

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

Check up inspection REPORT

Bangalore regional office

Mine file No : KNT/BLR/FE-201/BNG

Mine code : 30KAR03180

- (i) Name of the Inspecting : **M003**) **G C MEENA**
Officer and ID No.
- (ii) Designation : Regional Controller Mines
- (iii) Accompanying mine :
Official with
Designation
- (iv) Date of Inspection : 15/10/2020
- (v) Prev.inspection date :

PART-I : GENERAL INFORMATION

1. (a) **Mine Name** : **SMIORE ML-2678(OLD2580)**
- (b) **Registration NO.** : **IBM/35/2011**
- (c) Category : A Fully Mechanised
- (d) Type of Working : Opencast
- (e) Postal address :
State : KARNATAKA
District : BELLARY
Village : DEOGIRI ,SB HALLI ,RAM
Taluka : SANDUR
Post office :
Pin Code :
FAX No. : (080) 23613169
E-mail : eps@sandurgroup.com
Phone : (080) 23613166
- (f) Police Station : Sandur
- (g) First opening date : 01/01/1954
- (h) Weekly day of rest : SUN
2. Address for : M/s THE SANDUR MANGANESE & IRON ORES LTD
correspondance : NO.9, BELLARY ROAD, SADASHIVANAGAR,
BANGALORE - 560080
3. (a) Lease Number : KAR1516
- (b) Lease area : 1860.1
- (c) Period of lease : 20
- (d) Date of Expiry : 31/12/2033
4. Mineral worked : MANGANESE ORE Associated
IRON ORE Main

5. Name and Address of the

Lessee : SANDUR MANGANESE & IRON ORES LTD
 DEOGIRI (PO)-583 112 SANDUR
 BELLARY KARNATAKA
 Phone:08395-271025/28/29/40
 FAX :08395-271066

Owner : RAJNISH SINGH
 THE SANDUR MANGANESE & IRON
 ORE LTD DEOGIRI POST,
 SANDUR TALUKA BELLARY
 KARNATAKA
 Phone:
 FAX : (08395) 271066

Agent : Md. Abdul Saleem
 THE SANDUR MANGANESE & IRON
 ORES LT DEOGIRI POST,
 SANDUR TALUKA BELLARY
 KARNATAKA
 Phone: (08395) 271025
 FAX : (08395) 271066

Mining Engineer

Name : SUNIL KUMAR GS,Full Time
 Qualification : B.E.MINING
 Appointment/ : 01/01/2018
 Termination date

Geologist

Name : SHRIDHAR P. HEGDE,Full Time
 Qualification : M. Sc. (Geology)
 Appointment/ : 01/01/2018
 Termination date

Manager

Name : V.JAYAPRAKASH
 Qualification : Dip. in ME
 Appointment/ :
 Termination date

6. Date of approval of Mining	:	MP modif under MCR 1960	01/09/2015
Plan/Scheme of Mining	:	MP modif under MCR 1960	19/08/2016
	:	MP review under 17(1) MCR 2016	07/12/2017
	:	MP review under 17(1) MCR 2016	05/10/2018

PART - II : OBSERVATION/COMMENTS OF INSPECTING OFFICERS

Exploration :

Sl.No.	Item	Proposals	Actual work	Remarks
1a	Backlog of previous year	No Proposal	No Backlog	129 DTH Confirmatory holes amounting to total of 6262 Mtrs in FY 2018-19
1b	Exploration over lease area for geological axis 1 or 2	25 DTH Holes amounting to total of 750 mts proposed at G1 level.	46 DTH Holes drilled at 50 Mtrs grid interval amounting to total of 1277 mts.	Entire Mineralized area has been explored under G1 stage
1c	Exploration Agencies and Expenditure in lakh rupees during the year	Departmental & External 1.00 lakhs	Departmental & External 3.52 lakhs	Drill machine was hired & exploration carried out by Department
1d	Balance area to be explored to bring Geological axis in 1 or 2	No Proposal	Not applicable	
1e	Balance reserve as on 01/04/20	--	Mn. Ore: ?12725687 Tons, Iron Ore: ? 98483404 Tons	As per AR submitted for FY 2019-20
1f	General remarks of inspecting officers on geology, exploration etc			

Development :

Sl.No.	Item	Proposals	Actual work	Remarks
--------	------	-----------	-------------	---------

