total Hours (H) =Number of working days x Number of shifts/day x Effective	Yearly handling by one Excavator (t) (I)=(G x H)	Maximum handling of the material by this machine during the block	Number of excavator machines required (K) = (J / I)	Standby excavator (L)

										shift hours		period (t) (J)		
1	Excavator	4.50	0.6	0.8	2.97	0.60	0.60	50	166.28	5400	897912.00	2000000.0 0	2.23	3
2	Excavator	2.50	0.6	0.8	2.00	0.60	0.60	70	44.43	5400	239922.00	251399.00	1.05	2
3	Excavator	2.50	0.8	0.8	3.20	0.70	0.70	50	180.63	5400	975402.00	2000000.0 0	2.05	3

4A.4.3: Dumper Requirement

Effective Shift Time					6 hrs					00 mins				
Sl.No.	Total Hour s=Number of working days (W)x Number of shifts/day x Effective shift hours (Machine Requireme nt Summary) (A)	Capacity of Dumpers (t) (B)	Speed of the dumper (KMPH) (i)	Lead Distance (KM) (ii)	Time taken to cover distance in minutes(iii) =(ii/i) x 60	Queuing, Loading Time at Shovel (min) (iv)	Queuing, Unloading Time during unloading (min) (v)	Total Time to complete one trip(vi) = (iii + iv + v)	No. of Trips / hr = (60 / vi)	Total trans portation per hour =(B X vii)	Yearly handling by one dumper (ix) = A x TPH	Maximum handling of the material by this machine during the block period (t) (x)	Number of dumpers will be (xi) =(x / ix)	Plus Standby dumper (xii)
1	5400	50.00	20.00	5.00	15.00	10.00	10.00	35.00	1	85	461700.00	2000000.0 0	4	3
2	5400	35.00	20.00	2.00	6.00	5.00	5.00	16.00	3	131	708750.00	2000000.0 0	3	3
3	5400	35.00	20.00	4.00	12.00	15.00	15.00	42.00	1	50	270270.00	251399.00	2	2

4A.4.4: Drill Machine Requirement

Effective Shift Time	6 hrs	00 mins
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SI.No.	Type of Drill	Depth of Hole(including Sub-grade Drilling (m)	Spacing (m)	Burden (m)	Bulk Density of Waste (t/m ³)	Bulk Density of Mineral (t/m ³)	Yield per Hole (t)	Yield per Meter (t/m) = Yield per Hole (t)/Depth of Hole(including Sub-grade Drilling (m))	Annual Target Known (t)	Drilling Requirement per Day (m) = (Annual Target Known (t) / Yield per Meter (t/m))/Number of Average Working Days in One Year (A)	Drilling Requirement per Shift(m)	Rate of Drilling per Hours (m/hr) = Drilling Requirement per Shift (m)/Effective Shift Time	Required No. of drills (m/c) = Required rate of drilling in meters per hr./ Actual rate of drilling in meters per hr of the machine deployed	Stand by Drill
1	Hydraulic	11.00	3.00	2.50	2.00	3.00	225.00	20.45	1200000.00	195.59	65.19	10.86	3.00	1

4A.4.5: Machine Deployment Details

4A.4.5.1: Excavator & Loading Equipment

SI.No.	Type	Make	Capacity (m ³)	No. of Equipments
1	Excavator	Tata Hitachi(other Applicable Make)	4.50	5
2	Excavator	Tata Hitachi(other Applicable Make)	2.50	8
3	Loader	HM2021/Volvo	1.50	4

4A.4.5.2: Dozers Details

SI.No.	Type	Make	Capacity (hp)	No. of Equipments
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Sl.No.	Type	Make	Capacity (m/hr)	Diameter of Hole(mm)
1	Hydraulic	Atlas Copco(other Suitable Make)	7.05	115.00

SI.No.	Drill Pattern / Spacing of Holes (m)	Burden of Holes (m)	Number of Rows / Rings	Yield per Holes in Waste (m ³)	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 (t/kg)	Depth Of Hole
1	3	2.5	2	75	1	25	35	875	3500	4.29	10

Type of Explosive	Type of Explosives used / to be Used
Slurry Explosives	Aluminised Gelled Slurry Explosives (Small Diameter)

SI.No.	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 (m ³)	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)	Charge per Round (kg)	Explosive Requirement Per Month for ROM Zone Blasting (kg)	Powder Factor in Ore (t/kg)	Pop Shooting (no of Boulders)	Plaster Shooting (no of Boulders)	Use of Rockbreaker	Capacity	Secondary Blasting Requirements	Depth Of Hole
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1	400000	1333.333333	3	2.5	3	75	2	60	60	40	2400	19200	5.25	0	0	Yes	228	0	10
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4A.6: Man Power Deployment

4A.6.1: Managerial

Sl.No.	Particular	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	0	0	0	2	2
2	2nd Class Manager	1	1	1	2	5
3	Mining Engineer	0	0	0	1	1
4	Geologist	1	1	1	1	4
5	Mechanical Engineer	0	0	0	1	1

4A.6.2: Supervisory

Sl.No.	Particular	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	Foreman	2	2	2	2	8
2	Mine-mate	2	2	2	2	8
3	Blaster	0	0	0	2	2
4	other	0	0	0	2	2

4A.6.3: Skilled Workers / Operators

Sl.No.	Particular	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	Pump Operator	1	1	1	1	4

2	Dumper Operator	10	10	10	10	40
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4A.6.4: Semi-skilled Workers

SI.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	20	20	20	10	70

4A.6.5: Unskilled Workers

SI.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	25	25	25	20	95

4A.6.6: Others Specify

SI.No.	Particular	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	Nil	Nil	Nil

4A.6.7: No of Persons Engaged Per Day

SI.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	62	62	62	56	243
No of Shifts per Day ((A) = Machine Requirement Summary (B))			3		
Average Daily Employment per Shift ((B) = (Total Number of Person per Day) / (A))			81		
Material to be Handled per Shift ((C) = Machine Requirement Summary (E))			2501		

4A.6.8: Supervision

Sl.No.	Particular	Qualification	Requirement / Proposed	In Position / Existing Strength	(Requirement / Proposed) - (In Position / Existing Strength) = (-) Shortage / (+) Excess	Remarks
1	Mines Manager	1ST/2ND CLASS MANAGER CERTIFICATE/ B.TECH IN MINING ENGINEERING	1	1	0	Ok
2	Assistant Manager	1ST/2ND CLASS MANAGER CERTIFICATE/ B.TECH IN MINING ENGINEERING	2	2	0	Ok

4A.7: Waste Management

4A.7.1: Existing Dump

[illegible]

4A.7.2: New Dump

[illegible]

2	Year2	Dump1	Waste	2.31	13.00	21:58:01.53	21:58:08.71	85:16:18.93	85:16:25.07	92616.11	East side of lease
3	Year3	Dump2	Waste	2.74	40.00	21:57:59.21	21:58:07.56	85:16:04.40	85:16:14.12	56358.62	North side of lease
4	Year4	Dump3	Waste	0.86	20.00	21:57:59.47	21:58:04.86	85:16:19.15	85:16:19.36	79675.54	Within quarry eastern side temporary waste dump
5	Year5	Dump3	Waste	1.85	40.00	21:57:58.85	21:58:05.92	85:16:15.72	85:16:21.05	125699.33	Within quarry eastern side temporary waste dump

4A.7.3: Existing Stack

SI.No.	Year	Stack ID	Type of Stack	Proposed Area (ha)	Height (m)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)		Total Stack Quantity (m³)	Existing Stack Location
						From	To	From	To		
1	Nil	NA	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

4A.7.4: New Stack

SI.No.	Year	Stack ID	Type of Stack	Proposed Area (ha)	Height (m)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)		Total Stack Quantity (m³)	New Stack Location
						From	To	From	To		
1	Year1	Stack1	Stack for mineral	5.99	2.78	21:57:52.40	21:58:07.78	85:16:04.15	85:16:14.74	166666.67	West side of lease
2	Year2	Stack1	Stack for mineral	5.99	5.50	21:57:52.40	21:58:07.78	85:16:04.15	85:16:14.74	333333.33	West side of lease
3	Year3	Stack1	Stack for mineral	2.75	20.00	21:57:52.49	21:57:58.86	85:16:10.39	85:16:10.78	550000.00	West side of lease
4	Year4	Stack1	Stack for mineral	2.44	20.00	21:57:52.49	21:57:58.86	85:16:10.39	85:16:10.57	488000.00	West side of lease
5	Year5	Stack1	Stack for	1.49	20.00	21:57:53.67	21:57:58.86	85:16:10.39	85:16:09.62	298000.00	West side of

			mineral								lease
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4A.8: Mineral Waste Handling To Utilize As Minor Mineral

SI.No.	Year	Dump ID	Type of Dump	Proposed Area (ha)	Quantity Handled (t)	Quantity Recovered (t)	Name Of Minor Mineral	Alternative Waste Utilization (m³)
1	Year5	Dump1	Waste	2.31	100000.00	0.00	FeroginousshaleLat erite	50000.00

4A.9: Use of Minerals

SI.No.	Proposed Use Of Mineral	Name Of Mineral	Relevant Use Of Mineral	Physical Specifications	Chemical Specifications
1	Direct Selling	IRON ORE	Steel Plants & Sponge Iron Plants	10-40mm lump	+45% Fe,SiO2- 2% (Max).
2	Direct Selling	IRON ORE	Steel Plants & Sponge Iron Plants	0-10mm fines	+45% Fe,SiO2- 2% (Max).

