INDIAN BUREAU OF MINES MINERALS DEVELOPMENT AND REGULATION DIVISION

MCDR INSPECTION REPORT

Bangalore regional office

Mine file No : KNT/RCH/AU/1/BNG Mine code: 27KAR16001

(i)Name of the Inspecting : P005) C.PARAMESHWARAN

Officer and ID No.

(ii) Designation : Deputy Controller Mines

(iii) Accompaning mine : Shri. Shanthakumar, Mines Manager & Dr.P. sanguramath

Official with Designation

(iv) Date of Inspection : 17/11/2015 Prev.inspection date : 01/09/2014 (v)

PART-I : GENERAL INFORMATION

(a) Mine Name : HUTTI

(b) Registration NO.

: A Fully Mechanised (C) Category

(d) Type of Working Underground

(e) Postal address

> State : KARNATAKA District RAICHUR Village HUTTI Taluka LINGSUGUR HUTTI

Post office

Pin Code

08537-275054 FAX No. E-mail : hygomin@bsnl.in 08537-275025 Phone

:

(f) Police Station : HUTTI

First opening date : 19/12/1978 (g)

Weekly day of rest (h) : SUN

Address for : At & Po- HUTTI,

correspondance Tq- Lingasugur, Dist- Raichur

KARNATAKA - 584 115

3. : KAR0589 (a) Lease Number (b) Lease area : 528.1 Period of lease : 30 (C)

> (d) Date of Expiry : 19/12/2008

Mineral worked 4. : GOLD Main

> Associated SILVER

5. Name and Address of the

Lessee : HUTTI GOLD MINES COMPANY LTD

At & Po- Hutti Tq-Lingsugur 584 115 RAICHUR KARNATAKA

Phone: 08537-275025 FAX: 08537-275054

Owner : HUTTI GOLD MINES COMPANY LTD

Shri A.K.Monnappa, IAS, MD 3rd Floor, KHB Shopping Complex, National Games Village, Koramangala BANGALORE KARNATAKA Phone: 080-25710501, 2

FAX :

Agent : PRAKASH

At & Po- HUTTI Tq-Lingsugur

RAICHUR KARNATAKA Phone: 08537-275034 FAX : 08537-275054

Mining Engineer

Name : PRAKASH, Full Time

Qualification : B. Tech. Mining, 1st Class

Appointment/ : 15/11/2011

Termination date

Geologist

Name : PRABHAKAR.SANGURMATH,Full Time

Qualification : M.Sc(AG), Ph.D Appointment/ : 01/04/1996

Termination date

Manager

Name : SHANTH KUMAR

Qualification : Dip. in Mining, First Class

Appointment/ : 08/12/2011

Termination date

6. Date of approval of Mining
Plan/Scheme of Mining
Mining Scheme rule 12 MCDR1988
Renewal under rule 24 MCR1960
Mining Scheme rule 12 MCDR1988
13/02/2014

PART - II : OBSERVATION/COMMENTS OF INSPECTING OFFICERS

Exploration :

Sl.No.	Item	Proposals	Actual work	Remarks
1a	Backlog of previous year	For the year 2008-09 to 2012-2013. Proposals made for the year 2013-14 to 2015-16.	(upto 2008-09 to 2012-13, 13250m in U/g diamond drilling=7751m was achived. 18870m in surface DD=10056m achived.).	both inhouse & contract division were carried out and shortage happened, due to various problems.
1b	Exploration over lease area for geological axis 1 or 2	As per the last approved document, Oakleys reef, middle reef, Zone-1, village reef, strike (H/W) reef, Strike (F/w) reef.	as per the 2008-09 to 2012-13 out come of exploration additional ore/ reserve established under UNFC category as follows. 1100m, 950m, 1050m, 250m, 800m & 650m respectively pertaining to above reefs. grades from 4.20g/t to 8.51g/t. Out which middle reef & Strike (H/w given better higher grade.	
1c	Exploration Agencies and Expenditure in lakh rupees during the year	Both contract division & inhouse people for drilling	accordingly, both contract & in house people undertaken the major explorations.	few hundreds of meters were felt shortage to the targetted drilling.
1d	Balance area to be explored to bring Geological axis in 1 or 2	yes proposed in the present approved document from 2013-14 to 2017-18 respectively.	For the 2014-15=18 nos. drilling exploration through outsourcing=3865.85m, u/g by core drilling=15 nos holes=743.30m and also 25 nos of holes through outsourcing=3230.70m & two nos. trenches at surface=289.75m3 as per the annual returns 2014-15.	all the information pertaining to the year 2014-15.