2a	Location of development w.r.t.lease area	Development proposal locations for Manganese ore: JLK: N 1659380 TO 1659645 E 675375 TO 675714, KH: N 1661620 TO 1661940 E 664300 TO 664650, YRD: N 1658388 TO 1658670 E 674306 TO 674593, RMK: N 1657718 TO 1658113 E 673543 TO 674177, CBG: N 1657234 TO 1657810 E 670860 TO 671658, SK: N 1657435 TO 1658253 E 669942 TO 670813, KMK(E): N 1658259 TO 1658540 E 669180 TO 669835, KMK: N 1658329 TO 1658769 E 668413 TO 668761, NK: N 1658639 TO 1658919 E 667172 TO 667667, KPTS: N 1658580 TO 1658920 E 665895	Actual development locations for Manganese ore: JLK: N 1659380 TO 1659645 E 675375 TO 675714, YRD: N 1658388 TO 1658670 E 674306 TO 674593, RMK: N 1657718 TO 1658113 E 673543 TO 674177, CBG: N 1657234 TO 1657810 E 670860 TO 671658, SK: N 1657435 TO 1658253 E 669942 TO 670813, KMK(E): N 1658259 TO 1658540 E 669180 TO 669835, KMK: N 1658329 TO 1658769 E 668413 TO 668761, NK: N 1658639 TO 1658919 E 667172 TO 667667, KPTS: N 1658580 TO 1658920 E 665895 Iron Pit: (KTIO-A): N 1661536 TO 166	Top soil: 1 Bench, Over burden: 2 to 4 benches, Mineral: 8 to 9 benches
2b	Separate benches in topsoil, overburden and minerals (Rule 15)	Separate benches proposed in topsoil, overburden and mineral	Separate benches maintained in topsoil, overburden and mineral	Top soil: 1 Bench, Over burden: 2 to 4 benches, Mineral: 8 to 9 benches
2c	Stripping ratio or ore to OB ratio	Mn Ore: 7.39 Fe Ore: 0.34	Mn Ore: 12.42 Fe Ore: 0.37	?The nature of occurrence of Mn ore is irregular
2d	Quantity of topsoil generation in m3	Mn: 3600 Tons, Fe: 82050 Tons	Mn: 2000 Tons, Fe: 5000 Tons	Top Soil is utilised for plantaion.

2e	Quantity of overburden generation in m3	Mn Pit: 4559716 Tons, Fe pit: 1463920 Tons	Mn Pit: 4628116 Tons, Fe pit: 856607 Tons.	The difference in proposal and achieved quantity is because mining plan was prepared for getting enhancement in EC quantity from MOEF for Iron ore from 1.60 MTPA to 3.85 MTPA. Since, EC enhancement is still awaited. Iron ore production is restricted to 1.60 MTPA only. Proportionately the development is carried out.
2f	General remarks of inspecting officers on development of pit w.r.t. type of deposit etc			

Exploitation:

Sl.No.	Item	Propasals	Actual work	Remarks
3a	Number of pit proposed for production	Manganese ore:12 pits, Iron ore: 17 pits	Working in Manganese ore 12 pits and Iron ore 03 pits	
3b	Quantity of ROM mineral production proposed	Mn Ore: 254000 t Fe Ore: 1600000 t	Mn Ore: 253362.24 t Fe Ore: 1590002 t	
3c	Recovery of salable/usable mineral from ROM production	Mn Ore: 41% Fe Ore: 75%	Mn Ore: 56% Fe Ore: 69%	Manual sorting of salable Mn ore from ROM after dry screening and Mechanized Crushing and Screening for Iron ore
3d	Quantity of mineral reject generation	Mn Ore: 362855 T Fe Ore: 542060 T	Mn Ore: 119140 T Fe Ore: 706005 T	Mineral Reject of Manganese and Iron ores are stacked separately.