* Choose among these:

1. Captive use in own industry
2. Direct Selling
3. Selling Post-Beneficiation /Up-gradation

*Select more than one, if applicable

Chapter 4 B : Mining Operations UG : NA

Approved

Chapter 5: Sustainable Mining

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

Sustainable development is integral to the company’s essence and OMC is committed to excel on social and environmental performance with Implementation & compliance of Rule 35 of MCDR 2017. OMC has mandated planting of 1 tree per 10 tons of ore raised, resulting plantation of more than 7 million trees till date in the mines peripheral areas. Regular plantation drives, will be done inside Mining Leasehold areas. State of the Art Sewage Treatment Plants will be set up with a provision of recycling water for dust suppression and green belt development within mines premises. With an aim to keep the ambient air clean within and around the mines premises, adequate water sprinkling arrangement through mobile tankers, fixed type auto sprinklers, mist canon and dry fog systems will be installed at the dust prone areas within mines. To have a vigilant eye on air pollution levels continuous online air quality systems will be installed at various mines. Full-fledged solar power plants and sensor-based solar street lights will also install across Mining Leasehold areas. Advanced integrated solid waste and dump management systems, as well as the in-depth noise vibration surveys will be conducted regularly. OMC regulates its carbon footprint through company’s wide digitization, which includes initiatives like a seamless & automated traffic management system and a barrage of other automated processes. The mine will be formed Sustainable Development Unit (SDU) consisting of multi disciplinary persons from Mining, Personnel, Geology , Forest & Environment & Finance. Also compliance of Vishakha Committee for prevention women harassment at work place will be implemented headed by a woman employee and not less than half of its member would be women.

(Total 200 characters)

Compliance of Vishakha Committee Guidelines for prevention of women harassment at workplace	Implemented
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5.2: CSR INITIATIVES

5.2.1: Year1

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)
0.01	0.01
5.2.1.2: Area for Water Storage & Recharge Facility	

Area (Ha)	Area (Ha)
0.01	0.01
5.2.1.3: Efforts Made towards Housing for Local Communities	
Number of Houses	Number of Houses
3	3
5.2.1.4: Efforts Made towards Providing Transport to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
100	100
5.2.1.5: Efforts Made towards Providing Healthcare to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
100	100
5.2.1.6: Efforts Made towards Providing Hygiene & Sanitation to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
100	100
5.2.1.7: Efforts Made towards Skill Development Programs to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
5	5
5.2.1.8: Efforts Made to Promote Education & Knowledge Based Initiatives	
Number of Beneficiaries	Number of Beneficiaries
5	5
5.2.1.9: Communication Facilities Provided to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
100	100

5.2.1.10: Any Other Steps Taken for Improving the Socio-Economic Standard of Local Communities	
Number of Beneficiaries	Number of Beneficiaries
10	10

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
1	1	50

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)
100000.00	0.00

5.2.1.14: Water & recycled use	
Total water consumption (KLD)	Water recycled (% of total)
180.00	0.00

5.2.2: Year2

Details of Work Proposed during the Year / Measures Planned for the Affected Segment	Cumulative Work done / Measures Taken
5.2.2.1: Area to be Developed for Recreation	
Area (Ha)	Area (Ha)
0.01	0.02

5.2.2.2: Area for Water Storage & Recharge Facility	
Area (Ha)	Area (Ha)
0.01	0.02

5.2.2.3: Efforts Made towards Housing for Local Communities

Number of Houses	Number of Houses
2	5

5.2.2.4: Efforts Made towards Providing Transport to Local Communities

Number of Beneficiaries	Number of Beneficiaries
100	200

5.2.2.5: Efforts Made towards Providing Healthcare to Local Communities

Number of Beneficiaries	Number of Beneficiaries
100	200

5.2.2.6: Efforts Made towards Providing Hygiene & Sanitation to Local Communities

Number of Beneficiaries	Number of Beneficiaries
100	200

5.2.2.7: Efforts Made towards Skill Development Programs to Local Communities

Number of Beneficiaries	Number of Beneficiaries
5	10

5.2.2.8: Efforts Made to Promote Education & Knowledge Based Initiatives

Number of Beneficiaries	Number of Beneficiaries
5	10

5.2.2.9: Communication Facilities Provided to Local Communities

Number of Beneficiaries	Number of Beneficiaries
100	200

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

Number of Beneficiaries	Number of Beneficiaries
10	20

5.2.2.11: Adoption of ODF		
Number of Toilets Built inside the Lease Area	Number of Toilets Built outside the Lease Area:	Number of Beneficiaries
1	1	50

5.2.2.12: Awareness Program among Mine Workers for Swatchata	
Number of Swatchata Programmes Proposed	Number of Swatchata Programmes Held
1	1

5.2.2.13: Efforts for green energy	
Total energy consumption (KWh)	Green energy consumption (% of total)
100000.00	1.00

5.2.2.14: Water & recycled use	
Total water consumption (KLD)	Water recycled (% of total)
180.00	2.00

5.2.3: Year3

Details of Work Proposed during the Year / Measures Planned for the Affected Segment	Cumulative Work done / Measures Taken
5.2.3.1: Area to be Developed for Recreation	
Area (Ha)	Area (Ha)
0.01	0.03

5.2.3.2: Area for Water Storage & Recharge Facility	
Area (Ha)	Area (Ha)
0.01	0.03

5.2.3.3: Efforts Made towards Housing for Local Communities	
Number of Houses	Number of Houses
2	7

5.2.3.4: Efforts Made towards Providing Transport to Local Communities

Number of Beneficiaries	Number of Beneficiaries
100	300

5.2.3.5: Efforts Made towards Providing Healthcare to Local Communities

Number of Beneficiaries	Number of Beneficiaries
100	300

5.2.3.6: Efforts Made towards Providing Hygiene & Sanitation to Local Communities

Number of Beneficiaries	Number of Beneficiaries
100	300

5.2.3.7: Efforts Made towards Skill Development Programs to Local Communities

Number of Beneficiaries	Number of Beneficiaries
5	15

5.2.3.8: Efforts Made to Promote Education & Knowledge Based Initiatives

Number of Beneficiaries	Number of Beneficiaries
5	15

5.2.3.9: Communication Facilities Provided to Local Communities

Number of Beneficiaries	Number of Beneficiaries
100	300

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

Number of Beneficiaries	Number of Beneficiaries
10	30

5.2.3.11: Adoption of ODF

Number of Toilets Built inside the Lease Area	Number of Toilets Built outside the Lease Area:	Number of Beneficiaries
1	1	50

5.2.3.12: Awareness Program among Mine Workers for Swatchata	
Number of Swatchata Programmes Proposed	Number of Swatchata Programmes Held
1	2
5.2.3.13: Efforts for green energy	
Total energy consumption (KWh)	Green energy consumption (% of total)
200000.00	1.00
5.2.3.14: Water & recycled use	
Total water consumption (KLD)	Water recycled (% of total)
180.00	2.00

5.2.4: Year4

Details of Work Proposed during the Year / Measures Planned for the Affected Segment	Cumulative Work done / Measures Taken
5.2.4.1: Area to be Developed for Recreation	
Area (Ha)	Area (Ha)
0.01	0.04
5.2.4.2: Area for Water Storage & Recharge Facility	
Area (Ha)	Area (Ha)
0.01	0.04
5.2.4.3: Efforts Made towards Housing for Local Communities	
Number of Houses	Number of Houses
2	9
5.2.4.4: Efforts Made towards Providing Transport to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
100	400

5.2.4.5: Efforts Made towards Providing Healthcare to Local Communities

Number of Beneficiaries	Number of Beneficiaries
100	400

5.2.4.6: Efforts Made towards Providing Hygiene & Sanitation to Local Communities

