

**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 : Sr. Asst. Contrl. Mines
- (iii) Accompanying mine : Shri Manoj Samal, Mines Manager  
Official with  
Designation
- (iv) Date of Inspection : 05/01/2018
- (v) Prev.inspection date : 01/10/2016

**PART-I : GENERAL INFORMATION**

1. (a) **Mine Name** : **SUKINDA**
- (b) **Registration NO.** : **IBM/4200//2011**
- (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.	As per approved scheme of mining in plan period of 2014-15, 2015-16 & 2016-17 no drilling was proposed.
1b	Exploration over lease area for geological axis 1 or 2	Not proposed.	Not applicable.	As per approved scheme of mining in plan period of 2014-15, 2015-16 & 2016-17 no drilling was proposed.
1c	Exploration Agencies and Expenditure in lakh rupees during the year	Not proposed.	Not applicable.	As per approved scheme of mining in plan period of 2014-15, 2015-16 & 2016-17 no drilling was proposed.
1d	Balance area to be explored to bring Geological axis in 1 or 2	Not proposed.	Not applicable.	Total potentially mineralised area about 46.76 ha has been explored under G1 level of exploration.
1e	Balance reserve as on 01/04/20		Balance reserve as on 01.04.2017- 55.95 Lakh T under 111 & 26.40 Lakh T under 122 category.	Reserves estimated as per modified scheme of mining approved on 23.09.2016
1f	General remarks of inspecting officers on geology, exploration etc		Total potentially mineralised area about 46.76 ha has been explored under G1 level of exploration.	Total potentially mineralised area about 46.76 ha has been explored under G1 level of exploration.

## Development :

Sl.No.	Item	Proposals	Actual work	Remarks
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2a	Location of development w.r.t.lease area	Pit located between E 3111- 3586 and N 1700- 2070.	Pit is located between co-ordinates E 3111- 3586 and N 1700- 2070.	Opencast mining is concentrated in single 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-158 & Bottom RL-46.	There is no top soil benches proposed in approved scheme of mining.
2c	Stripping ratio or ore to OB ratio	1:1.85	1:1.85	
2d	Quantity of topsoil generation in m3	Not proposed.	Not applicable.	
2e	Quantity of overburden generation in m3	650000 cu.m in 2015-16.	649700 cu.m.	The development is within the approved limit.
2f	General remarks of inspecting officers on development of pit w.r.t. type of deposit etc		The potentially mineralised area is fully explored.The development and excavation of ROM is presentally through single open pit in ore band-1 as per approved proposal.	The potentially mineralised area is fully explored.The development and excavation of ROM is presentally through single open pit in ore band-1 as per approved proposal.

### 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	351000T in 23016-17.	ROM produced in 2016-17 is 350512T	The ROM production is within the proposed limit of production.
3c	Recovery of sailable/usable mineral from ROM production	100%	100%	It is a captive mine and 100% of ROM 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% cr <sub>2</sub> o <sub>3</sub> 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 <sub>2</sub> o <sub>3</sub> to -30% cr <sub>2</sub> o <sub>3</sub> 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% cr <sub>2</sub> o <sub>3</sub> 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 <sub>2</sub> o <sub>3</sub> to -30% cr <sub>2</sub> o <sub>3</sub> exist in the lease area.
3f	Quantity of sub grade mineral generation.	Not proposed.	There is no generation of mineral reject/ sub grade.	There is an old sub grade dump of a quantity approx. 6.12 lakh tonnes having +10% cr <sub>2</sub> o <sub>3</sub> to -30% cr <sub>2</sub> o <sub>3</sub> exist in the lease area.
3g	Grade of sub grade mineral generation	Not proposed.	Not applicable.	There is an old sub grade dump of a quantity approx. 6.12 lakh tonnes having +10% cr <sub>2</sub> o <sub>3</sub> to -30% cr <sub>2</sub> o <sub>3</sub> exist in the lease area.
3h	Manual / Mechanised method adopted for segregating from ROM	Mechanised.	Mechanised.	Mechanised method is adopted for segregating from ROM.

3i	Any analysis or beneficiation study proposed and carried out for sub grade mineral and rejects.	Not proposed.	Not applicable.	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% cr <sub>2</sub> o <sub>3</sub> ) in the laboratory of IBM, Nagpur during 2002. Further 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	Balsting with 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- 115mm dia. , Excavator- 0.9 to 3.1 cu.m, Dumper-15-32T 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.	1:1.85	1:1.85	

3o	Total area put in use under different heads at the end of year	116.76 ha during scheme period.	Total area covered includes mining-28.30ha, dump-49.59, road-4.35ha, infrastructure-12.372ha, ETP-5.66ha, safety zone-4.138ha.	Total area covered includes mining-28.30ha, dump-49.59, road-4.35ha, infrastructure-12.372ha, ETP-5.66ha, safety zone-4.138ha.
3p	Production of ROM mineral during the last five year period as applicable	2012-13: 351000T 2013-14: 350994T 2014-15: 282467T 2015-16: 273786T 2016-17: 351000T	2012-13: 295206T 2013-14: 348658T 2014-15: 259730T 2015-16: 273598T 2016-17: 350512T	ROM production for the year 2016-17 is near to proposed production limit.
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.	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.

