

**INDIAN BUREAU OF MINES
MINERALS DEVELOPEMMENT AND REGULATION DIVISION**

MCDR INSPECTION REPORT

Goa regional office

Mine file No : GOA/FE/52/5

Mine code : 30GOA01243

- (i) Name of the Inspecting : **J003**) **JANGID G K**
Officer and ID No.
- (ii) Designation : Deputy Controller Mines
- (iii) Accompanying mine : Shri Santosh Mandreakar, Mines Manager
Official with
Designation
- (iv) Date of Inspection : 30/05/2016
- (v) Prev.inspection date :

PART-I : GENERAL INFORMATION

1. (a) **Mine Name** : **MANDOORBAGA**
- (b) **Registration NO.** : **IBM/449/2011**
- (c) Category : A Fully Mechanised
- (d) Type of Working : Opencast
- (e) Postal address :
State : GOA
District : NORTH GOA
Village :
Taluka :
Post office :
Pin Code :
FAX No. : 0832-2460612
E-mail : kishore.kumar@vedanta.co.in
Phone : 0832-2460601
- (f) Police Station : BICHOLIM
- (g) First opening date : 20/08/1941
- (h) Weekly day of rest : SUN
2. Address for : AT/P.O./TQ: BICHOLIM
correspondance : DIST: NORTH GOA
3. (a) Lease Number :
(b) Lease area :
(c) Period of lease :
(d) Date of Expiry :
4. Mineral worked : IRON ORE Main

5. Name and Address of the

Lessee : SESA MINING CORPORATION LTD
 SESA GHOR 20,EDC
 COMPLEX,PATTO PANAJIM NORTH
 GOA GOA
 Phone:083-6414859
 FAX :

Owner : KISHORE KUMAR RAJGOPAL
 Sesa Mining Corporation
 Ltd. Sesa Ghor, 20 EDC
 Complex, Patto-Panaji, Goa
 NORTH GOA GOA
 Phone: 0832-2460601
 FAX : 0832-2460612

Agent : SAUVICK MAJUMDAR
 M/s V. S. DEMPO & CO. PVT.
 LTD DEMPO HOUSE, PANAJI GOA
 NORTH GOA GOA
 Phone:
 FAX :

Mining Engineer
 Name : SHRISHAILAGOUDA SANKANAGOUDAR,Full Time
 Qualification : B. Tech (Mining) with FCC
 Appointment/ : 10/05/2015
 Termination date

Geologist
 Name : MAHESHWAR M.KINNAL,Full Time
 Qualification : M.SC (GEOLOGIST)
 Appointment/ : 01/04/2003
 Termination date

Manager
 Name : SANTOSH MANDREKAR
 Qualification : Diploma in Mining with FCC
 Appointment/ : 07/08/2015
 Termination date

6. Date of approval of Mining Plan/Scheme of Mining	:	Renewal under rule 24 MCR1960	08/04/2008
		Modif.of approved Mining Plan	26/08/2010
		MP modif under MCR 1960	07/10/2015

PART - II : OBSERVATION/COMMENTS OF INSPECTING OFFICERS

Exploration :

Sl.No.	Item	Proposals	Actual work	Remarks
1a	Backlog of previous year	Nil, Mining operations were temporary closed as per Supreme Court Order in WP 435/2012.	Nil	
1b	Exploration over lease area for geological axis 1 or 2	Additional exploration was not proposed in modified mining plan.	Additional exploration is not carried out after re-commencement of mining operations in September 2015. Area explored under G-1 category. Total 212 boreholes were drilled with 21944m drilling.	
1c	Exploration Agencies and Expenditure in lakh rupees during the year	Own drilling and/or contract drilling machines were used for exploration in the past.	Total 60 were drilled using diamond drill rigs and 152 holes were drilled using conventional drilling machines. Total Rs. 70.20 lacs was spent on exploration.	
1d	Balance area to be explored to bring Geological axis in 1 or 2	Exploration was carried out at 50m X 50m grid interval. Additional exploration was not proposed.	Exploration was carried out at 50m X 50m grid interval. Mulgao village is located in North part of lease area and NE part of lease over 13ha area has to be explored for availability of ore.	
1e	Balance reserve as on 01/04/20	Reserves as on 01.04.2015 were 16.256 million tonnes under 111, 3.701 million tonnes under 211, 331, 333 category.	Reserves as on 01.04.2015 were 16.256 million tonnes under 111, 3.701 million tonnes under 211, 331, 333 category as per modified mining plan dated 07.10.2015.	
1f	General remarks of inspecting officers on geology, exploration etc	Nil	Nil	