3e	Grade of mineral rejects generation and threshold value declared.	10 to 22% Mn 45 to 55% Fe & 35 to 45% Fe	10 to 22% Mn 45 to 55% Fe & Fe	
3f	Quantity of sub grade mineral generation.	No proposal	NIL	
3g	Grade of sub grade mineral generation	No proposal	NIL	
3h	Manual / Mechanised method adopted for segregating from ROM	Manual method proposed for segregating from Manganese ROM and Mechanized method proposed for Iron ROM	Manual method adopted for segregating from Manganese ROM and Mechanized method adopted for Iron ROM	NO CHANGE
3i	Any analysis or beneficiation study proposed and carried out for sub grade mineral and rejects.	No proposal	No such beneficiation study carried out for sub-grade and mineral reject	Dry crushing and screening for Mn and Iron ores
3j	Provision of drilling and blasting in mineral benches	Provision of drilling & blasting made	Drilling & Blasting is carried out in combination with Ammonium Nitrate, Slurry explosive and Nonel detonators.	100 mm dia, Spacing :4 Mtrs & Burden:3 Mtrs and height:8.25 Mtrs
3k	Provision of mining machineries in mineral benches	Proposed mining machineries Excavator-60 No's, Wheel loaders:54 No's, Trucks-377 No's, Deep hole Drill-32 No's, Jack hammer-18 No's Water Tanker-44 No's	Mining machineries used Excavator-39 No's, Wheel loaders-32 No's, Trucks-196 No's, Jack hammer-2 No's Water Tanker-29 No's	

3l	Whether height of benches in overburden and mineral suitable for method of mining proposed in MP/SOM	Proposed Bench height & Bench width - 7.5 m	Actual Bench height - maximum 7.5 m Bench width - minimum 7.5-8 m
3m	Total area covered under excavation/pits	496.33 ha in the plan period	447.76 ha
3n	Ore to OB ratio for the pit/mine during the year.	Proposed Mn Ore: 7.39 and Fe Ore: 0.34	Actual Mn Ore: 12.42 & Fe Ore: 0.37
3o	Total area put in use under different heads at the end of year	Area put to use in plan period Area under mining: 496.33 ha, Storage for top soil-1.00 ha, Waste dump site-385.02 ha, Mineral storage-143.23, Infrastructure (Workshop, administrative buildings etc-24.10 ha, Roads-35.16 ha, Tailing pond-2.00 ha, Mineral separation plant-2.00 ha, Township Area-25.52 ha	Area under mining: 447.76 ha, Reclaimed/Rehabilitated-131.26 ha, Waste disposal-296.54 ha, Occupied by plant, buildings, residential, welfare buildings and roads-78.28 ha, Afforestation-82.84, Other Purpose-720.09 ha, Work Done Under Progressive mine closure plan during the year-0.800 ha.

3p	Production of ROM mineral during the last five year period as applicable	Mn Ore- (in tonnes) 2015-16 180000 2016-17 254000 2017-18 254000 2018-19 254000 2019-20 254000	Mn Ore- (in tonnes) 2015-16 144209 2016-17 215254 2017-18 252445 2018-19 253023.5 2019-20 253362.24	Actual production of Manganese & Iron ores is within the proposed limits.
		Iron Ore- (in tonnes) 2015-16 740000 2016-17 1600000 2017-18 1600000 2018-19 1600000 2019-20 1600000	Iron Ore- (in tonnes) 2015-16 739744 2016-17 1149899 2017-18 1579949 2018-19 1581000 2019-20 1590002	
3q	General remarks 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 dumps are proposed for top soil, OB and mineral reject	Separate dumps are maintained for top soil, OB and mineral reject	Top soil, OB and mineral reject are stacked separately.

4b	Location of topsoil, OB and mineral reject dumps	Proposed OB Locations for Manganese Pits: JLK: N 1659105 TO 1659457 E 675549 TO 675981 N 1658481 TO 1658828 E 674533 TO 675075, YRD: N 1658481 TO 1658828 E 674533 TO 675075, YRD: N 1658481 TO 1658828 E 674533 TO 675075 N 1659105 TO 1659457 E 675549 TO 675981, RMK: N 1657336 TO 1658082 E 672796 TO 673435, CBG: N 1657010 TO 1657565 E 670175 TO 672002, N 1657587 TO 1658132 E 670303 TO 671121, SK: 1657200 TO 1658400 E 668820 TO 670000 N 1657587 TO 1658132 E 670303 TO 671121 N 1657010 TO 1657565 E 670175 TO 672002, KMK(E): N 1657200 TO 1658400	Actual OB Locations for Manganese Pits: JLK: N 1659105 TO 1659457 E 675549 TO 675981 N 1658481 TO 1658828 E 674533 TO 675075, YRD: N 1658481 TO 1658828 E 674533 TO 675075 N 1659105 TO 1659457 E 675549 TO 675981, RMK: N 1657336 TO 1658082 E 672796 TO 673435, CBG: N 1657010 TO 1657565 E 670175 TO 672002, N 1657587 TO 1658132 E 670303 TO 671121, SK: 1657200 TO 1658400 E 668820 TO 670000 N 1657587 TO 1658132 E 670303 TO 671121 N 1657010 TO 1657565 E 670175 TO 672002, KMK(E): N 1657200 TO 1658400	
4c	Number of dumps within lease area and outside of lease area	Within lease area-16 OB dumps Outside mining lease area-Nil	Within lease area-16 OB dumps Outside mining lease area-Nil	Total Numbers of dumps with in lease area are 16