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#### Solid Waste Management - Dumping:

Sl.No.	Item	Propasals	Actual work	Remarks
4a	Separate dumping of topsoil, OB and mineral rejects (Rule 32,33)	Separate dump of OB. Top soil dump-nil.	Single dump of OB in north west part of the lease.	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 in north-west part (E 2055-3165, N 1945-2304) of the ML.	Single dump of OB in north-west (E 2055-3165, N 1945-2304) part of the ML.	There is no top soil and no generation of mineral reject at present.



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)	OB dump in north-west part (E 2055-3165, N 1945-2304) of the ML.	OB dump is located in north-west part (E 2055-3165, N 1945-2304) of the ML.	There is no top soil and no generation of mineral reject at present.
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.	There is no top soil and no generation of mineral reject at present.
4f	Number of dead dumps.	Nil	There is no dead dump.	There is single active dump of OB in north-west part of the ML.
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 of 100mX1mX1m.	Proposed retaining wall of 100mX1mX1m has been constructed..	Dump slope has been stabilised by coir matting and plantation.
4i	Length of Retaining wall or garland drain all along dumps	Retaining wall of 100mX1mX1m.	Proposed retaining wall of 100mX1mX1m has been constructed..	Around the waste dump garland drain and retaining wall have been maintained.
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 along dump slope. Plantation along the dump slope has been carried out with proper terracing.

## 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.		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 for the year 2016-17 on PMCP has been submitted.
6b	Area available for rehabilitation (ha) .	Not proposed.	Area not matured for reclamation & rehabilitation. Only Dump slope of about 0.73 ha. area has been stabilized by coir matting and plantation	Area not matured for reclamation & rehabilitation. Only Dump slope has been stabilized by coir matting and plantation.

6c	afforestation done (ha).	Afforestation with 1000nos of saplings proposed along slope of waste dump & safety zone..	In 2016-17, 2175 trees are planted by lessee in the lease area about 0.0.73 ha along slope of waste dump and safety zone.	Afforestation has proposed along slope of waste dump & safety zone.
6d	No. of saplings planted during the year	1000 nos of saplings.	In 2016-17, 2175 trees are planted by lessee in the lease area.	Afforestation has proposed along slope of waste dump & safety zone.
6e	Cumulative no .of plants	Not specified.	As reported cumulative no. of trees planted by lessee is about 70061 nos.	Total area cover under plantation is about 22.19 ha.
6f	Any other method of rehabilitation	Not proposed.	Not applicable.	Area not matured for reclamation & rehabilitation.
6g	Cost incurred on watch and care during the year	Not specified.	Expenditure incurred in Environment management during 2016-17 is Rs 40.5 lakh.	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	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	Not proposed.	Not applicable.	Area is not matured for reclamation & rehabilitation.
6j	Compliance on reclamation and rehabilitation by backfilling (iii)Afforestation on on backfilled area	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	Not proposed.	Not applicable.	Area is not matured for reclamation & rehabilitation.
6l	Compliance on reclamation and rehabilitation by backfilling (v)any other specific means.	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.	Area is not matured for reclamation & rehabilitation.
6n	Compliance of rehabilitation of waste land within lease (ii)Area rehabilitation (ha)	Not proposed.	Not applicable.	Area is not matured for reclamation & rehabilitation.
6o	Compliance of rehabilitation of waste land within lease (iii)Method of rehabilitation	Not proposed.	Not applicable.	Area is not matured for reclamation & rehabilitation.
6p	Compliance of environmental monitoring (core zone and buffer zone)	Quarterly monitoring.	Quarterly monitoring of air, water and noise level are being carried out.	Quarterly monitoring of air, water and noise level are being carried out.

6q	General remarks of inspecting officers on PMCP compliance and progressive closure operations etc.	Area has not been matured for reclamation & rehabilitation. Afforestation has been carried out along slope of waste dump & safety zone.	Area has not been matured for reclamation & rehabilitation and afforestation proposed along slope of waste dump & safety zone. In 2016-17, 2175 trees are planted by lessee in the lease area about 0.73 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.	
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%	Different grade of mineral sorted out at mine by mechanical means.
7d	Any beneficiation process at mines .	Not proposed.	Not applicable.	Commissioning & operation of COB plant has been proposed from 2018-19.