1e Balance reserve as on 01/04/20

as per 1.4.2013=94,5 2,010 tonnes at 5.31g/t. respectively. but as pe the annual returns 2014-15=9.39 million tonnes. at 5.34g/t(111 catgory as per UNFC) and 0.59+7.23 million tonnes of resources at 4.58 & 4.83g/t gold.(as per UNFC-332 & 333)

asper the returns 2014-15. The bore details furnished for the year 2014-15 only. But for the for the year 2015-16, no intimation given by the company in Form-J, which ought to, without that, the bore holes drilled as per the proposals, given by the company as 1554m in S/f & 2700m in U/g for the year 2015-16, found to be not authentic, hence the violation was issued.

1f General remarks of inspecting officers on

geology, exploration etc

as per the approved document and the annual returns the details are furnished on geology & exploration are found to

satisfactory.

For the 2014-15=18 nos. drilling exploration through

outsourcing=3865.85m, u/g by core drilling=15 nos holes=743.30m and also 25 nos of holes through

outsourcing=3230.70m & two nos. trenches at surface=289.75m3 as per the annual returns 2014-15.

over all staisfactory.

Development :

Sl.No. Item Propasals Actual work Remarks

2a	Location of development w.r.t.lease area	different	As reported by the mine manager, that the present level development during the year 2015-16 is in Strike reef-(SR) in 24th & 25th level.Zone-I reef in 24 to 26th level, in middle reef- 24th & 26th level and in Oakleys 20th, 22nd, 24th to 26th level respectively. as per the 2014-15 driving=2829.70m, x-cut/f/w drives in barren rock=2261.49m, winzing=2.5m, raising=441.43m & shaft sinking=64m and stope preparation=2784.36m respectively.	as reported in 14-15 AR.
2b	Separate benches in topsoil, overburden and minerals (Rule 15)	not applicable, since it is U/g mine.	work pertaining u/g levels in barren rock/ along the ore body are under progress.	all the activities are as per the u/g proposals and work is progress accordingly.
2c	Stripping ratio or ore to OB ratio	not applicable	very megre quantity in comparison to ROM & waste. recovery of gold is less 0.25 tones, for producing 4-5lakhs of ROM.	very megre percentage of ore to waste rtio.
2d	Quantity of topsoil generation in m3	not applicable	not applicable, since it entirely different u/g operations.	nil
2e	Quantity of overburden generation in m3	not applicable.	nil	nil
2f	General remarks of inspecting officers on development of pit w.r.t. type of deposit etc	gold mine, comparing to open cast this entirely	all underground method of workings. the boundary pillars are maintained as per the requirments of the state Govt. for 528.35 ha.	based on the approved document, the underground work is in progress to the satisfaction.

Actual work

Remarks

Exploitation:

Item

Propasals

Sl.No.

3a	Number of pit proposed for production	in ore & waste, sub level development along the ore=1050m development & incidental ore from the deveopment=267 42m for 3 yrs. stope production is	for 2014-15=2829.70m, x-cuts+f/w drives=2261.49m, winzing=2.5m, raising=441.43m & shaft sinking=64m NS Stope Preparation=2784, respectively. for 2015- 16,, In SR H/w-8th level to 11th level in A Block., 15-17 level-GE32 block, 20-22 level in FE 32block. in VR-6-8th level in 2-block, In Z-1 reef-15-17 level BE 29- 30 C Block, In middle reef-14-16, in M7-2 block, 18-20 GE52 A- block, 20-22 level CE41- 42 in Central shaft. In Oakleys reef-17-19=43 '7P block.	As recd from the manager Mines.
3b	Quantity of ROM mineral production proposed	For the year 2014-15=553768t, 2015-16=561588t(includes incidental ore+stope production)at 4.7g/t of ore.	from development & stope for the year =406508t at 4.32g/t. and for the year 2015-16= 524607t(gold budget=1550838g, actual is 1244190g respectively.	short fall in the tonnage aswell as in gold.
3c	Recovery of sailable/usable mineral from ROM production	for production of ROM	complete ROM will be processed and the gold will be extracted. as per the year 2014-15= for feed of 468735t of ore and extracted 1290.26kgs of gold at 3.04g/t. Tailings as waste is 468735t at 0.29g/t loosed in the mill tailings.	only after the processing, the final gold will be extracted, which is out of control of manual forces.
3d	Quantity of mineral reject generation	3383+6306+1357 1t of waste proposed to develop for the year 2013- 14 to 2015-16	13364t of waste hoisted for the year 2014-15.	for the current year yet to recive.
3e	Grade of mineral rejects generation and threshold value declared.	not proposed for the complete scheme of mining.	nil	nil

