

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

MCDR INSPECTION REPORT

Bhubaneshwar regional office

Mine file No : ORI/CR/JJP/MCDR-12/BBS

Mine code : 11ORI19014

- (i) Name of the Inspecting : **U11**) **DAYANAND UPADHYAY**
Officer and ID No.
- (ii) Designation : Assistant Controller Mine
- (iii) Accompanying mine : Shri L. Mahapatra, Mines Manager, Shri S. Prusty Sr M
Official with
Designation
- (iv) Date of Inspection : 01/10/2016
- (v) Prev.inspection date : 23/11/2015

PART-I : GENERAL INFORMATION

1. (a) **Mine Name** : **SUKINDA**
- (b) **Registration NO.** :
- (c) Category : A Mechanised
- (d) Type of Working : Opencast
- (e) Postal address
State : ORISSA
District : JAJPUR
Village : KALIAPANI
Taluka : SUKINDA
Post office : KALIAPANI
Pin Code : 755047
FAX No. : 06726-268143
E-mail : smcgen@imfagroup.com
Phone : 06726-268139,268143
- (f) Police Station :
- (g) First opening date : 15/09/1999
- (h) Weekly day of rest : SUN
2. Address for : SUKINDA CHROMITE MINE IMFA
correspondance AT/PO-KALIAPANI
DIST-JAJPUR
3. (a) Lease Number : ORI0693
(b) Lease area : 116.76
(c) Period of lease : 30
(d) Date of Expiry : 03/09/2029
4. Mineral worked : CHROMITE Main

5. Name and Address of the

Lessee : INDIAN METALS & FERRO ALLOYS LIMITED
 IMFA, BOMIKHAL, BHUBANESWAR
 ORISSA. BHUBNESHWAR ORISSA
 Phone:0674-580100,580125
 FAX :0674-580045,580020

Owner : SUBHRAKANTA PANDA
 M/S INDIAN CHARGE CHROME
 LTD. IMFA BUILDING,
 BOMIKHAL, RASULGARH,
 BHUBANESWAR- 751 010 JAJPUR
 ORISSA
 Phone: 0674-2580100,25
 FAX : 0674- 2580020/

Agent : R.N.PRAHARAJ
 AT/PO-IMFA DIVISION OFFICE
 CHRDA CHAWK,JAJPUR ROAD
 JAJPUR ORISSA
 Phone: 06726 220458,220112
 FAX :

Mining Engineer

Name : J.BHATTACHARYA,Full Time
 Qualification : BE MINING
 Appointment/ : 14/10/2005
 Termination date

Geologist

Name : B.K.ACHARYA,Full Time
 Qualification : MSC GEOLOGY
 Appointment/ : 01/02/2000
 Termination date

Geologist

Name : D.P. MISHRA,Full Time
 Qualification : M.Sc (GEOLOGY)
 Appointment/ : 27/04/2004
 Termination date

Manager

Name : A.K. BHUYA
 Qualification : A.M.IE IN MINING ENGINEERING
 Appointment/ : 18/10/1999
 Termination date

Manager

Name : K.N. BHOI
 Qualification : AMIE
 Appointment/ : 24/09/2003
 Termination date

6. Date of approval of Mining	:	Fresh under rule 22 MCR1960	18/11/1999
Plan/Scheme of Mining	:	Mining Scheme rule 12 MCDR1988	22/10/2003
	:	Mining Scheme rule 12 MCDR1988	25/06/2004

Modif.approved Mining Scheme	06/05/2005
Modif.approved Mining Scheme	14/06/2007
Mining Scheme rule 12 MCDR1988	01/01/2010
Mining Scheme rule 12 MCDR1988	31/07/2013
Modif.approved Mining Scheme	23/09/2016

PART - II : OBSERVATION/COMMENTS OF INSPECTING OFFICERS

Exploration :