Number of Beneficiaries	Number of Beneficiaries
100	400

5.2.4.7: Efforts Made towards Skill Development Programs to Local Communities

Number of Beneficiaries	Number of Beneficiaries
5	20

5.2.4.8: Efforts Made to Promote Education & Knowledge Based Initiatives

Number of Beneficiaries	Number of Beneficiaries
5	20

5.2.4.9: Communication Facilities Provided to Local Communities

Number of Beneficiaries	Number of Beneficiaries
100	400

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

Number of Beneficiaries	Number of Beneficiaries
10	40

5.2.4.11: Adoption of ODF

Number of Toilets Built inside the Lease Area	Number of Toilets Built outside the Lease Area:	Number of Beneficiaries
1	1	50

5.2.4.12: Awareness Program among Mine Workers for Swatchata

Number of Swatchata Programmes Proposed	Number of Swatchata Programmes Held
1	3

5.2.4.13: Efforts for green energy	
Total energy consumption (KWh)	Green energy consumption (% of total)
200000.00	2.00

5.2.4.14: Water & recycled use	
Total water consumption (KLD)	Water recycled (% of total)
180.00	5.00

5.2.5: Year5

Details of Work Proposed during the Year / Measures Planned for the Affected Segment	Cumulative Work done / Measures Taken
5.2.5.1: Area to be Developed for Recreation	
Area (Ha)	Area (Ha)
0.01	0.05

5.2.5.2: Area for Water Storage & Recharge Facility	
Area (Ha)	Area (Ha)
0.01	0.05

5.2.5.3: Efforts Made towards Housing for Local Communities	
Number of Houses	Number of Houses
2	11

5.2.5.4: Efforts Made towards Providing Transport to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
100	500

5.2.5.5: Efforts Made towards Providing Healthcare to Local Communities	
Number of Beneficiaries	Number of Beneficiaries
100	500

5.2.5.6: Efforts Made towards Providing Hygiene & Sanitation to Local Communities		
Number of Beneficiaries		Number of Beneficiaries
100		500
5.2.5.7: Efforts Made towards Skill Development Programs to Local Communities		
Number of Beneficiaries		Number of Beneficiaries
5		25
5.2.5.8: Efforts Made to Promote Education & Knowledge Based Initiatives		
Number of Beneficiaries		Number of Beneficiaries
5		25
5.2.5.9: Communication Facilities Provided to Local Communities		
Number of Beneficiaries		Number of Beneficiaries
100		500
5.2.5.10: Any Other Steps Taken for Improving the Socio-Economic Standard of Local Communities		
Number of Beneficiaries		Number of Beneficiaries
10		50
5.2.5.11: Adoption of ODF		
Number of Toilets Built inside the Lease Area	Number of Toilets Built outside the Lease Area:	Number of Beneficiaries
1	1	50
5.2.5.12: Awareness Program among Mine Workers for Swatchata		
Number of Swatchata Programmes Proposed		Number of Swatchata Programmes Held
1		4
5.2.5.13: Efforts for green energy		
Total energy consumption (KWh)		Green energy consumption (% of total)
200000.00		5.00

5.2.5.14: Water & recycled use	
Total water consumption (KLD)	Water recycled (% of total)
180.00	10.00

5.3: Rehabilitation & Resettlement of Affected Persons

Particular	Year1	Year2	Year3	Year4	Year5
Proposed Number of Project Affected Persons(PAP)	57	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	0	0	0	0
Proposed Number of Person Likely to get Direct Employment	0	0	0	0	0
Proposed Number of Person Likely to get Indirect Employment	0	0	0	0	0
Proposed Project Affected Families Skilled and Absorbed	0	0	0	0	0
Proposed Number of Project Affected Families	16	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 outArea fully Rehabilitated from Reclaimed area(in hect)	Area under Water Reservoir considered Rehabilitated (in hect)	Stabililized Waste dump Rehabilitated (in hect)	Virgin area under Green Belt (in hect)
Area under mining operation	Mined Out area in the lease								
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

6.2: Progressive Reclamation and Rehabilitation Plan

6.2.1: Backfilling

Quantity of Waste / Fill Material Available at Site (m³)	0.00
Availability of Top Soil for Spreading (m³)	0.00
Proposed Spread Area (m²)	0.00

6.2.1.1: Year Wise Proposal

SI.No	Year	Pit ID	Area (m²)	Top RL	Bottom RL	Estimated Expenditure (₹ INR)
1	Nil	0	0.00	0	0	0.00

6.2.2: Water Reservoir

Average Rainfall of The Area (mm)	1279.16
Proposed Area under Water Storage	0

6.2.2.1: Preparations For Ground Water Recharging

6.2.2.1.1: Drilling Holes			
Year		Proposed no of Holes to be Drilled	
Year1		0.00	
Year2		0.00	
Year3		0.00	
Year4		0.00	
Year5		0.00	

6.2.2.1.2:Preparation of Course Gravel Bed			
Year		Proposed Area of Bed (LxW)	
Year1		0	
Year2		0	
Year3		0	
Year4		0	
Year5		0	

Please specify, if others			
NIL			

6.2.2.2: Protective measures (Please specify running meter)

6.2.2.2.1: Fencing			
Year	Proposed Fencing Length (m)	Latitude(dd:mm:ss.ss)	Longitude(dd:mm:ss.ss)

		From	To	From	To
Year1	85	21:58:01.78	21:58:04.36	85:16:24.14	85:16:25.16
Year2	101	21:57:58.80	21:58:01.78	85:16:22.69	85:16:24.14
Year3	100	21:57:56.31	21:57:58.79	85:16:20.42	85:16:22.68
Year4	101	21:57:54.53	21:57:56.29	85:16:17.44	85:16:20.39
Year5	134	21:57:52.40	21:57:54.53	85:16:13.37	85:16:17.44

6.2.2.2.2: Retaining Wall					
Year	Proposed Wall Length (m)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
		From	To	From	To
Year1	102	21:58:01.94	21:58:05.04	85:16:24.29	85:16:25.23
Year2	102	21:58:05.01	21:58:07.73	85:16:24.92	85:16:24.96
Year3	103	21:58:07.73	21:58:08.83	85:16:20.21	85:16:23.05
Year4	103	21:58:05.62	21:58:08.08	85:16:18.71	85:16:20.24
Year5	103	21:58:05.63	21:58:07.65	85:16:11.95	85:16:14.23

6.2.2.2.3: Garland Drains					
Year	Proposed Bund Length (m)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)	
		From	To	From	To
Year1	105	21:58:01.91	21:58:05.08	85:16:24.38	85:16:25.32
Year2	102	21:58:05.08	21:58:07.78	85:16:24.99	85:16:25.04
Year3	107	21:58:07.73	21:58:08.91	85:16:20.17	85:16:23.12
Year4	107	21:58:05.58	21:58:08.15	85:16:18.51	85:16:20.02
Year5	108	21:58:05.67	21:58:07.76	85:16:11.09	85:16:14.31

6.2.3: Green Belt Development

6.2.3.1: Cumulative work done (upto end of previous block of five years)

SI.No	Total Expenditure Incurred up to Last Year (INR)	Area Covered (Ha)	Number of Plants	Survival Rate (%)
1	0.00	0.00	Nil	0.00

6.2.3.2: Year Wise Proposal

SI.No	Year	Green Belt Location (s)	Area Proposed to be Covered (Ha)	Number of Plants Proposed	Expected Survival Rate (%)	Estimated Expenditure (₹ INR)
1	Year1	0	0	Nil	0	0
2	Year2	0	0	Nil	0	0
3	Year3	2430188335N TO 24302908N 321693405E TO 3217396E	0.25	500	90	100000
4	Year4	2430870N TO 24303847N 321658303E TO 3217396E	0.25	500	90	100000
5	Year5	24303432N TO 24303847N 3215679E TO 321679525E	0.3	500	90	100000

6.2.4: Use of Shallow Pits

6.2.4.1: Cumulative Work Done (upto end of previous block of five years)

SI.No	Pit ID	Work Done	Area covered (m²)	Total Expenditure Incurred (up to last five year block) (₹ INR)
1	Nil	0	0.00	0.00

6.2.4.2: Year Wise Proposal

SI.No	Year	Pit ID	Total Area(Ha)	Area Proposed for Crops (Ha)	Suitable Crops	Area Proposed for Grass (Ha)	Total Proposed Expenditure (₹ INR)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)		Remarks
								From	To	From	To	
1	Nil	Nil	0.00	0.00	0	0.00	0.00	Nil	Nil	Nil	Nil	0

6.2.5: Pisciculture

6.2.5.1: Total Expenditure incurred as on Date (INR)	0
--	---

6.2.5.2: Cumulative work done as on Date

SI.No	Pit ID	Area (m ²)	Expenditure (₹ INR)
1	NOT APPLICABLE	Nil	Nil

6.2.5.3: Year Wise Proposal

SI.No	Year	Pit ID	Area (m ²)	Estimated Expenditure (₹ INR)
1	Year1	NOT APPLICABLE	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	Yes
---	-----