3f	Quantity of sub grade mineral generation.	not proposed.	nil	all the ore hoisted from the U/g mine will be sent to beneficiation plant at Main Hutti mines plant for final processing.
3g	Grade of sub grade mineral generation	not applicable.	nil	nil
3h	Manual / Mechanised method adopted for segregating from ROM	mechanical	mechanical	yes mechanical
3i	Any analysis or beneficiation study proposed and carried out for sub grade mineral and rejects.	proposed to beneficiate along with ore of low grade from mangalur	yes proposed for blending with hutti ore & the Mangalur ore and will treated.	not treated as such for the year, since the mangalur mine is not operating.
3j	Provision of drilling and blasting in mineral benches	yes provision made for drilling & blasting in the drives, x-cuts, winze, shaft and the stopes.	yes all the above areas involves drilling & blasting, without which no activity will be possible.	yes, drilling & blasting is must for any developement or for progress.
3k	Provision of mining machineries in mineral benches	yes provision made.	wagon drills for drilling holes, LHD Cum LPDT combination machines used in trackless area in u/g and surafce., alos hopper loaders into tubs, etc. are used.	yes those machineries are for u/g low profile areas.
31	Whether height of benches in overburden and mineral suitable for method of mining proposed in MP/SOM	al these pertains to Underground levela and stopes, winze and shaft.	all the items of work pertains to underground has been approved in the scheme of mining document.	yes it is undertaken in underground as per the underground pattern or the method of workings.
3m	Total area covered under excavation/pits	complete area comes in underground, nothing in surface as such for	all the work carried out below the ground. other things are infrastructures.	yes nothing on surface, only in underground.

excavations.

3n	Ore to OB ratio for the pit/mine during the year.	for five years	within the proposed one	yes as it is.
30	Total area put in use under different heads at the end of year		260.38 at the end of five years period, i.e. 2017-18.	almost to the extent.
3p	Production of ROM mineral during the last five year period as applicable		2011-12=560216 2012-13=599090t 2013-14=374764t 2014-15=468735t 2015-16=524607t	as reported by the lessee company.
3q	General remarks of inspecting officers on method of mining etc.	yes proposed for underground gold mining	as per the approved scheme of mining work is in progress	as per the proposals are going, some are not.

Solid Waste Management - Dumping:

Sl.No.	Item	Propasals	Actual work	Remarks
4a	Separate dumping of topsoil, OB and mineral rejects (Rule 32,33)	as such , it is u/g mine, accordingly, waste rock will be hoisted	will be analysed and sent to mill/ plant for beneficiation and waste will be taken to some useful purposes or	no top soil, OB, rejects & waste like black rock will be dealt separtely to surface or for support purposes.
4b	Location of topsoil, OB and mineral reject dumps	such for top	proposal to waste/ black rock handled separetely to surface and the ore will be taken to plant for processing.	yes as above.
4c	Number of dumps within lease area and outside of lease area		waste rock/ mill tailings are placed in the ear marked place with necessary protections.	yes all the dumps will be kept within the lease.