Sl.No.	Item	Proposals	Actual work	Remarks
1a	Backlog of previous year	Not proposed.	Not applicable.	Total lease area has been explored under G1 level .
1b	Exploration over lease area for geological axis 1 or 2	Not proposed.	Not applicable.	Total lease area has been explored under G1 level .
1c	Exploration Agencies and Expenditure in lakh rupees during the year	Not proposed.	Not applicable.	Total lease area has been explored under G1 level .
1d	Balance area to be explored to bring Geological axis in 1 or 2	Not proposed.	Not applicable.	Total lease area has been explored under G1 level .
1e	Balance reserve as on 01/04/20	85.85 Lakh T	Balance reserve as on 01.04.2016- 85.85 Lakh T under 111 & 122 category.	Reserves estimated as per modified schememof mining approved on 23.09.2016
1f	General remarks of inspecting officers on geology, exploration etc		Total lease area has been explored under G1 level .	Exploration has been carried out over the entire ML area of 116.76 ha.

Development :

Sl.No.	Item	Propasals	Actual work	Remarks
2a	Location of development w.r.t.lease area	Single open pit.	Opencast mining is concentrated in single pit.	The whole lease area is fully explored and development and winning of ore is presentally through single open pit.
2b	Separate benches in topsoil, overburden and minerals (Rule 15)	Separate benches in OB and ore with 8m height.	Separate benches in OB and ore with 8m height. No. of OB benches in F/W-18 & in H/w- 13 and in ore-06. Top RL-136 & Bottom RL-48.	There is not top soil.

2c	Stripping ratio or ore to OB ratio	1:2.8	1:2.44	
2d	Quantity of topsoil generation in m3	Not proposed.	Not applicable.	There is no top soil.
2e	Quantity of overburden generation in m3	781208 cu.m	670181 cu.m	2015-16.
2f	General remarks of inspecting officers on development of pit w.r.t. type of deposit etc	The whole lease area is fully explored and development and winning of ore is presentally through single open pit. The development of u/g mining has not been started till date of inspection.		The whole lease area is fully explored and development and winning of ore is presentally through single open pit as per proposal. The development of u/g mining has also been proposed from 2017-18.

Exploitation:

Sl.No.	Item	Propasals	Actual work	Remarks
3a	Number of pit proposed for production	Single pit.	Single pit.	Working is concentrated in single pit.
3b	Quantity of ROM mineral production proposed	273786T in 23015-16.	ROM produced in 2015-16 is 273598T	
3c	Recovery of sailable/usable mineral from ROM production	100%	99%	It is a captive mine and 99% utilisation through mineral beneficiation plant.

- 3d Quantity of mineral reject generation Not proposed. There is no generation of mineral reject. Presentally ROM generated from this mine is having above 30% cr₂o₃ which is totally utilised in its own captive plant. There is an old sub grade dump of a quantity approx. 6.12 lakh tonnes having +10% cr₂o₃ to -30% cr₂o₃ exist in the lease area.
- 3e Grade of mineral rejects generation and threshold value declared. Not proposed. There is no generation of mineral reject. Presentally ROM generated from this mine is having above 30% cr₂o₃ which is totally utilised in its own captive plant. There is an old sub grade dump of a quantity approx. 6.12 lakh tonnes having +10% cr₂o₃ to -30% cr₂o₃ exist in the lease area.
- 3f Quantity of sub grade mineral generation. Not proposed. There is no generation of subgrade. Presentally ROM generated from this mine is having above 30% cr₂o₃ which is totally utilised in its own captive plant. There is an old sub grade dump of a quantity approx. 6.12 lakh tonnes having +10% cr₂o₃ to -30% cr₂o₃ exist in the lease area.