6.2.6: Recreational Facility

6.2.6.1: Total Expenditure Incurred (up to last five year block) (INR)	0.00
--	------

6.2.6.2: Cumulative work done as on Date

SI.No	Pit ID	Area (m ²)	Expenditure (₹ INR)
1	NOT APPLICABLE	Nil	Nil

6.2.6.3: Year Wise Proposal

SI.No	Year	Type of Recreational Facility	Area Covered (Ha)	Latitude (dd:mm:ss.ss)		Longitude (dd:mm:ss.ss)		Estimated Expenditure (INR)
				From	To	From	To	
1	Year1	Not applicable	0.00	Nil	Nil	Nil	Nil	0.00
2	Year2	Not applicable	0.00	Nil	Nil	Nil	Nil	0.00
3	Year3	Not applicable	0.00	Nil	Nil	Nil	Nil	0.00
4	Year4	Not applicable	0.00	Nil	Nil	Nil	Nil	0.00
5	Year5	Not applicable	0.00	Nil	Nil	Nil	Nil	0.00

6.2.7: Dump Area Stabilization & Development

SI.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	Year3	Dump1	1	10.00	100.00	100.00	0.25	Afforestation	600000.00	1
2	Year4	Dump1	1	10.00	100.00	100.00	0.25	Afforestation	600000.00	1

6.2.8: Other Form of Reclaiming the Area

6.2.8.1: Cumulative work done as on Date

SI.No	Total Expenditure incurred as on Date (INR)	Work Done
1	0.00	NIL

6.2.8.2: Year Wise Proposal

SI.No	Year	Work Proposals	Estimated Expenditure (INR)
1	Year1	NIL	0.00
2	Year2	NIL	0.00
3	Year3	NIL	0.00
4	Year4	NIL	0.00
5	Year5	NIL	0.00

6.2.9: TopSoil Management

6.2.9.1: Cumulative Work Done as on Date

SI.No	Top Soil Generated (m³)	Top Soil Utilized (m³)	Topsoil Stored (m³)	Total expenditure incurred as on date (₹)
1	0.00	0.00	0.00	0.00

6.2.9.2: Year Wise Proposal

SI.No	Year	Topsoil Generated (m³) (A)	Topsoil Utilized (m³) (B)	Topsoil Stored (m³) (A-B)	Estimated Expenditure (INR)
1	Year1	0.00	0.00	0.00	0.00
2	Year2	0.00	0.00	0.00	0.00
3	Year3	0.00	0.00	0.00	0.00
4	Year4	0.00	0.00	0.00	0.00
5	Year5	0.00	0.00	0.00	0.00

6.2.10: Tailings Dam Management

SI.No	Year	Yearly generation of Tailing (m³) (A)	Total capacity of Tailing Pond (m³)	Measures Proposed for Periodic Desilting	Yearly Utilization of Tailing (m³) (B)	Disposal of Tailing to Tailing Pond (m³) (A-B)	Tailing Dam Design	Structural Stability Studies
1	Year1	0.00	0.00	0	0.00	0.00	Nil	Nil
2	Year2	0.00	0.00	0	0.00	0.00	Nil	Nil
3	Year3	0.00	0.00	0	0.00	0.00	Nil	Nil
4	Year4	0.00	0.00	0	0.00	0.00	Nil	Nil
5	Year5	0.00	0.00	0	0.00	0.00	Nil	Nil

6.2.11: Land Use of Lease Area at the Expiry of Lease Period

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 outArea 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)
18.10	0.00	0.00	0.02	6.09	8.88	9.22	0.00	0.00	2.94	0.00	0.00

Chapter 7: Financial Assurance/ Performance Surety (AREA PUT TO USE)

Year1

Consolidated View of Financial Assurance

SI.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	0.00	4.12	4.12
2	Topsoil stacking	0.00	0.00	0.00
3	Overburden/Waste Dumping	0.00	2.63	2.63
4	Mineral Storage	0.00	6.00	6.00
5	Infrastructure (Workshop, Administrative Building etc.)	0.00	4.98	4.98
6	Roads	0.00	0.73	0.73
7	Railway	0.00	0.00	0.00
8	Tailing Pond	0.00	0.00	0.00
9	Effluent Treatment Plant	0.00	0.00	0.00
10	Mineral Separation Plant	0.00	0.00	0.00
11	Township Area	0.00	0.00	0.00
12	Others to specify	0.00	0.00	0.00
	Total	0.00	18.46	18.46

Year2

Consolidated View of Financial Assurance

SI.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	4.12	1.38	5.50
2	Topsoil stacking	0.00	0.00	0.00
3	Overburden/Waste Dumping	2.63	0.00	2.63
4	Mineral Storage	6.00	0.00	6.00
5	Infrastructure (Workshop, Administrative Building etc.)	4.98	-1.37	3.61
6	Roads	0.73	0.00	0.73
7	Railway	0.00	0.00	0.00
8	Tailing Pond	0.00	0.00	0.00
9	Effluent Treatment Plant	0.00	0.00	0.00
10	Mineral Separation Plant	0.00	0.00	0.00
11	Township Area	0.00	0.00	0.00
12	Others to specify	0.00	0.00	0.00
	Total	18.46	0.01	18.47

Year3

Consolidated View of Financial Assurance

SI.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	5.50	2.72	8.22
2	Topsoil stacking	0.00	0.00	0.00
3	Overburden/Waste Dumping	2.63	2.97	5.60
4	Mineral Storage	6.00	-3.24	2.76
5	Infrastructure (Workshop, Administrative Building etc.)	3.61	-2.40	1.21

6	Roads	0.73	0.00	0.73
7	Railway	0.00	0.00	0.00
8	Tailing Pond	0.00	0.00	0.00
9	Effluent Treatment Plant	0.00	0.00	0.00
10	Mineral Separation Plant	0.00	0.00	0.00
11	Township Area	0.00	0.00	0.00
12	Others to specify	0.00	0.00	0.00
	Total	18.47	0.05	18.52

Year4

Consolidated View of Financial Assurance

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	8.22	0.57	8.79
2	Topsoil stacking	0.00	0.00	0.00
3	Overburden/Waste Dumping	5.60	0.00	5.60
4	Mineral Storage	2.76	-0.31	2.45
5	Infrastructure (Workshop, Administrative Building etc.)	1.21	-0.14	1.07
6	Roads	0.73	-0.11	0.62
7	Railway	0.00	0.00	0.00
8	Tailing Pond	0.00	0.00	0.00
9	Effluent Treatment Plant	0.00	0.00	0.00
10	Mineral Separation Plant	0.00	0.00	0.00
11	Township Area	0.00	0.00	0.00
12	Others to specify	0.00	0.00	0.00
	Total	18.52	0.01	18.53

Year5

Consolidated View of Financial Assurance

SI.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	8.79	1.47	10.26
2	Topsoil stacking	0.00	0.00	0.00
3	Overburden/Waste Dumping	5.60	0.00	5.60
4	Mineral Storage	2.45	-0.95	1.50
5	Infrastructure (Workshop, Administrative Building etc.)	1.07	-0.30	0.77
6	Roads	0.62	-0.18	0.44
7	Railway	0.00	0.00	0.00
8	Tailing Pond	0.00	0.00	0.00
9	Effluent Treatment Plant	0.00	0.00	0.00
10	Mineral Separation Plant	0.00	0.00	0.00
11	Township Area	0.00	0.00	0.00
12	Others to specify	0.00	0.00	0.00
	Total	18.53	0.04	18.57
	Grand Total			18.57

Financial Assurance

Financial Assurance

Category A Mining Lease

Total Area Proposed to be put to use in	Amount of Bank Gurantee (Lac INR)	Valid till (dd/mm/yyyy)	Upload copy of Bank Gurantee as attachment
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hect(Year 1 to 5)			
18.57	92.85	Nil	172741762566f64d19cc558BG_undertaking26092024.pdf

Category B Mining Lease

SI.No	Total Area Proposed to be put to use in hect(Year 1 to 5)	Amount of Bank Gurantee (Lac INR)	Valid till (dd/mm/yyyy)	Upload copy of Bank Gurantee as attachment
1	Nil	Nil	Nil	Nil

Approved

Chapter 8 : Review of previous proposals during the last plan period (NA)

Approved

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)	Yes

Any Significant Objections from any Agency Involved in Stakeholder’s Consultation.