Development :

Sl.No.	Item	Propasals	Actual work	Remarks
2a	Location of development w.r.t.lease area	Proposal was to develop 5 Top pit on common boundary with TC 04/49 in southern part of lease area.	The working was observed in 5 Top pit in southern part of lease area; however common benches working with TC 04/49 could not been carried out during 2015-16 due to pending EC clearance of TC 04/49.	
2b	Separate benches in topsoil, overburden and minerals (Rule 15)	Topsoil is not present in area. Separate benches in waste and ore are planned in 5 top pit.	Topsoil is not present in area. Separate benches in waste and ore are developed.	
2c	Stripping ratio or ore to OB ratio	Planned Ore to OB ratio is 0.198.	Actual Ore to OB ratio is 0.258.	
2d	Quantity of topsoil generation in m3	Nil	Nil	
2e	Quantity of overburden generation in m3	Waste generation of 13.75 lacs m3 was planned.	Waste generation of 6.01 lacs m3 was achieved.	
2f	General remarks of inspecting officers on development of pit w.r.t. type of deposit etc	Nil	The development in 5 top common boundary pit upto 66mRL on section 0-0' and section -1 -1' was proposed. The depth-wise working over common boundary could not been started due to pending EC clearance in T.C. No. 04/49. The advancement in hangwall side benches within lease in North direction is lacking.	

Exploitation:

Sl.No.	Item	Propasals	Actual work	Remarks
3a	Number of pit proposed for production	Development and production in one pit was proposed.	Development and production in 5 Top pit is carried out.	

3b	Quantity of ROM mineral production proposed	The total target of ROM production was 680939 tonnes during 2015-16 as per distribution from lessee on capping on Environment clearance quantity.	Total 388190 tonnes of ROM production was reported during the year.
3c	Recovery of sailable/usable mineral from ROM production	The recovery of ore from ROM was planned 100% after screening.	ROM quantity of 68880 tonnes was despatched for processing and 68880 tonnes of grade-wise production is reported after dry process screening. The recovery of ore from ROM is 100%.
3d	Quantity of mineral reject generation	Mineral reject of 130750 tonnes was proposed below 54% Fe.	Mineral reject is not reported in monthly return and salable grade is reported. Grade-wise despatch is 79240 tonnes.
3e	Grade of mineral rejects generation and threshold value declared.	Mineral reject of below 54% Fe was considered in modified mining plan. Threshold value is +45% Fe.	Mineral reject generation is not reported during 2015-16. The grade-wise production during the year is -55% Fe 48000t, +55-58% Fe 0t, +58-60% Fe 120t, +60-62% Fe 14780t, +62-65% Fe 15330t fines and 1010t lumps.
3f	Quantity of sub grade mineral generation.	Nil	Nil
3g	Grade of sub grade mineral generation	Nil	Nil
3h	Manual / Mechanised method adopted for segregating from ROM	Dry screening was proposed for grade-wise production.	Electric operated mechanical screen plants are in use for grade wise production of iron ore in lumps and fines in adjoining Lamgao lease.
3i	Any analysis or beneficiation study proposed and carried out for sub grade mineral and rejects.	Nil	Nil