- 3g Grade of sub grade mineral generation Not proposed. There is no generation of subgrade. Presentally ROM generated from this mine is having above 30% cr₂o₃ which is totally utilised in its own captive plant. There is an old sub grade dump of a quantity approx. 6.12 lakh tonnes having +10% cr₂o₃ to -30% cr₂o₃ exist in the lease area.
- 3h Manual / Mechanised method adopted for segregating from ROM Not proposed. There is no generation of subgrade. Presentally ROM generated from this mine is having above 30% cr₂o₃ which is totally utilised in its own captive plant. There is an old sub grade dump of a quantity approx. 6.12 lakh tonnes having +10% cr₂o₃ to -30% cr₂o₃ exist in the lease area.
- 3i Any analysis or beneficiation study proposed and carried out for sub grade mineral and rejects. Not proposed. At present there is no generation of subgrade. Lessee has proposed commissioning & operation of COB plant from 2018-19 in lease area. A bench scale study was conducted by lessee on chromite ore (10-30% cr₂o₃) in the laboratory of IBM, Nagpur during 2002. Furhter study has been carried out by IMMT, Bhubaneswar to develop flow sheet for enriching chromite ore.

3j	Provision of drilling and blasting in mineral benches	115mm DTH dia. drilling of blast hole.	DTH drilling of 115mm dia. Blast hole with emulsion/slurry explosive of 83mm dia alongwith delay detonator is being practiced for drilling and blasting.	Depth of blasting- 8.5m Burden- 2.5 to 4.5m spacing- 3 to 6m.
3k	Provision of mining machineries in mineral benches	Drilling machine, Excavator, Dumper etc.	DTH of 115mm dia. is used for drilling blast hole. Ore & OB are handled by excavator of 0.9 cu.m to 3.1 cu.m capacity with dumper of 16 to 32 T capacity.	Dozer is also used for road grading and three water sprinkler of 9 to 14 KL capacity are used for water spraying.
3l	Whether height of benches in overburden and mineral suitable for method of mining proposed in MP/SOM	Bench height 8m.	Excavator of 0.9 to 3.1 cu.m capacity are used of loading the Dumper of 16 to 32T capacity.	Bench height is suitably matched with the loading excavator.
3m	Total area covered under excavation/pits	28.30 ha	About 28.30 ha.	Working is concentrated in single pit.
3n	Ore to OB ratio for the pit/mine during the year.	1:2.8	1:2.44	
3o	Total area put in use under different heads at the end of year	116.76 ha during scheme period.	Total area covered is about 116.76 ha.	Total area covered includes mining, dump, road, infrastructure, ETP & settling pond, safety zones, etc.
3p	Production of ROM mineral during the last five year period as applicable	2011-12: 350250T 2012-13: 351000T 2013-14: 350994T 2014-15: 282467T 2015-16: 273786T	2011-12: 350168T 2012-13: 295206T 2013-14: 348658T 2014-15: 259730T 2015-16: 273598T	

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

The ROM production has been proposed from single pit . DTH drilling of 115mm dia. Blast hole with emulsion/ slurry explosive of 83mm dia alongwith delay detonator is being practiced for drilling and blasting.

Solid Waste Management - Dumping:

Sl.No.	Item	Propasals	Actual work	Remarks
4a	Separate dumping of topsoil, OB and mineral rejects (Rule 32,33)	Single dump of OB.	Single dump of OB.	There is no top soil and no generation of mineral reject at present.
4b	Location of topsoil, OB and mineral reject dumps	Single dump of OB.	Single dump of OB in north-west part of the ML.	There is no top soil and no generation of mineral reject at present. Presentally ROM generated from this mine is having above 30% Cr_2O_3 which is totally utilised in its own captive plant. There is an old sub grade dump of a quantity approx. 6.12 lakh tonnes having +10% Cr_2O_3 to -30% Cr_2O_3 exist in the lease area.
4c	Number of dumps within lease area and outside of lease area	Single dump of OB within lease area.	Single dump of OB within lease area.	There is no dump in outside lease area.