Village area falls within the Mining lease No significant objection

(Total 500 characters)

9.2: Environment Parameters

9.2.1: Environment Monitoring

Monitoring Activity

9.2.1.1: Ambient Air Quality

Core Zone (Quarterly Monitoring Planned)	Yes
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Buffer Zone (Quarterly Monitoring Planned)	Yes
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9.2.1.2: Water Quality

Core Zone (Quarterly Monitoring Planned)	Yes
Buffer Zone (Quarterly Monitoring Planned)	Yes

9.2.1.3: Noise Level

Core Zone (Quarterly Monitoring Planned)	Yes
Buffer Zone (Quarterly Monitoring Planned)	Yes

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	0.0000
Land under Agriculture / Crops	0.0000
Land covered with Plants	0.0000
Land under Grass Cover	0.0000
Land under Public Infrastructure / Utilities (water bodies, roads, railways, electric lines, telephone lines etc.)	3.3170

Land under Habitation	0.4144
Land under Monuments & places of Historical Importance	0.0000
Degraded by Pits & Excavation	0.0000
Degraded by Dumps & Material Staking	0.0000
Covered under Mine Infrastructure (plants, shades, buildings etc.)	0.0000
Land under Forest	24.2030
Historically, Culturally & Ecologically Important Places	0.0000
Any Other, please specify below	0.0000
Date of Observation	31/03/2024

9.3.2.2: ANTICIPATED IMPACT

Post Mining Use	AREA (Ha)
Degradation by Excavation	0.0000
Degradation by Dumps & Material Staking	0.0000
Covered under Plants, Shades & Buildings	0.0000
Covered by Roads & Approaches	1.6520
Any Other, please specify below	0.0000

9.3.2.3: MITIGATION MEASURES

9.3.2.3.1: Backfilling

Total waste generation up to the conceptual is 25,25,000 cum which will be backfilled upto a depth of 530mRL.

(Total 1000 characters)

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

0

(Total 1000 characters)

9.3.2.3.3: Proposed Area under Agriculture

0

(Total 1000 characters)

9.3.2.3.4: Proposed Area to be converted to Grazing Land

0

(Total 1000 characters)

9.3.2.3.5: Ground Water Recharging

0

(Total 1000 characters)

9.3.2.3.6: Green Belt Development

0

(Total 1000 characters)

9.3.2.3.7: Agriculture

0

(Total 1000 characters)

9.3.3: Air Environment

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

Temperature (°C)	
Maximum	33.60
Minimum	10.20
Relative Humidity (%)	
70.00	
Average Rainfall (mm)	
1279.16	

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

S.N.	Station Name	Season	PM10 (µg/m3)	PM10 Excess (µg/m3)2	PM2.5 (µg/m3)	PM2.5 Excess (µg/m3)2	SO2 Value (µg/m3)	SO2 Excess (µg/m3)	NOX Value (µg/m3)	NOX Excess (µg/m3)	Date of Observation	Action
1	NAAQ Standards	Monsoon	100.0000	0.0000	60.0000	0.0000	80.0000	0.0000	80.0000	0.0000	18/10/2021	Monitor
2	AAQ-1 At project site	Monsoon	70.5000	0.0000	39.6000	0.0000	12.0000	0.0000	21.3000	0.0000	21/10/2021	Monitor
3	AAQ-2 Nuagaon	Monsoon	72.8000	0.0000	40.8000	0.0000	11.2000	0.0000	20.3000	0.0000	22/10/2021	Monitor
4	AAQ-3 Nadihkashira	Monsoon	48.4000	0.0000	25.7000	0.0000	5.8000	0.0000	12.9000	0.0000	25/10/2021	Monitor
5	AAQ-4 Near Nilachal	Monsoon	71.0000	0.0000	39.7000	0.0000	13.5000	0.0000	22.9000	0.0000	26/10/2021	Monitor

	High School, Guali											
6	AAQ-5 Gandhalpa da near Forest area	Monsoon	60.2000	0.0000	33.1000	0.0000	10.4000	0.0000	17.6000	0.0000	27/10/2021	Monitor
7	AAQ-6 Gandhalpa da village area	Monsoon	66.4000	0.0000	36.4000	0.0000	11.1000	0.0000	19.6000	0.0000	28/10/2021	Monitor
8	AAQ-7 Tamaklasahi	Monsoon	63.9000	0.0000	34.6000	0.0000	10.1000	0.0000	18.9000	0.0000	29/10/2021	Monitor
9	AAQ-8 Rengalbeda	Monsoon	85.1000	0.0000	46.2000	0.0000	14.4000	0.0000	25.1000	0.0000	30/10/2021	Monitor

9.3.3.3: Impact Assessment & Mitigation Measures

9.3.3.3.1: Anticipated Impact

Give details on Prediction of fugitive dust emissions due to mining activities, crushing & cleaning plants, loading & unloading, transportation by rail, road or conveyor

The major dust generating sources include drilling, blasting, loading, wheel generated dust and wind erosion. Particulate emissions have been predicted by using standard equations given in “Determination of the emission rate from various opencast mining operations M.K.Chakraborty, M.Ahmad, R.S.Singh, D.Pal, C.Bandopadhyay, S.K.Chaulya Central Mining Research Institute, Barwa Road, Dhanbad.”

(Total 1000 characters)

9.3.3.3.2: 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

Dust is the main air pollutant generated from the mining. The nature of mining operations is such that complete elimination of dust from mining process would not be possible. However, some preventive measures i.e. control at source like provision of dust collectors, dust suppression during the course of Final EIA/EMP Report for production of 2.0 MTPA Iron Ore at Rengalbeda (NE)

Iron Ore Block of OMECL over M.L area of 24.203 Ha within the Village limits of Nuagaon & Gandhalpada under Barbil Tehsil, District – Keonjhar, Odisha Page | 198 various mining operations, shall be resorted to minimize fugitive dust emission ☐ Mixing of dust palliatives like Calcium Chloride/Magnesium Chloride or DGMS approved dust bond chemicals like Filset-50, Pulver Bond etc. in sprinkling water for effective dust suppression. ☐ Compaction & gradation and drainage on both sides of haul roads ☐ Proper maintenance of transport vehicles ☐ Avoiding overloading and enforcing speed limit on dumpers

(Total 1000 characters)

9.3.4: Water Environment

9.3.4.1: RAIN WATER

9.3.4.1.1: Base / Present Status

(Details of Rivers, Springs, Lakes, Reservoirs & Drains up to First Order in Study Area)

No river or perennial surface water bodies passes through the lease area However few rainwater drainage channels are passing through the lease area The study area consist of Karo Nadi NW Suna Nadi SE There are minor tributary of Karo Nadi is Topadihi Nala NE and of Suna Nadi is Kakarpani Nala E As well as Samlj Nala flows in Western parts of study area Total area covered is about 013

(Total 1000 characters)

9.3.4.1.2: Anticipated Impact

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

No river or perennial surface water bodies passes through the lease area However few rainwater drainage channels are passing through the lease area

(Total 1000 characters)

9.3.4.1.3: Mitigation Measure

(Possibilities of Rain Water Harvesting & Artificial Recharge with in the Mining Lease)

No river or perennial surface water bodies passes through the lease area However few rainwater drainage channels are passing through the lease area It will be properly connected to the garland drains

(Total 1000 characters)

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)

No river or perennial surface water bodies passes through the lease area However few rainwater drainage channels are passing through the lease area. The region will be mostly occupied by mine pit and run-off generated can be stored at pit bottom. Pit has huge area to store the surface run-off generated in the region. Run off generated from this region will be channelized to proposed mine pit, which has sufficient area to accommodate. A settling pit of 10x5x3 m is required to accommodate the run-off generated from OB dump in this region.

(Total 1000 characters)

9.3.4.2.2: Anticipated Impact

(Ingress of Sea Water, Particularly for Mining Projects in Coastal Areas)

Not applicable

(Total 1000 characters)

9.3.4.2.3: Mitigation Measure

(Steps to Minimize Impact on Water Table if Mining Intercepts Groundwater Regime)

The overall drainage planning should be done in such a manner that the existing pre-mining drainage conditions will be maintained to the extent possible so that run off distribution is not affected. Garland drains will be constructed on all side of quarries and external dumps. All the garland drains will be routed through adequately sized catchpits or settling pits to remove suspended solids from flowing into storm water. Retaining walls with weep holes will be built all around the dumps. The storm water should pass through weep holes to the garland drains. Rainwater harvesting by constructing nallah and developing water bodies will be planned for recharging groundwater in the vicinity. Shallow and deeper piezometers will be constructed close to mine area for monitoring the water levels in the aquifer. The location of piezometers will be selected in consultation with Ground water Authority. Stone barriers across the drain will be constructed to check the water current and arrest solids. Stone pitching will be made at suitable location to regulate water flow and prevent soil erosion. Settling pits and drains will be periodically desilted.