7e	General remarks of inspecting officer on Mineral conservation and beneficiation issues	Presentally ROM generated from this mine is having above 30% cr <sub>2</sub> o <sub>3</sub> . 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.
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**Environment:**

Sl.No.	Item	Propasals	Actual work	Remarks
8a	Separate removal and utilization of topsoil (Rule 32)	Not proposed.	Not applicable.	No top soil has been proposed in approved scheme of mining.
8b	Concurrent use or storage of topsoil	Not proposed.	Not applicable.	No top soil has been proposed in approved scheme of mining.
8c	Separate dumps for overburden, waste rock, rejects and fines (Rule 33)	Separate dump of OB. Mineral reject not proposed.	Separate dump of OB. There is no mineral reject generation.	Separate dump of OB. There is no mineral reject generation.
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.

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8f	Baseline information on existence of plantation and additional plantation done (Rule 41)	Plantation proposed along the slope of waste dump & safety zone.	About 2175 nos of trees have been planted for the year 2016-17 along the slope of waste dump and safety zone.	As reported cumulative no. of trees planted by lessee is about 70061 nos. Total area cover under plantation is about 22.19 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		About 2175 nos of trees have been planted for the year 2016-17 along the slope of waste dump and safety zone.	Aesthetic beauty in and around mined area is maintained. As reported cumulative no. of trees planted by lessee is about 70061 nos. Total area cover under plantation is about 22.19 ha.

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Compliance of Rule 45:

Sl.No.	Item	Proposals	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.	Annual return for the year 2016-17 has been received.
9b	Scrutiny of Annual return for information on Mining Engineer, Geologist and Manager	Graduate Mining Engineer-3, Diploma mining Engineer-4, Geologist-2, Surveyor-2.	Graduate Mining Engineer-3, Diploma mining Engineer-4, Geologist-2, Surveyor-2.	Graduate Mining Engineer-3, Diploma mining Engineer-4, Geologist-2, Surveyor-2.

9c	Scrutiny of Annual return on land use pattern for area under pits, reclaimed area, dumps etc.	Pit-28.30 ha, waste dump-49.59ha, Infrastructure & road-23.432ha, Stack yard & others -15.438 ha.	Pit-28.30 ha, waste dump-49.59ha, Infrastructure & road-23.432ha, Stack yard & others -15.438 ha.	Pit-28.30 ha, waste dump-49.59ha, Infrastructure & road-23.432ha, Stack yard & others -15.438 ha.
9d	Scrutiny of Annual return on afforestation	In 2016-17, 2175 nos. of tree.	In 2016-17, 2175 nos of trees have been planted.	In 2016-17, 2175 nos of trees have been planted.
9e	Scrutiny of Annual return on mineral reject generation (Grade and quantity)	Nil	Nil	All the ROM produced has been utilised for its own captive plant.
9f	Scrutiny of Annual return on ROM stock and/or graded ore	ROM in 2016-17: 412.910T below 40-52% cr2o3(Lump) Fines: 58504.73T, below 40% cr2o3 77572.63T, 40% to 52% cr2o3 214046.14T, 52% cr2o3 & above	ROM in 2016-17: 412.910T below 40-52% cr2o3(Lump) Fines: 58504.73T, below 40% cr2o3 77572.63T, 40% to 52% cr2o3 214046.14T, 52% cr2o3 & above	
9g	Scrutiny of Annual return on sale value, Ex. Mine price and production cost	Ex-mine price (Rs/T)- 2662.46	Ex-mine price (Rs/T)- 2662.46	This is captive mines and Ex-mine price as furnished in AR is (Rs/T)- 2662.46
9h	Scrutiny of Annual return on fixed assets	Fixed asset-Rs 251616867.00	Fixed asset-Rs 251616867.00	As per AR 2016-17, Fixed asset-Rs 251616867.00
9k	Scrutiny of Annual return on mining machineries	Blast hole drill-115mm dia, Back Hoe, Front end loader, Dumper, Water Tanker, Motor grader, pumps.	Back Hoe-4 (2.1 & 3.1 cu.m capacity), Dumper-21 (32T capacity), Dozer-2 (200HP & 177HP), Drilling machine-1 (115mm dia).	Back Hoe-4 (2.1 & 3.1 cu.m capacity), Dumper-21 (32T capacity), Dozer-2 (200HP & 177HP), Drilling machine-1 (115mm dia).



**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

**Date :**

(DAYANAND UPADHYAY)

Indian Bureau of Mines