4d	Location of dumps w.r.t. ultimate pit limit (Rule 16)	Single dump of OB in north-west part of the ML.	Single dump of OB in north-west part of the ML.	Dump not falls under ultimate pit limit.
4e	Number of active and alive dumps.	Single dump of OB in north-west part of the ML.	Single dump of OB in north-west part of the ML.	
4f	Number of dead dumps.		There is no dead dump.	
4g	Number of dumps established.	Not proposed.	Not applicable.	Dump slope has been stabilised by coir matting and plantation.
4h	Whether Retaining wall or garland drain all along dumps are there.	Retaining wall.	Retaining wall (in part) and garland drain around the dump has been constructed. The extension of retaining wall in eastern part of the dump as proposed in 2016-17 has not been constructed.	The extension of retaining wall in eastern part of the dump as proposed in 2016-17 has not been constructed.
4i	Length of Retaining wall or garland drain all along dumps	Not specified.	Length of retaining wall- 290m Length of garland drain- 252m.	
4j	Number of settling ponds	Not proposed.	Not applicable.	

4k	Specific comments of inspecting officer on waste dump management	Partially the slope of the dump has been stabilised.	To avoid the erosion and rain slides application of natural geotextiles such as coir matting has been undertaken. Coir matting area of 2976 sq.m at the slope of the first stage OB dump and an area of 3890 sq.m. coir matting at slope of the second stage OB dump have been carried out for stabilisation. Along dump slope the seeds of the selected species of grasses and plants are applied along with some fertilizer.
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Solid Waste Management - Backfilling:

Sl.No.	Item	Propasals	Actual work	Remarks
5a	Status of part or full extraction of mineral from mined out area before starting backfilling.	Not proposed.	Pit is not matured for reclamation.	Mineralisation is continue and pit is not matured for reclamation.
5b	Area under backfilling of mined out area	Not proposed.	Pit is not matured for backfilling.	Mineralisation is continue and pit is not matured for reclamation.
5c	Concurrent use of topsoil for restoration or rehabilitation of mineral out area (Rule 32)	Not proposed.	Pit is not matured for reclamation.	Mineralisation is continue and pit is not matured for reclamation.

5d	Total area fully reclaimed and rehabilitated	Not proposed.	Pit is not matured for reclamation.	Mineralisation is continue and pit is not matured for reclamation.
5e	General remarks of inspecting officers on backfilling and reclamation etc.	Not proposed.	Pit is not matured for reclamation.	Mineralisation is continue and pit is not matured for reclamation.

Progressive Mine Clousre Plan:

Sl.No.	Item	Propasals	Actual work	Remarks
6a	Whether Annual report on PMCP submitted on time and correctly. Rule 23 E(2).	Not spcefied.	Annual return on PMCP has been submitted.	Annual return on PMCP under rule 23E(2) of MCDR'88 has been submitted in prescribed format by lessee vide letter no. IMFA/SMC/16/863, dated 22.06.2016.
6b	Area available for rehabilitation (ha) .	Not proposed.	Not applicable.	Area not matured for reclamation & rehabilitation. only Dump slope has been stabilized by coir matting and plantation.
6c	afforestation done (ha).	Afforestation proposed along slope of waste dump & safety zone..	In 2015-16, 3045 trees are planted by lessee in the lease area about 0.61 ha along slope of waste dump and safety zone.	Area has not been matured for reclamation & rehabilitation and afforestation proposed along slope of waste dump & safety zone.
6d	No. of saplings planted during the year	In 2015-16, afforestation proposed 2350 no. of tree along slope of waste dump & safety zone..	In 2015-16, 3045 trees are planted by lessee in the lease area about 0.61 ha along slope of waste dump and safety zone.	Area has not been matured for reclamation & rehabilitation and afforestation proposed along slope of waste dump & safety zone.