(Total 1000 characters)

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)

Total Water Withdrawal 180 KLD Surface Water 95 KLD Mine Seepage 25 KLD Ground water 85 KLD Wheel Washing and HEMM Cooling 20 KLD Dust Suppression 60 KLD

(Total 1000 characters)

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, & Leach ate from Solid Waste Dumps etc)

The downward movement of the toxic substances from the stacks dump and exposed quarry faces during seepage and percolation of ground water

(Total 1000 characters)

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 region is mostly occupied by mine pit and runoff generated can be stored at pit bottom Pit has huge area to store the surface runoff generated in the region A settling pit of 20x10x3 m is required to accommodate the runoff in this region Run off generated from this region will be channelized to proposed mine pit which has sufficient area to accommodate A settling pit of 10x5x3m is required to accommodate the runoff generated from OB dump in this region Garland drains of 1 m deep and 15 m wide shall be constructed all along the bottom periphery of waste dumps followed by the retaining wall to prevent any wash off or leaching of dump materials during heavy rains A series of 3 settling pits along bottom of the dump of 10 m length 10 m width and 3 depth will be provided to arrest the wash off solid particles The settling pit will be provided with two compartments each of around 5 m width to arrest the suspended solids These pits will serve for recharge of water through natural percolation method It is also proposed to construct the rainwater harvesting structures in the study area in consultation with local authority for the sustainability of ground water resource of the area The overall drainage planning should be done in such a manner that the existing premining drainage conditions will be maintained to the extent possible so that run off distribution is not affected Garland drains will be constructed on all side of quarries and external dumps All the garland drains will be routed through adequately sized catchpits or settling pits to remove suspended solids from flowing into storm water Retaining walls with weep holes will be built all around the dumps The storm water should pass through weep holes to the garland drains Rainwater harvesting by constructing nallah and developing water bodies will be planned for recharging groundwater in the vicinity Shallow and deeper piezometers will be constructed close to mine area

(Total 1000 characters)

9.3.5: Noise

9.3.5.1: Critical Locations Identified within Lease Area

Mining machinery like drills, excavators, dozers, etc. and dumpers used for mineral transport generate noise in the working areas and along transport route. Excavator 2 Nos 2. Loaders 2 Nos 3.Long Hole drill 2 Nos. 4. Dumpers 19 Nos. 5. Dozer 1 Nos. 6. Rock breaker 1 Nos. 7. Road grader 1 Nos 8. Water Sprinkler 1 Nos. 9. Diesel tanker 1 Nos. 10. Compressor 2 Nos 11. Mobile Crusher & Screen 1

(Total 1000 characters)

9.3.5.2: Give Detail About Prediction of Noise Level by using Mathematical Modeling at Different Locations Identified

Predictions have been carried out to compute the noise level at various distances around the mine lease area due to these major noise-generating sources. ‘DHWANI’ Noise Modelling Software was used to predict the ambient noise levels around the mine lease boundary. Basic phenomenon of the model is the geometric attenuation of sound. Noise at a point generates spherical waves, which are propagated outwards from the source through the air at a speed of 1,100 ft/sec, with the first wave making an ever-increasing sphere with time. As the wave spreads the intensity of noise diminishes as the fixed amount of energy is spread over an increasing surface area of the sphere. The assumption of the model is based on point source relationship i.e., for every doubling of the distance the noise levels are decreased by 6 dB(A). Point source propagation is defined by the following equation: $L_2 = L_1 - 20 \log_{10} (R_2/R_1)$ -----(1) Where L_1 dB(A) = Noise level at a distance R_1 (m) L_2 dB(A) = Noise level at a distance R_2 (m) The summation of different resultant noise levels at receptors is carried out by mathematical equation No. 2 as given below:
$$L = 10 \log_{10}(10^{L_1/10} + 10^{L_2/10} + \dots + 10^{L_n/10})$$
 -----(2 Where L_1 , L_2 and L_n are noise level dB(A)

(Total 1000 characters)

9.3.5.3: Measures to Minimize the Impact on Receiving Environment

☐ Prime movers/diesel engines will be properly maintained; ☐ Development of thick green belt along the mine lease boundary to attenuate noise; ☐ Development of thick green belt comprising of alternate rows of tall growing trees & small trees with dense foliage cover along the NH 215 passing through the mine lease area. ☐ Personal Protective Equipment (PPE) like ear muffs/ear plugs will be provided to the operators of HEMM and persons working near HEMM producing high levels of noise will be made; and ☐ Exposure time of workers to the higher noise levels would be minimized. ☐ Isolation/enclosure of noisy machines/equipment, wherever possible. ☐ Reducing idling time of machines/equipments. ☐ Provision of enclosures, silencers, etc to the possible extent to control noise propagation. ☐ Use of adequate silencers and practicing speed limit for material transport vehicles ☐ Periodic maintenance of road used for mineral transport ☐ Development of thick green belt along mineral transport road near habitations ☐ Periodic monitoring of work zone noise levels and ambient noise levels in the mine lease area and in nearby villages to assess the efficacy of noise control measures and adoption of additional noise control measures, if required.

(Total 1000 characters)

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	Commerical Area	65	55
C	Residential Area	55	45
D	Silence Area	40	50

Note :

1. Day time reckoned in between 6.00 am to 9.00p.m

2. Night time reckoned in between 9.00p.m.to 6:00am
3. Silence zone is defined as areas up to 100 meter around such premises as Hospitals, Educational institutes and Courts. The Silence zones are to be declared by the competent Authority
4. Mixed categories of areas should be declared as "one of the four above mentioned categories" by the Competent Authority and the corresponding standards shall be applied.

S.N.	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	ANQ 1	Winter	Industrial	49.8	0	45.1	0	19/11/2021
2	ANQ 2	Winter	Industrial	55.5	0	50.2	0	22/11/2021
3	ANQ 3	Winter	Industrial	50.5	0	41.5	0	23/11/2021
4	ANQ 4	Winter	Industrial	55.6	0	41.4	0	24/11/2021
5	ANQ 5	Winter	Industrial	49.4	0	36.2	0	25/11/2021
6	ANQ 6	Winter	Industrial	61.3	0	51.2	0	26/11/2021
7	ANQ 7	Winter	Industrial	51.7	0	40.0	0	29/11/2021
8	ANQ 8	Winter	Industrial	55	0	40.4	0	30/11/2021

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

During the mine operation noise is generated from various mining machinery and transport vehicles With increasing distance from the source the noise level decreases due to wave divergence Additional decrease also occurs due to atmospheric effects and interaction with objects in the transmission paths Machinery equipment proposed to be deployed in mining complex are used as input as noise generating sources Noise generation is assumed 1 m above ground and spreading on a flat terrain devoid of any barriers Noise attenuation effects due to barriers like undulating topography shrubs bushes and trees mine benches and dumps absorption by air wind temperature and humidity were not considered for modeling hence the values depict worst case scenario The noise level will remain well within the prescribed CPCB standards and thus the impact of the project operation on the ambient noise level of study area will be insignificant

(Total 1000 characters)

9.3.5.5.2: Mitigation Measure

Give details on measures for noise abatement including point source & line source

Prime movers diesel engines will be properly maintained Development of thick green belt along the mine lease boundary to attenuate noise Development of thick green belt comprising of alternate rows of tall growing trees small trees with dense foliage cover along the NH 215 passing through the mine lease area Personal Protective Equipment PPE like ear muffsear plugs will be provided to the operators of HEMM and persons working near HEMM producing high levels of noise will be made and Exposure time of workers to the higher noise levels would be minimized Isolation enclosure of noisy machines equipment wherever possible Reducing idling time of machines equipments Provision of enclosures silencers etc to the possible extent to control noise propagation Use of adequate silencers and practicing speed limit for material transport vehicles Periodic maintenance of road used for mineral transport Development of thick green belt along mineral transport road near habitations Periodic monitoring of work zone noise levels and ambient noise levels in the mine lease area and in nearby villages to assess the efficacy of noise control measures and adoption of additional noise control measures if required

(Total 1000 characters)

9.3.6: VIBRATION

9.3.6.1: Vibration Details for Base / Present Status

S.N.	Station Name	Season	Distance from the Blasting Site (m)	Peak Particle Velocity (mm/s)	Air Over Pressure (DB)	Frequency (Hz)	Date of Observation
1	Nil	Nil	Nil	Nil	Nil	Nil	Nil

9.3.6.2: Impact Assessment & Mitigation Measures

9.3.6.2.1: Anticipated Impact

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

No such damage is envisaged

(Total 1000 characters)

9.3.6.2.2: Mitigation Measure

Give details on measures for noise abatement including point source & line source