3j	Provision of drilling and blasting in mineral benches	Drilling and blasting was not proposed.	Drilling and blasting is not carried out and ripper dozer is used for excavation.
3k	Provision of mining machineries in mineral benches	Yes, backhoe excavators were proposed for excavation of ROM material. Dozer with ripper attachment is used in hard strata.	Backhoe excavators of 1.1m ³ bucket capacity are used for excavation of ROM material. Development in waste is also without drilling & blasting with the use of dozers. There are six dozers of 520, 570, 855hp, 10 backhoe of 428hp, 13 wheel loaders of 330 hp, 30 dumpers of 400hp and 6 dumpers of 350hp. All these machineries are common for Bicholim mine.
3l	Whether height of benches in overburden and mineral suitable for method of mining proposed in MP/SOM	Bench height of 7m was proposed in waste and Ore.	Yes, maximum bench height is upto 6-7m. There are 10 benches in waste/OB and 7 benches in ore of which few are common due to trend of mineralisation. Working Pit top RL is 138m and bottom RL is 72m.
3m	Total area covered under excavation/pits	It is within existing pit and total 53.51ha area was proposed under pit.	Total 53.51ha area is put in use under pit and additional area is not reported for degradation under pit.
3n	Ore to OB ratio for the pit/mine during the year.	Waste generation of 13.75 lacs m ³ was planned.	Waste generation of 6.01 lacs m ³ was achieved.
3o	Total area put in use under different heads at the end of year	Area under pit- 53.51ha, area under dump-18.80ha, roads - 0.00ha.	Area under pit- 53.51ha, area under dump-18.79ha, plants 0.0ha, mineral stacks -0.0ha and roads - 0.0a at the end of 2015-16.
3p	Production of ROM mineral during the last five year period as applicable	Proposed production was 1107850t, 1844610t, 0t, 0t, 680939t from 2011-12 to 2015-16 respectively.	Actual production was 138122t, 80109t, 0t, 0t, 388190t from 2011-12 to 2015-16 respectively.

3q General remarks Nil Nil
of inspecting
officers on
method of mining
etc.

Solid Waste Management - Dumping:

Sl.No.	Item	Propasals	Actual work	Remarks
4a	Separate dumping of topsoil, OB and mineral rejects (Rule 32,33)	Separate temporary backfilling of waste inside the 5 bottom pit was proposed. Proposed area was 5.309ha for waste and 0.6464ha for mineral stacking.	Separate temporary backfilling of waste inside the 5 bottom pit is carried out during the year 2015-16. Waste backfilling is over 3.254ha in 5 bottom pit.	
4b	Location of topsoil, OB and mineral reject dumps	Separate temporary backfilling of waste inside the 5 bottom pit was proposed.	Separate temporary backfilling of waste inside the 5 bottom pit is carried out during the year 2015-16.	
4c	Number of dumps within lease area and outside of lease area	There is one dump within lease and 6 dumps outside the lease. Six dumps outside lease are common for Bicholim mine. Temporary backfilling is proposed during 2015-16.	There is one dump within lease and 6 dumps outside the lease. Six dumps outside lease are common for Bicholim mine. Temporary backfilling is carried out in 5 bottom pit during 2015-16.	
4d	Location of dumps w.r.t. ultimate pit limit (Rule 16)	No external dumping was proposed; however temporary backfilling was proposed, which is within UPL.	Old Dump-3 is within UPL. No proposal for dumping of waste and temporary backfilling is carried out in 5 bottom pit due to limited area available for dumping.	
4e	Number of active and alive dumps.	There is no active and alive dump.	There is no active dump within lease area for waste dumping.	

4f	Number of dead dumps.	There is one dead dump within lease. Six dumps outside lease are common for Bicholim mine.	Dump-3 is dead dump within lease.
4g	Number of dumps established.	Nil	One
4h	Whether Retaining wall or garland drain all along dumps are there.	No proposal for 2015-16 for external dumping. Garland drain was proposed on different terraces of backfilled area to avoid wash-off.	Garland drain is made on two terraces of backfilled area to avoid wash-off.
4i	Length of Retaining wall or garland drain all along dumps	Proposed length was 1242m	Actual length is 650m.
4j	Number of settling ponds	Proposal of one settling pond was proposed in 5 bottom pit.	The proposal of keeping settling pond on north side of backfilled area towards Assonora river failed due to advance method of backfilling started instead of retreating method of backfilling from western & northern face in 5 bottom pit.
4k	Specific comments of inspecting officer on waste dump management	Nil	Old dump-3 is established. Temporary backfilling is carried out from south and eastern face in 5 bottom pit and garland drain of 650m X 2.5m X 1.5m dimension on two terraces of backfilled area has been made.