6e	Cumulative no .of plants	Not specfied.	As reported cumulative no. of trees planted by lessee is about 67886 nos.	Total area cover under plantation is about 22.06 ha.
6f	Any other method of rehabilitation	Not proposed.	Not applicable.	Area has not been matured for reclamation & rehabilitation.
6g	Cost incurred on watch and care during the year	Not specfied.	Expenditure incurred in Environment management during 2015-16 is Rs 619506.00.	Area has not been matured for reclamation & rehabilitation and afforestation proposed along slope of waste dump & safety zone.
6h	Compliance on reclamation and rehabilitation by backfilling (i) Voids available for backfilling (Lx B x D	Reclamation & rehabilitation not proposed.	Not applicable.	Area is not matured for reclamation & rehabilitation.
6i	Compliance on reclamation and rehabilitation by backfilling (ii) Voids filled by waste / tailings	Reclamation & rehabilitation not proposed.	Not applicable.	Area is not matured for reclamation & rehabilitation.
6j	Compliance on reclamation and rehabilitation by backfilling (iii)Afforestati on on backfilled area	Reclamation & rehabilitation not proposed.	Not applicable.	Area is not matured for reclamation & rehabilitation.
6k	Compliance on reclamation and rehabilitation by backfilling (iv) Rehabilitation by making water reservoir	Reclamation & rehabilitation not proposed.	Not applicable.	Area is not matured for reclamation & rehabilitation.

6l	Compliance on reclamation and rehabilitation by backfilling (v)any other specific means.	Reclamation & rehabilitation not proposed.	Not applicable.	Area is not matured for reclamation & rehabilitation.
6m	Compliance of rehabilitation of waste land within lease (i)afforestation	Not proposed.	Not applicable.	In 2015-16, 3045 trees are planted by lessee in the lease area about 0.61 ha along slope of waste dump and safety zone.
6n	Compliance of rehabilitation of waste land within lease (ii)Area rehabilitation (ha)	Not proposed.	Not applicable.	In 2015-16, 3045 trees are planted by lessee in the lease area about 0.61 ha along slope of waste dump and safety zone.
6o	Compliance of rehabilitation of waste land within lease (iii)Method of rehabilitation	Not proposed.	Not applicable.	In 2015-16, 3045 trees are planted by lessee in the lease area about 0.61 ha along slope of waste dump and safety zone.
6p	Compliance of environmental monitoring (core zone and buffer zone)	Quarterly monitoring.	Quarterly monitoring of air, water and noise level are being carried out.	Regularly data of quarterly monitoring of air, water and noise level has been submitted to this office and data found in permissible limit.

6q	General remarks of inspecting officers on PMCP compliance and progressive closure operations etc.	Area has not been matured for reclamation & rehabilitation and afforestation proposed along slope of waste dump & safety zone. In 2015-16, 3045 trees are planted by lessee in the lease area about 0.61 ha along slope of waste dump and safety zone. Regular data of quarterly monitoring of air, water and noise level has been submitted to this office .
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Mineral Conservation:

Sl.No.	Item	Propasals	Actual work	Remarks
7a	ROM Mineral dispatch or grade-wise sorting within lease area	ROM produced utilised in its own captive plant.	The ore produced from mine is is consumed in its own captive plant located at Choudwar & Therubail.	Plants acceptable grade of ore is +44% cr2o3 with cut off grade of 30% cr2o3.
7b	Method of grade-wise mineral sorting i.e. manual or mechanical.	Mechanically.	Mechanically.	Different grade of mineral sorted out at mines: 52% cr2o3 and above. Between 40% to 52% and below 40%
7c	Different grade of mineral sorted out at mines.	52% cr2o3 and above. Between 40% to 52% and below 40%	Different grade of mineral sorted out at mines: 52% cr2o3 and above. Between 40% to 52% and below 40%	

7d	Any beneficiation process at mines .	Commissioning & operation of COB plant has been proposed from 2018-19.	ROM from the mine is stacked as per different grade specification and is dispatched to lessee's captive plant located at Choudwar & Therubail.	Presentally ROM generated from this mine is having above 30% cr2o3.
7e	General remarks of inspecting officer on Mineral conservation and beneficiation issues		Presentally ROM generated from this mine is having above 30% cr2o3. ROM from the mine is stacked as per different grade specification and is dispatched to lessee's captive plant located at Choudwar & Therubail.	Lessee has proposed commissioning & operation of COB plant from 2018-19 in lease area.