Posting of sentries on the NH 215 road passing through the lease area and stopping of traffic beyond safety barrier before conducting blasting Only after completion of blasting the traffic movement shall be continued Charge per delay will be minimized and preferably more number of delays will be used per blast Systematic blasting with proper spacing burden and stemming will be carried out Blasting will be carried out during favorable atmospheric conditions and also when human activities are at their minimum Proper design of blast based on the site conditions to control fly rocks Blasting operations will be carried out only during day time as per mine safety guidelines During blasting other activities in the immediate vicinity will be temporarily stopped Secondary blasting will be minimized to the extent possible by use of rock breaker Clearance of loose boulders from benches to avoid rolling boulders after blasting Regular monitoring of ground

vibration will be done Permission and guidelines under regulation 106 2b of the Metalliferous Mine Regulations 1961 in conjunction with deep hole blasting are mentioned below Drilling charging stemming and blasting activities shall be placed under assistant manager holding at least 2nd class mine managers competency certificate Proper record shall be maintained for all blasting parameter ie spacing burden depth of hole no of holes fired per round delay sequences The danger zone shall be distinctly demarcated by means of red flags or other suitable means at least 30minutes before firing of holes A danger zone of 500m will be marked 30 minutes before firing

(Total 1000 characters)

9.3.7: Socio-Economic Environment

9.3.7.1: Demographic Profile

S.N.	Type of Area	Name of Village	Total Population	Male to Female Ratio	Literacy Rate (%)	Employment Rate (%)
1	Residential	Kendudihi	64800.00	0.981	53.67	30.12
2	Residential	Paduliposi	588.00	1.013	53.67	31.32
3	Residential	Nuagaon	977.00	1.092	53.67	30.46
4	Residential	Gandhalpada	602.00	0.96	53.67	32.46
5	Residential	Guali	1740.00	1.570	53.67	33.46
6	Residential	Kolhapandoli	280.00	1	53.67	32.52
7	Residential	Barpada	651.00	1.015	53.67	31.23
8	Residential	Kolharodkala	473.00	0.938	53.67	30.47
9	Residential	Bhuyanrodkaala	412.00	1.112	53.67	32.00
10	Residential	Topadihi	1042.00	1.699	53.67	34.87
11	Residential	Laidapada	1393.00	1.439	53.67	32.50
12	Residential	Rugudihi	648.00	1.044	53.67	32.30
13	Residential	Nadikasira	541.00	1.155	53.67	35.20
14	Residential	Rengalbeda	628.00	1.136	53.67	31.85
15	Residential	Segasahi	271.00	0.831	53.67	32.66
16	Residential	Ghodabudani	167.00	0.964	53.67	33.25
17	Residential	Adaghat	462.00	1.035	53.67	31.23

18	Residential	Kalmanga	1290.00	0.966	53.67	35.63
19	Residential	Malda	564.00	1.112	53.67	32.53
20	Residential	Jhirpani	1000.00	0.960	53.67	30.00
21	Residential	Kalta	2532.00	1.197	53.67	30.78
22	Residential	Kasira	1280.00	0.831	53.67	31.00
23	Residential	Kusumdihi	858.00	0.954	53.67	31.58
24	Residential	Kamanda	1081.00	1.062	53.67	32.33
25	Residential	Harischandrapur	944.00	1.038	53.67	31.41
26	Residential	Bhanjapali	803.00	0.871	53.67	35.88
27	Residential	Badindipur	548.00	1.075	53.67	34.78
28	Residential	Sanindipur	786.00	1.112	53.67	31.55
29	Residential	Rusiberna	0.00	0	53.67	32.55
30	Residential	Gidei	226.00	0.915	53.67	31.56
31	Residential	Deoghar	223.00	1.144	53.67	31.55
32	Residential	Kenaveta	124.00	1.296	53.67	33.66
33	Residential	Patbeda	145.00	1.196	53.67	31.62
34	Residential	Ganua	1617.00	1.028	53.67	34.78
35	Residential	Dalita	69.00	0.916	53.67	31.40
36	Residential	Manda joda	191.00	0.872	53.67	31.85
37	Residential	Basada	153.00	0.912	53.67	32.55
38	Residential	Sanrusiberna	0.00	0	53.67	33.10
39	Residential	Sanaputuli	894.00	1.008	53.67	33.56
40	Residential	Ranisal	287.00	1.110	53.67	34.22
41	Residential	Sanua	338.00	0.953	53.67	30.22
42	Residential	Teherei	754.00	0.816	53.67	33.60
43	Residential	Nuagaon	440.00	1.027	53.67	31.88

44	Residential	Koida CT	6763.00	1.222	53.67	34.85
45	Residential	Kolhabarapada	1729.00	1.022	53.67	34.26
46	Residential	Camp of Tisco	0.00	0	53.67	31.99
47	Residential	Lotapani	176.00	0.852	53.67	30.10
48	Residential	Gamulai	264.00	1.046	53.67	31.11
49	Residential	Kanarda	397.00	0.946	53.67	31.23
50	Residential	Gandharpur	170.00	0.888	53.67	30.20
51	Residential	Lasarda	791.00	0.982	53.67	30.80
52	Residential	Kiruburu	1769.00	1.061	53.67	31.89
53	Residential	Dhanurjayapur	1535.00	0.998	53.67	33.60
54	Residential	Ketesahi	524.00	0.992	53.67	35.88
55	Residential	Bhuyanraida	1311.00	1.001	53.67	34.12
56	Residential	Kundurupani	486.00	1.050	53.67	33.12
57	Residential	Chormalda	565.00	1.108	53.67	33.60
58	Residential	Kadalibari	0.00	0	53.67	32.45
59	Residential	Meghahatuburu Forest Village	5992.00	1.110	53.67	31.80
60	Residential	Kiriburu	9372.00	1.077	53.67	30.76
61	Residential	Karampada	1406.00	1.411	53.67	31.23
62	Residential	Nawagaon	297.00	1.006	53.67	32.88
63	Residential	Bhangaon	814.00	1	53.67	31.60
64	Residential	Sarglgarh	738.00	0.926	53.67	35.40

9.3.7.1.1: Anticipated Impact

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

Not applicable.

(Total 1000 characters)

9.3.7.1.2: Mitigation Measure

(Give details about compensation for loss of land & crops)

Not applicable.

(Total 1000 characters)

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)

These families residing within the mining lease area are all encroachers over the Govt Forest land and no forest rights have been settled in their favour. But these families have constructed their houses since long in the forest land and depend on the nearby forest for their livelihood. However, these encroacher original households 13 Nos. in village Nuagaon are required to be displaced from the mining lease area are treated as Project Displaced Families (PDFs)although do not come under the definition of displaced families. Moreover, they all belong to Scheduled Tribe community as per the survey.

(Total 1000 characters)

9.3.7.2.2: Anticipated Impact

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

☑ No loss of existing livelihoods. Direct or indirect employment is expected to occur. ☑ Additional non-agricultural livelihood opportunities are expected both directly and as spinoffs. ☑ Most of the worker are employed from local areas only ☑ Implementation of Odisha Livelihood Misson/Mission Shakti/Odisha Millets Programme will sustain the livelihood aspects

(Total 1000 characters)

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)

☑ No loss of existing livelihoods. Direct or indirect employment is expected to occur. ☑ Additional non-agricultural livelihood opportunities are expected both directly and as spinoffs. ☑ Most of the worker are employed from local areas only ☑ Implementation of Odisha Livelihood Misson/Mission Shakti/Odisha Millets Programme will sustain the livelihood aspects

(Total 1000 characters)

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)

As many as 544 persons of different categories are available for work in these two villages out of which 82 are unskilled people 10 are skilled persons and barely 5 are untrained personnel

(Total 1000 characters)

9.3.7.3.2: Anticipated Impact

(Give details about impact on community resources such as grazing land)

There will be no impact on the socio economic conditions of people due to mining

(Total 1000 characters)

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)

Improvement of incomes of locals engaged in tertiary businesses by an average 10 to 15 percent through induced spending The expansion of the mining may attract more industrial investments which in turn will benefit the community

(Total 1000 characters)

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 are16 House Holds in Nuagaon village which are coming under Project Displaced Families and including the extended families within the core zone

(Total 1000 characters)

9.3.7.4.2: Anticipated Impact

(Give details about any displacement of human settlements during the life of the mine)

16 families in village Nuagaon are project affected and project displaced families

(Total 1000 characters)

9.3.7.4.3: Mitigation Measure

(Give details about rehabilitation & resettlement of land ousters & displaced people)

Suitable Resettlement and Rehabilitation of affected families will be done prior to mining

(Total 1000 characters)

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)

All 13 families in the village Nuagaon suffer from diseases during last one year No families have suffered from chronic diseases and majority of them have taken treatment from Government Hospitals

(Total 1000 characters)

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)

Health of people residing in buffer zone Study area is not likely to be impacted adversely considering the nature of emissions and the state of the art Emission control systems planned

(Total 1000 characters)

9.3.7.5.3: Mitigation Measure

(Give details about avenues like dispensaries, hospitals, maternity homes if any to be created)

Health of people residing in buffer zone Study area is not likely to be impacted adversely considering the nature of emissions and the state of the art Emission control systems planned

(Total 1000 characters)

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)

No such cases

(Total 1000 characters)

9.3.7.6.2: Anticipated Impact

(Give details about risk profiling)

Not applicable

(Total 1000 characters)

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.)