4d	Location of dumps w.r.t. ultimate pit limit (Rule 16)	as per the approved document.	all the dumps are on surface & workings are in u/g.	yes as it is.
4e	Number of active and alive dumps.		one for mill tailings & one for dumping black rock.	1+1 waste and tailings.
4f	Number of dead dumps.	phased wise tailing dumps are making dead in one side & advancing other side.	accordingly, phased wise approximately 100m x 100m or 150m size area they spread the mill taings and moving to other places.	yes doing phased wise and afforestation on that & making dead, so that, further dumping will not be possible.
4g	Number of dumps established.	39.08 ha indicated in the begining of the proposals.	same 39.08 ha is continued in the next five years.	same as above.
4h	Whether Retaining wall or garland drain all along dumps are there.	yes proposed on the dead dump side.	as the dump is advancing, leaving such area, other areas will be constructed with retaining wall.	provided with dry rock type wall allaround.
4i	Length of Retaining wall or garland drain all along dumps	yes proposed to construct dry wall all around and some garland drain.	it is being constructed and in progress.	yes under progress.
4j	Number of settling ponds	yes proposed	Atleast three around the tailings.	yes around the tailngs some of the settlings ponds provided.
4k	Specific comments of inspecting officer on waste dump management	provided and maintained on surface.	Absolutely there is not much problem, because waste from the mill is coming out as mill tailngs and directed to the locations in the phased dump area and controlled manually.	satisfactory on the surface.

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.	proposed for fillings and back filling (filling stopes- voids created after extraction of ore body in underground).	all the underground workings in the form of stopes are filled back as per the approved proposals in the documents. some stopes are not filled, will be left open, if it is open stopes, where the strata condition is competent.	filling will be generally takes place after the extraction of ore from the stopes as per the stope blocks.
5b	Area under backfilling of mined out area	yes proposal made in the approved document.	In 2014-15= in SRF 13 inter-10 L JE34=36340t stowing, MR-18L GE9-34600t stowing, MR-19LEE47-4550t stowing, MR-20L Ge51-10770t stowing, OR 19L AE39-2320t stowing(total 88580t), 2015-16= in Oakleys reef=level 17-19, in level Middle R=17-18,(OR 19L AE39-61640t stowing, MR-19L EE47 16060t stowing, OR 20L BE41-4520t stowing, SR 11L HE31-14920t stowing, OR 17L AW37-3320t-stowing=total 100460t)	yes as per the approval & proposals were carried out in the mined out area.
5c	Concurrent use of topsoil for restoration or rehabilitation of mineral out area (Rule 32)	in u/g no such provision of top soil, restoration, rehabilitaion.	Only thing is whaterevr development will be remauns as it is, but the stopes if any will be back filled, if it found weak starta or left open if is competent with approval of competent authority, i.e NIRM.	all the above item of opertaion will be in open pit mine & in u/g will be different.
5d	Total area fully reclaimed and rehabilitated		all the stopes have chance to go for complete filling or in part(atleast 60% of the opening created.	very rarely 100%, other wise as advised by NIRM, Govt. of India agency to decide.
5e	General remarks of inspecting officers on backfilling and reclamation etc.	u/g workings.	accordingly, in phased manner, in sequentially it will be taken as it warrants for the safety of the people.	As per the DGMS, will carry out their inspection to monitor.
	Progressive Mine	Clousre Plan:		

Actual work

Remarks

Sl.No.

Item

Propasals

6a	Whether Annual report on PMCP submitted on time and correctly. Rule 23 E(2).	Not submitted for the year 2014-15.	other than the stoping/ filling after the stope is mined out from the respective levels and the shafts.	other than this no other PMCP work in this mine.
6b	Area available for rehabilitation (ha) .	phased manner of rehabilitation, one after the other as per the approved scheme of mining.	yes in phased manner it is under progress.	yes phased manner work is in progress.
6c	afforestation done (ha).	proposed on surface.	yes in the mill tailings areas, where the particular level of fillings is over and in other area of colony, offices, schools, etc.	yes only on surface as per the proposals made/ envisaged in the approved document.
6d	No. of saplings planted during the year	proposed for 2014-15=5000 nos. 2015-16=7000 nos.	proposed for 2014- 15=10250 at 80% survival. 2015-16=3250nos.	plantation are carried out in many places on surface.
бе	Cumulative no .of plants	not proposed.	not submitted to furnish	Though they are doing, but not submitted to the office.
6f	Any other method of rehabilitation	In U/g it is only through back filling through stowing and not other wise.	only through stowing for permanent backfilling.	No chance for surface.
6g	Cost incurred on watch and care during the year	not furnished.	Company is taking care on surface & u/g no such provision, it will be managed from surface.	only from surface and not from u/g.
6h	Compliance on reclamation and rehabilitation by backfilling (i) Voids available for backfilling (Lx B x D	approval in the document, phased manner it is followed.	yes it is followed and the report reced for the 2014-15=5 stopes in hutti mines and 5 stopes for the year 2015-16 respectively.	what is reported by the lessee company.
6i	Compliance on reclamation and rehabilitation by backfilling (ii) Voids filled by waste / tailings	yes in u/g only and not in surface, however, tailings are taking to tailing ponds.	mill tailngs are used for for stopes filling as when required to be filled.	not in surface working.