Environment:

Sl.No.	Item	Propasals	Actual work	Remarks
8a	Separate removal and utilization of topsoil (Rule 32)	Not proposed.	Not applicable.	There is no top soil.
8b	Concurrent use or storage of topsoil	Not proposed.	Not applicable.	There is no top soil.
8c	Separate dumps for overburden, waste rock, rejects and fines (Rule 33)	Single dump of OB.	Single dump of OB.	
8d	Use of overburden, waste rock, rejects and fines dumps for restoring the land to its original use	Not proposed.	Area is not matured for reclamation.	Mineralisation is continue and pit is not matured for reclamation.

8e	Phased restoration, reclamation and rehabilitation of lands affected by mining operations (Pits, dumps etc)	Not proposed.	Area is not matured for reclamation.	Mineralisation is continue and pit is not matured for reclamation.
8f	Baseline information on existence of plantation and additional plantation done (Rule 41)	Plantation proposed along the slope of waste dump & safety zone.	Trees have been planted along the slope of waste dump and safety zone.	As reported cumulative no. of trees planted by lessee is about 69586 nos. Total area cover under plantation is about 22.06 ha.
8g	Survival rate	Not specified.	As reported survival rate is 90%.	
8h	Water sprinkling on roads to control airborne dust	Three water sprinkler	Three water sprinkler.	Three water sprinkler of 9 to 14 KL capacity are used for water spraying.
8i	General remarks of inspecting officer on aesthetic beauty in and around mines area			Aesthetic beauty in and around mined area is maintained. As reported cumulative no. of trees planted by lessee is about 69586 nos. Total area cover under plantation is about 22.06 ha.

Compliance of Rule 45:

Sl.No.	Item	Propasals	Actual work	Remarks
9a	Status of submission of Monthly and Annual returns	Monthly & Annual returns are being regularly submitted by lessee.	Monthly & Annual returns are being regularly submitted by lessee.	

9b	Scrutiny of Annual return for information on Mining Engineer, Geologist and Manager	Graduate Mining Engineer-5, Diploma mining Engineer-7, Geologist-2	Graduate Mining Engineer-5, Diploma mining Engineer-7, Geologist-2.
9c	Scrutiny of Annual return on land use pattern for area under pits, reclaimed area, dumps etc.	Pit-28.30 ha, waste dump & Sub grade-54 ha.	Pit-28.30 ha, waste dump & Sub grade-54 ha.
9d	Scrutiny of Annual return on afforestation	In 2015-16, 3045 trees	In 2015-16, 3045 nos of trees have been planted.
9e	Scrutiny of Annual return on mineral reject generation (Grade and quantity)	Mineral reject- Nil	Mineral reject- Nil
9f	Scrutiny of Annual return on ROM stock and/or graded ore	ROM in 2015-16: 3090.87T below 40% cr2o3(Lump) Fines: 29364.27T, below 40% cr2o3 69975.58T, 40% to 52% cr2o3 171168.110T, 52% cr2o3 & above	ROM in 2015-16: 3090.87T below 40% cr2o3(Lump) Fines: 29364.27T, below 40% cr2o3 69975.58T, 40% to 52% cr2o3 171168.110T, 52% cr2o3 & above
9g	Scrutiny of Annual return on sale value, Ex. Mine price and production cost	Ex-mine price (Rs/T)- 830.24	As per AR 2015-16, Ex-mine price (Rs/T)- 830.24
9h	Scrutiny of Annual return on fixed assets	Fixed asset- Rs140680.00	As per AR 2015-16, Fixed asset-Rs140680.00

9k	Scrutiny of Annual return on mining machineries	Drilling machine, Excavator, Dumper, Water Tanker, Motor grader, pumps.	Drilling machine, Excavator, Dumper, Water Tanker, Motor grader, pumps.
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Details of violations observed during current inspection and compliance position of violation pointed out

Violation observed		Show cause position	
Rule NO.	Issued on Compliance on	Rule NO.	Issued on Compliance on
Rule 13(1)	02/11/2016		
Rule 13(1)	02/11/2016		

Date :

(DAYANAND UPADHYAY)

Indian Bureau of Mines