Not applicable

(Total 1000 characters)

Chapter 10: Annexures

1. Upload Document

1.1 Upload Document

Sl.No.	Title	Is Upload	Document (only pdf allowed)
1	Letter of Intent /Letter of lease grant	Nil	LOI Leasetransfer.pdf
2	Copy of lease deed executed	Nil	Nil
3	Copy of Declaration of Owner/Nominated Owner in case of Company/partnership firm	Nil	Appointment of Nominated owner.pdf
4	ID & Address Proof of Owner/ Nominated Owner	Nil	Address proof of Nominated Owner.pdf
5	Copy of Environment and Forest Clearence, Consent to Establish, Consent to Operate	Nil	Water Balance.pdf
6	Copy of Registration of Company (RoC)/Partnership firm (Registration) & Deed	Nil	Certificate of incorporation.pdf
7	Consent letter for Qualified Person	Nil	Consent letter for qualified Person Rengalbeda.pdf
8	Experience & Qualification Details of Qualified Person	Nil	Experience & Qualification Details of Qualified Person.pdf
9	Certificate from QP	Nil	QP Certificate of Rengalbeda.pdf
10	Copy of Bank Guarantee	Nil	BG undertaking26092024.pdf
11	Copy of Performance Surety	Nil	Minor mineral utilisation.pdf
12	Copy of MDPA (as applicable)	Nil	Nil
13	Exploration details	Nil	13 Exploration detail.pdf
14	Copy of feasibility Report	Nil	Pre Feasibility report.pdf

15	Copy of Study reports conducted as per Para 4.3.1	Nil	Undertaking_various_study.pdf
16	Chemical and Mineralogical analysis report	Nil	Chemical analysis Reserve grade back calculation HLO HGO LGO.pdf
17	Any other Report or Certification as required in the submitted Document.	Nil	Geological_report_Rengalbeda.pdf
18	Copy of Scale relaxation approval granted(if applicable)	No	Nil
19	Mineral processing flowsheet with stage wise recovery	Nil	Material_balance_Rengalbeda.pdf
20	Any Other (1)	Yes	Yearwise_Productionsheet.pdf
21	Any Other (2)	Yes	Environment_Base_Report.pdf

Chapter 11: Plates (OC)

1. Upload Document

1.1 Upload Document

S.N.	Title	Is Upload	Document
1	Lease sketch plan;	Nil	KEY_PLAN.pdf
2	Surface Plan (.KMZ format)(Georeferenced); A statutory plan as per MCDR, 2017. The Plan should be submitted showing different color codes for:(1) Active Pits & Excavation area(2) Excavated area reclaimed & rehabilitated (3)Active dumps (4) Stabilized & rehabilitated dump area , (5) Green belt (6) Mineral Stacks (7) Utilities such as plant, buildings etc (8) Lease boundary along with other details.)	Nil	Rengalbeda_Surface_Plan_(1).kmz
3	Surface Geological Plan of the lease (.KMZ format)(Georeferenced); The Plan should be submitted showing different color codes for : (1) Lithological/Geological Occurance (2) Area under G1,G2,G3 & G4 (3) Active pits & Excavation area (4) Dump Area (5) Mineral Stacks (6) Lease boundary along with other details.)	Nil	Geological_Plan_.kmz
4	Surface Geological sections (in Pdf format); Geological sections with different color coding depicting all the features shown in Surface Geological Plan.)	Nil	GEOLOGICAL_SECTION_-Model.pdf
5	Five year Production and Development plan (.KMZ format)(Georeferenced); The Plan should be submitted showing different color coding for: (1) Active Pit and Excavation area ,	Nil	Yearwise_DevelopmentPlan_(1).kmz

	(2) Year wise excavation proposal for year I to V (3) Active dump and yearwise dump proposal for year I to V (4) Year wise Dump working proposal for year I to V (6) Lease boundary (with reference to chapter 4) along with other details.)		
6	Five year Production and Development sections (in pdf fromat); Year wise excavation and dumping proposals with different color coding depicting all the features as shown in the Five year Production and development plan.)	Nil	DEVELOPMENT_SECTION.pdf
7	Progressive Mine Closure Plan (.KMZ format)(Georeferenced); The Plan should be submitted showing different color coding for : (1) Yearwise excavated area Reclaimed & rehabilitated for year I to V (2) Year wise dump area to be stabilized and dump area to be rehabilitatd for year I to V (3) Year wise Green area proposed from year I to V.(4) Any other reclamation and rehabilitation measures proposed.(5) Lease boundary (with reference to chapter 6) along with other details.)	Nil	PMCP_(3).kmz
8	Progressive mine Closure sections (in pdf format); Year wise Progressive mine clouser sections showing all the yearwise reclamation, rehabilitaion proposals as depicted in the Progessive mine clouser plan.)	Nil	PMCP_SECTION.pdf
9	Conceptual Plan (.KMZ format)(Georeferenced); The Plan should depict the staus of lease area as envisaged at the end of life of Mine showing all the details. Status of land use shall be depicted by different color coding.)	Nil	Conceptual_Plan.kmz
10	Conceptual Sections (pdf) format;	Nil	CONCEPTUAL_SECTION.pdf
11	Geo referenced Cadastral Plan; Duly certified by the State Government)	Nil	DGPS_RENGALBEDA_compressed.pdf
12	Financial Assurance Plan (KMZ);	Nil	FA_Plan_(6).kmz

13	Environmental Plan (.KMZ format)(Georeferenced); As per MCDR, 2017 indicating all the details.)	Nil	Rengalbeda_Environmental_Plan_(1).kmz
14	Any other plan/section as deemed necessary by approving authority;	No	Nil
15	Five Year Production and Development sections (in pdf format);	Yes	DEVELOPMENT_SECTION.pdf
16	LEVEL WISE SLICE PLAN; LEVEL WISE SLICE PLAN (PDF FORMAT IN VISIBLE SCALE))	No	Nil
17	Zipped shp file of the lease boundary; Upload a single zipped file of the lease boundary)	Nil	ML_bnd.zip
18	Zipped shp file of the boundary pillars; Enter a single zipped file of the boundary pillars.)	Nil	ML_Pillar_Rengalbeda.zip
19	Zipped shp file of the Production and Development plan for respective proposal year - Year1; Upload a zipped shape file indicating a separate production and development plan for each respective proposal year)	Nil	1styr.zip
20	Zipped shp file of the Production and Development plan for respective proposal year - Year2; Upload a zipped shape file indicating a separate production and development plan for each respective proposal year)	Nil	2ndyr.zip
21	Zipped shp file of the Production and Development plan for respective proposal year - Year3; Upload a zipped shape file indicating a separate production and development plan for each respective proposal year)	Nil	3rdyr.zip
22	Zipped shp file of the Production and Development plan for respective proposal year - Year4; Upload a zipped shape file indicating a separate production and development plan for each respective proposal year)	Nil	4thyr.zip
23	Zipped shp file of the Production and	Nil	5thyr.zip

	Development plan for respective proposal year - Year5; Upload a zipped shape file indicating a separate production and development plan for each respective proposal year)		
24	Zipped shp file of the Dump plan for respective proposal year - Year1; Upload zipped file of the dump plan separately for each respective proposal year)	Nil	1styr_Dump.zip
25	Zipped shp file of the Dump plan for respective proposal year - Year2; Upload zipped file of the dump plan separately for each respective proposal year)	Nil	2ndyr_Dump.zip
26	Zipped shp file of the Dump plan for respective proposal year - Year3; Upload zipped file of the dump plan separately for each respective proposal year)	Nil	3rdyr_Dump.zip
27	Zipped shp file of the Dump plan for respective proposal year - Year4; Upload zipped file of the dump plan separately for each respective proposal year)	Nil	4thyr_Dump.zip
28	Zipped shp file of the Dump plan for respective proposal year - Year5; Upload zipped file of the dump plan separately for each respective proposal year)	Nil	5thyr_Dump.zip

Chapter 11 : Plates(UG) : NA

Approved