6j	Compliance on reclamation and rehabilitation by backfilling (iii)Afforestati on on backfilled area		yes only for surface workings.	not for u/g workings.
6k	Compliance on reclamation and rehabilitation by backfilling (iv) Rehabilitation by making water reservoir	water reservoir in surface and not in underground, U/g water is pumped out reqularly to surface for usage in the plant.	u/g water need to be pumped out to surface for the use in beneficiation plant.	yes for use in plant for processing & for other purposes.
61	Compliance on reclamation and rehabilitation by backfilling (v)any other specific means.	nil	nil	nil
6m	Compliance of rehabilitation of waste land within lease (i)afforestation	company has its own plan on this matters.	nothing in u/g such work, but in surface.	nil
6n	Compliance of rehabilitation of waste land within lease (ii)Area rehabilitation (ha)	whatever company feels necessary to do so, they undertake.	yes whatever company discretion in this matter.	yes purely company discretion.
60	Compliance of rehabilitation of waste land within lease (iii)Method of rehabilitation	niln	nil	nil
6p	Compliance of environmental monitoring (core zone and buffer zone)	report to	not submitted.	violation to be issued.
6q 	General remarks of inspecting officers on PMCP compliance and progressive closure operations etc.	Not submitted for the year 2014-15 to know more details.	hence violation is issued.	yes to be appropriate.

Mineral Conservation:

Sl.No.	Item	Propasals	Actual work	Remarks
7a	ROM Mineral dispatch or grade-wise sorting within lease area	produce from the drives,	whatever ore produced from the above places will be sent to surface through skips/ bucket/ and from there it will go to beneficiation plant for processing. waste will be as reject will be sent waste yard for any miscellaneous purposes.	all the materials are hoisted from u/g only and sorted at u/g itself through regular sampling analysis carried out departmentally.
7b	Method of grade- wise mineral sorting i.e. manual or mechanical.	mechanically and analysis of samplings through manual.	mechanical method.	yes mechanically, before that finalises through samplings.
7c	Different grade of mineral sorted out at mines.	waste rock and ROM as ore from above 2g/t and anything found less than that will be taken in the waste side.	ROM will be hoisted to surface and pure waste will be sorted and brought out.	sampling and analysing the same and segrates the ore and the waste.
7d	Any beneficiation process at mines .	yes proposed for beneficiation.	all the ore of ROM is pass through beneficiation, other wise the waste is identified.	there was a proposal to treat the low grade like subgrade with mangalur ore by blending, which is under consideration.
7e	General remarks of inspecting officer on Mineral conservation and beneficiation issues	yes proposals are satisfactory.	for the year 2014-15, it is reported like this, from development 35322t @ 3.5g/t, hosited at 34700t @ 3.51g/t, similarly from the stope is 371186t at 4.40g/t, hoisted 434018t at 3.43g/t. and in total 406508t produced at 4.32g/t. Hoisted 468718t at 3.44g/t. with difference of 0.88g/t is reduced.	0.88g/t is reduced from the production to hoisting is the big questions.

Environment:

Sl.No.	Item	Propasals	Actual work	Remarks

8a	Separate removal and utilization of topsoil (Rule 32)	appliacble,	hoisting of waste rock and the ROM as ore gold.	yes only ROM & waste rock.
d8	Concurrent use or storage of topsoil	not applicable.	nil	nil
8c	Separate dumps for overburden, waste rock, rejects and fines (Rule 33)	proposed for ROM, waste rock	yes only waste rock and the ROM is hoisted from the mine and any ore above 2g/t is treated in the plant for extraction of gold through beneficiation with all care without any waste. with all that, some gold is passed out through mill tailings.	due to out of control from the mill plant, less than 1g/t gold is goes away in the mill tailings.
8d	Use of overburden, waste rock, rejects and fines dumps for restoring the land to its original use	yes some waste rock suitable for back filling in the stoped out area is used and some are hoisted to the surface.	yes some are used and some are hoisted to surface.	yes some wwaste complete black rock, without any ore used for filling in the voids like stopes.
8e	Phased restoration, reclamation and rehabilitation of lands affected by mining operations (Pits, dumps etc)	not applicable in surface, except in underground.	some part of the area is envisaged to restore and other area were left as it is.	yes some of the competent rock, where no support required. Weak area need to be supported.
8f	Baseline information on existence of plantation and additional plantation done (Rule 41)	Not applicable.	care is taken for surface by the department, but u/g nothing.	yes only for surface, it is always takes care by the company.
8g	Survival rate	not applicale.	on surface $70-80\%$ and not in U/g .	nil
8h	Water sprinkling on roads to control airborne dust	not applicable.	nil	nil

8i	General remarks
	of inspecting
	officer on
	aesthetic beauty
	in and around
	mines area

u/g workings are taken care u/g and surface. to maintaimn the aesthetic beauty. similarly in surface

company taking care both

yes company is taking care regularly to maintain the aesthetic beauty in and around and below the underground.

Compliance of Rule 45:

Sl.No.	Item	Propasals	Actual work	Remarks
9a	Status of submission of Monthly and Annual returns	15. Monthly returns are recd	information were furnished to the satisfaction, except in part-part-VI., on production of gold from stope to hoisting varies from 4.40g/t to 3.43g/t.	yes the grade of the gold reported varies from 4.4g/t to 3.43g/t.
9b	Scrutiny of Annual return for information on Mining Engineer, Geologist and Manager	Shri Shanthakumar, Mining engineer cum Mine manager, Dr. P. sanguramath as Geologist in charge.	Shri Shanthakumar, Mining engineer cum Mine manager,present during the inspection & Dr. P. sanguramath as Geologist in charge. In addition to that other geologist and mining engineer were present for the mining operations.	yes other officers were present during the inspections.
9c	Scrutiny of Annual return on land use pattern for area under pits, reclaimed area, dumps etc.	surface rights obtained is 334.18 ha. out	what is reported is corect, since the mining work is mainly concentrated in underground and other processing work and mill tailings are in surface.	yes satisfactory.
9d	Scrutiny of Annual return on afforestation	10250nos of plantation during the year 2014-15 with 80% survival.	yes as reported , same could be seen in the mining area.	yes as it is.

9e Scrutiny of Annual return on rejcets is nil some times very mineral reject generation (Grade and quantity) i.e waste rock). 9f

mineral but in underground it 1g/t ore. is given as 2261.49 meter, taken from cross cuts/ foot wall drives in barren rock(

almost zero grade or negligible less than

complete waste.

Scrutiny of Annual return on is 1134t at ROM stock and/or 1.61g/t, graded ore

35322t at 3.5g/t and hoisting quantity is given as 34700t at 3.51q/t and clossing stock is 1756t at 2.01q/t. similarly from stopes (OS)-145663t at 3.36g/t, the corresponding production is 371186t at 4.40q/t and hoisted production is 434018t at 3.43q/t and closing stock quantity is 82831t at 7.65g/t.

Opening stock the production from stopes and grade and the hoisted quantity and the production was grade is not tallying. Again the closing stock grade is very much high as 7.65g/t.

Violation on this issues to the management/ agent to clarify this issues.

9g	Scrutiny of Annual return on sale value, Ex. Mine price and production cost			the cost was varying from period to period.
9h	Scrutiny of Annual return on fixed assets	the value of fixed asets is given as (Rs.000)1353650, in respect of mine, beneficiation plant, mine, work shop, power, water installation.	as per the company position.	nil
9k	Scrutiny of Annual return on mining machineries	various machineries details furnished separately in annexures for 4 pages.	all the machineries pertains to underground operations.	yes pertains to underground workings are satisfactory.

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

Viola	tion observed	Show couse position		
Rule NO.	Issued on Compliance on	Rule NO.	Issued on Compliance on	
Rule 23E(2)	20/04/2016			
Rule 45(1)	20/04/2016			
Rule 13(1)	20/04/2016			

Date : (C.PARAMESHWARAN)

Indian Bureau of Mines