Solid Waste Management - Backfilling:

Sl.No.	Item	Propasals	Actual work	Remarks
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5a	Status of part or full extraction of mineral from mined out area before starting backfilling.	Due to paucity of area and restriction to dump the waste within lease area, it is proposed for temporary backfilling within 5 bottom Pit.	Temporary backfilling has been carry out from south and eastern face in 5 bottom pit
5b	Area under backfilling of mined out area	Mineral is persisting in 5 bottom pit and temporary backfilling is proposed. Void available in this pit is 416m X 155m x 46m.	Temporary backfilling is carried out in 5 bottom pit from south end upto surface level. Total 1503155 t waste was backfilled. It is over 420m X 80m area and advancing in north direction.
5c	Concurrent use of topsoil for restoration or rehabilitation of mineral out area (Rule 32)	Nil	Nil
5d	Total area fully reclaimed and rehabilitated	Nil	Nil
5e	General remarks of inspecting officers on backfilling and reclamation etc.	Nil	The proposal of keeping settling pond on north side of backfilled area towards Assonora river was to settle the sediments before discharge of water. But it got failed due to advance method of backfilling from south direction instead of retreating method of backfilling from western & northern face in 5 bottom pit.

Progressive Mine Clousre Plan:

Sl.No.	Item	Propasals	Actual work	Remarks
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6a	Whether Annual report on PMCP submitted on time and correctly. Rule 23 E(2).	There was no working in 2014-15 and PMCP report is submitted. It should be on or before 1st July every year.	PMCP report of 2015-16 is not became due as on date of report writing and it is not submitted for scrutiny. Previous approved document was valid upto 2012-13.
6b	Area available for rehabilitation (ha) .	Mineral is persisting in 5 bottom pit and temporary backfilling is proposed in it. Void available in this pit is 416m X 155m x 46m.	PMCP report of 2015-16 is not became due as on date of report writing and it is not submitted for scrutiny. Temporary backfilling is carried out in 5 bottom pit from south end in three terraces upto surface level. Area covered is almost 3.254ha.
6c	afforestation done (ha).	Nil	Nil
6d	No. of saplings planted during the year	No proposal	No plantation within lesae area is carried out.
6e	Cumulative no .of plants	Total 14000 saplings were planted during last approved document period from 2008-09 to 2012-13.	Total 14000 saplings were planted over 7.0ha from 2008-09 to 2012-13. It is mostly on dump-3.
6f	Any other method of rehabilitation	Nil	Nil
6g	Cost incurred on watch and care during the year	No proposal during 20115-16	Nil
6h	Compliance on reclamation and rehabilitation by backfilling (i) Voids available for backfilling (L x B x D	Void available for temporary backfilling in 5 bottom pit is 416m X 155m x 46m.	Temporary backfilling is carried out in 5 bottom pit from south end upto surface level. Total 1503155 t waste was backfilled. It is over 420m X 80m area and advancing in north direction.
6i	Compliance on reclamation and rehabilitation by backfilling (ii) Voids filled by waste / tailings	Tailing disposal in pit was not proposed.	Tailing disposal in pit not carried out in Bicholim mine.

6j	Compliance on reclamation and rehabilitation by backfilling (iii)Afforestation on on backfilled area	Nil	Nil
6k	Compliance on reclamation and rehabilitation by backfilling (iv) Rehabilitation by making water reservoir	5 bottom pits was used as water reservoir and backfilling is proposed during 2015-16.	Water reservoir is not proposed. 5 top pit is on high altitude compared to 5 bottom pit, which was earlier used as water reservoir. 5 bottom pit is adjoining to Assonora river.
6l	Compliance on reclamation and rehabilitation by backfilling (v)any other specific means.	Nil	Nil
6m	Compliance of rehabilitation of waste land within lease (i)afforestation	Nil	Nil
6n	Compliance of rehabilitation of waste land within lease (ii)Area rehabilitation (ha)	Nil	Nil
6o	Compliance of rehabilitation of waste land within lease (iii)Method of rehabilitation	Nil	Nil
6p	Compliance of environmental monitoring (core zone and buffer zone)	Quarterly environment monitoring is required and report has to be sent to IBM Regional office.	Quarterly environment monitoring is carried out through own as well as private agency.