4d	Location of dumps w.r.t. ultimate pit limit (Rule 16)	Waste Dumping in Manganese pits: JLK, YRD, RMK, CBG, SK, KMK(E), KMK, NK, KPTS Iron pits: KTIO (A & B), KVHIO, KH, AMK, RNP, KVH(BG), JLK. Back filling in JLK pit	Waste Dumping in Manganese pits: JLK, YRD, RMK, CBG, SK, KMK(E), KMK, NK, KPTS Iron pits: KTIO (A & B), KVHIO & Back filling in JLK pit.	Minerals from the pits are exhausted and back filled.
4e	Number of active and alive dumps.	16	16	On the date of inspection back filling was in progress in Jaldikolla
4f	Number of dead dumps.	No Proposal	NIL	Total Numbers of Dead dumps-70
4g	Number of dumps established.	Proposed as per the approved R&R Plan.	NIL	Stabilized by plantation by coir mat and plantation.
4h	Whether Retaining wall or garland drain all along dumps are there.	Retaining wall and garland drain proposed all along the dumps.	Retaining wall and garland drain constructed and maintained all along the dumps.	
4i	Length of Retaining wall or garland drain all along dumps	Retaining Wall - 350 mtrs Garland Drain - 210 mtrs	Retaining Wall -1024 M3 Garland Drain - 330 M3	Total TW 51086 Cum & garland drain 44311 Cum
4j	Number of settling ponds	No Proposal	NIL	50 No's of settling ponds constructed in the previous years.
4k	Specific comments of inspecting officer on waste dump management			

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 back filling after extracting the mineral fully	Mineral extracted fully before starting back filling	
5b	Area under backfilling of mined out area	3.52 ha during FY 2019-20	1.60 ha in JLK pit after complete extraction of ore	
5c	Concurrent use of topsoil for restoration or rehabilitation of mineral out area (Rule 32)	No proposal	Top soil generated is stacked separately	Top soil will be utilized for plantation in the plan period
5d	Total area fully reclaimed and rehabilitated	No proposal	5.00 ha (KTIO A-4.20 ha, RMK-0.8 ha.)	Reclamation done by afforestation
5e	General remarks of inspecting officers on backfilling and reclamation etc.			

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).	To be submitted by 1st July of every year	Annual report on PMCP submitted on 30.06.2020	
6b	Area available for rehabilitation (ha) .	20.00 ha available	22.22 ha	
6c	afforestation done (ha).	No Proposal	NIL	
6d	No. of saplings planted during the year	No Proposal	NIL	
6e	Cumulative no .of plants	50000 No's saplings proposed	50349 No's saplings are done	
6f	Any other method of rehabilitation	Proposed as per approved R & R plan	Coir matting and gap plantation on dead dumps	
6g	Cost incurred on watch and care during the year	Rs. 5 Lakh	Rs. 27.57 Lakh	

6h	Compliance on reclamation and rehabilitation by backfilling (i) Voids available for backfilling (Lx B x D	Backfilling proposed in JLK pit after complete excavation of ore Proposed Backfilling (L X B X D) JLK=120 m X 10 m X 17.96 m	Backfilling carried out in JLK pit as per plan Actual Backfilling (L X B X D) JLK=120 m X 10 m X 17.96 m
6i	Compliance on reclamation and rehabilitation by backfilling (ii) Voids filled by waste / tailings	3.52 Ha.	0.1 Ha.
6j	Compliance on reclamation and rehabilitation by backfilling (iii)Afforestation on backfilled area	-	Active backfilling is in progress. There is no chance for afforestation at this stage.
6k	Compliance on reclamation and rehabilitation by backfilling (iv) Rehabilitation by making water reservoir	No proposal	NIL
6l	Compliance on reclamation and rehabilitation by backfilling (v)any other specific means.	No proposal	NIL
6m	Compliance of rehabilitation of waste land within lease (i)afforestation	No proposal	NIL
6n	Compliance of rehabilitation of waste land within lease (ii)Area rehabilitation (ha)	No proposal	NIL
6o	Compliance of rehabilitation of waste land within lease (iii)Method of rehabilitation	Plantation	Plantation