6q	General remarks of inspecting officers on PMCP compliance and progressive closure operations etc.	Nil	Mineral is persisting in depth in the 5 bottom pit and temporary backfilling is proposed. Production planning is in 5 top pit. Therefore, specific proposals relevant to progressive mine closure plan are not there.
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Mineral Conservation:

Sl.No.	Item	Propasals	Actual work	Remarks
7a	ROM Mineral dispatch or grade-wise sorting within lease area	As per approved mining plan proposed ROM was classified as +60% Fe, +58-60% Fe, +55-58% Fe, +50-55% Fe, +45-50% Fe and below 54% Fe is considered as mineral reject due to low market price.	The ROM ore was dispatched to Lamgao lease of Bicholim mine for dry screening and thereafter grade-wise production and despatch is reported in Monthly returns from December 2015 to March 2016. After amendment in rule 45 on 19th April 2016, lessee has not reproted grade-wise production, despatch and stock in April 2016 return. ROM production , despatch is reported along with grade-wise sale quantity.	
7b	Method of grade-wise mineral sorting i.e. manual or mechanical.	Mechanical processing i.e. dry screening was proposed for grade-wise production.	The ROM ore was dispatched to Lamgao lease of Bicholim mine for dry screening and grade-wise production reporting.	
7c	Different grade of mineral sorted out at mines.	The grade-wise production of -54% Fe and +54% Fe was proposed in modified mining plan.	The grade-wise production of below 55% Fe, +55-58%Fe, +58-60% Fe, +60-62% Fe and +62-65% Fe is reported in the monthly returns during 2015-16. The grade-wise production during the year is -55% Fe 48000t, +55-58% Fe 0t, +58-60% Fe 120t, +60-62% Fe 14780t, +62-65% Fe 15330t fines and 1010t lumps.	

7d	Any beneficiation process at mines .	Mechanical processing i.e. dry screening was proposed for grade-wise production. It is located in Lamgao lease of Bicholim mine.	The ROM ore was dispatched to Lamgao lease of Bicholimi mine for dry screening.
7e	General remarks of inspecting officer on Mineral conservation and beneficiation issues	Nil	Nil

Environment:

Sl.No.	Item	Propasals	Actual work	Remarks
8a	Separate removal and utilization of topsoil (Rule 32)	Nil, Topsoil generation is not planned in the area.	Nil, Topsoil generation is not there.	
8b	Concurrent use or storage of topsoil	Nil	Nil	
8c	Separate dumps for overburden, waste rock, rejects and fines (Rule 33)	Proposal was to temporary backfill the waste inside the pit due to non-availability of other area for dumping and mineral is persisting in the pits.	Temporary backfilling is started during the year.	

8d	Use of overburden, waste rock, rejects and fines dumps for restoring the land to its original use	Nil	The mining lease is valid upto 27 Nov 2027 and temporary backfilling is carried out in 5 bottom pit from south end upto surface level. Total 1503155 t waste was backfilled. It is over 420m X 80m area and advancing in north direction. Assonora river is adjoining to lease area and 5 bottom pit. The temporary backfilling will become final backfilling during conceptual period.
8e	Phased restoration, reclamation and rehabilitation of lands affected by mining operations (Pits, dumps etc)	Nil	Dump-3 is restored with plantation and temporary backfilling is started in 5 bottom pit. The mining lease will remain in operation upto 2027.
8f	Baseline information on existence of plantation and additional plantation done (Rule 41)	Existence of plantation is there on slopes of the dump, along the road and other part of lease area. Additional plantation is not proposed during the year.	Additional plantation is not carried out during the year 2015-16. Total 14000 saplings were planted during previous five year period.
8g	Survival rate	No proposal.	Survival rate is around 80%. Gap filling plantation was done during 2008-09 to 2012-13.
8h	Water sprinkling on roads to control airborne dust	Yes, it is proposed for waster sprinkling on haul roads.	There are five water tankers in Bicholim mine of 8000-9000 litres capacity. Water sprilknlng on road is observed during the inspection.

8i	General remarks of inspecting officer on aesthetic beauty in and around mines area	Nil	Surrounding area beyond lease area is lush green and lessee has carried out plantation on dump, along road etc.
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Compliance of Rule 45:

Sl.No.	Item	Propasals	Actual work	Remarks
9a	Status of submission of Monthly and Annual returns	Annual return of mine for year 2014-15 submitted in hard copy. Monthly returns are submitted in online system upto April 2016.	All the monthly returns are submitted online and annual return in hard copy.	
9b	Scrutiny of Annual return for information on Mining Engineer, Geologist and Manager	The mine was closed during 2014-15 since last two years. Annual return of 2015-16 not yet became due and not received for scrutiny.	Shri Shrishaila Gouda is mining engineer since 10.03.2014. Shri Maheshwar Kinnal is geologist since 01.04.2003 and Shri Santosh Mandrekar is Mines manager since 07.08.2015. Previously Shri Shrishaila Gouda was mines manager in mines as per AR 2014-15. All these appointment are for the Bicholim mine and not for individual lease of Mandoorbaga. There are five-leases in Bicholim mine.	
9c	Scrutiny of Annual return on land use pattern for area under pits, reclaimed area, dumps etc.	Area under pit 49.3828ha, area under dump 17.2038ha and plant 16.5585ha, mineral stacks 1.92ha.	Land use pattern as per approved modified mining plan. Area under pit 53.51ha, area under dump 18.79ha and plant 0ha.	
9d	Scrutiny of Annual return on afforestation	Common detail for Bicholim mine was indicated in AR 2014-15 and it was zero during the year.	Total 0 trees with ML and 0 outside ML were reported in AR 2014-15. Mine was temporary closed during 2014-15.	

9e	Scrutiny of Annual return on mineral reject generation (Grade and quantity)	It was zero during the year 2014-15.	Mine was temporary closed during 2014-15.
9f	Scrutiny of Annual return on ROM stock and/or graded ore	ROM opening stock from opencast workings - 0t, Production - 0t and closing stock - 0t and opening stock dump workings - 505200t, Production - 0t and closing stock - 505200t. Grade-wise opening stock, production, despatch and closing stock for all slabs of fines and lumps was zero.	All the stocks were taken under possession of State Government for e-auction as per Supreme Court Order.
9g	Scrutiny of Annual return on sale value, Ex. Mine price and production cost	AR of 2014-15 is not having Ex mine price of ROM ore; as gradewise details for lumps and fines were nil.	All the stocks were taken under possession of State Government for e-auction as per Supreme Court Order. Ex. mine price is estimating after deducting transport cost, loading/unloading charges and other charges was 691, 1147, 1159, 1194 for below 55%, +58-60%, +60-62% Fe, +62-65% Fe grade fines. The dry screening plant is located in Lamgaon lease.

9h	Scrutiny of Annual return on fixed assets	AR of 2014-15 is having Fixed assests detail is given for lands, industrial building and machineries and own capital as source of finance. It is common for Bicholim mine and reference of Langao lease is indicated.	It is common for Bicholim mine and capital structure is common for Sesa Mining Corporation Limited.
9k	Scrutiny of Annual return on mining machineries	AR 2014-15 has reference of annexure-8, which is not found with the AR for scrutiny.	Following machinries are in use at mines. Dozer 6 Nos. of 405hp, Back Hoe 10 Nos. of 428hp), Wheel loader 13 Nos. of 330hp, Dumper 30 Nos. of 39 tonner, Dumper 6 Nos. of 350hpr, Water Tanker 2 Nos. of 8000 ltrs, Utility Vehicle 2 Nos and Crushing/screening Nil

Details of violations observed during current inspection and compliance position of violation pointed out

Violation observed			Show couse position		
Rule NO.	Issued on	Compliance on	Rule NO.	Issued on	Compliance on
Rule 13(1)	15/05/2016				
Rule 45(5)	15/05/2016				

Date :

(JANGID G K)

Indian Bureau of Mines