6p	Compliance of environmental monitoring (core zone and buffer zone)	Environmental monitoring proposed in Core and Buffer Zone	Environmental monitoring has been carried out for all the 4 seasons for Ambient air quality (core zone- 4 locations & buffer zone- 6 locations), water quality (surface water - 5 locations & Ground water- 5 locations), Noise quality (core zone - 6 location & buffer zone - 6 locations)	All the environmental parameters were observed to be within the permissible limit
6q	General remarks of inspecting officers on PMCP compliance and progressive closure operations etc.			

Mineral Conservation:

Sl.No.	Item	Propasals	Actual work	Remarks
7a	ROM Mineral dispatch or grade-wise sorting within lease area	Grade wise sorting proposed with in Lease area	Grade wise sorting done manually with in Lease area for Mn ore and Grade wise sorting done mechanically with in Lease area for Iron ore	
7b	Method of grade-wise mineral sorting i.e. manual or mechanical.	Manual for Mn Ore and Mechanical for Iron ore	Manual for Mn Ore and Mechanical for Iron ore is done	
7c	Different grade of mineral sorted out at mines.	24-26, 26-28, 28-30, 30-32 & 32-34% for Mn ore and 55-58, 58-60, 60-62, 62-65 & 65+ for Iron ore	24-26, 26-28, 28-30, 30-32 & 32-34% for Mn ore and 55-58, 58-60, 60-62, 62-65 & 65+ for Iron ore	Grade wise sorting done manually for Mn ore
7d	Any beneficiation process at mines .	No proposal	No such beneficiation process carried out in the mines	Crushing, dry screening and manual separation of Mn ore from ROM

7e General remarks of inspecting officer on Mineral conservation and beneficiation issues

Environment:

Sl.No.	Item	Propasals	Actual work	Remarks
8a	Separate removal and utilization of topsoil (Rule 32)	Separate removal of Topsoil proposed	Topsoil removed from Manganese Pits CBG, NK and Iron ore pits KTIO-A & B, KVHIO.	Stacked separately
8b	Concurrent use or storage of topsoil	No proposal	Top soil stacked separately	Will be u Used for Plantation and rolling of coir mat over dump slope
8c	Separate dumps for overburden, waste rock, rejects and fines (Rule 33)	Separate dumps for overburden and Mineral rejects proposed	Separate dumps for overburden and Mineral rejects maintained	Waste and Mineral rejects are stacked separately
8d	Use of overburden, waste rock, rejects and fines dumps for restoring the land to its original use	OB and waste proposed for backfilling	Concurrent Backfilling is in progress in JLK	
8e	Phased restoration, reclamation and rehabilitation of lands affected by mining operations (Pits, dumps etc)	Proposed during Final Mine Closure plan	Phased reclamation and rehabilitation of in active dumps in progress	
8f	Baseline information on existence of plantation and additional plantation done (Rule 41)	Baseline information on existence of plantation available	Within ML area 50245. No's of saplings planted @ 70% survival	2584915No's of saplings are done till 31st March 2020

8g	Survival rate	65%	70%	
8h	Water sprinkling on roads to control airborne dust	Water sprinkling proposed on haul roads to control airborne dust	Water sprinkling is done regularly on haul roads and mine faces to suppress the dust	29 No's of water tankers each of 12000 Ltrs capacity is deployed
8i	General remarks of inspecting officer on aesthetic beauty in and around mines area			

Compliance of Rule 45:

Sl.No.	Item	Propasals	Actual work	Remarks
9a	Status of submission of Monthly and Annual returns	M.R. Submitted upto September-20 A.R. submitted upto FY 2019-20		Annual return submitted on 30.06.2020
9b	Scrutiny of Annual return for information on Mining Engineer, Geologist and Manager	Manager Mining- Shri.Prakash Babu Shri.Bachalapp a. K, Shri.Karthika. S Mining Engineer- Shri.Sunil Kumar G S, Geologist- Shri. Shridhar P Hegde	Manager Mining- Shri.Prakash Babu Shri.Bachalappa.K, Shri.Karthika. S Mining Engineer- Shri.Sunil Kumar G S, Geologist-Shri. Shridhar P Hegde	

9c	Scrutiny of Annual return on land use pattern for area under pits, reclaimed area, dumps etc.	Area under mining: 447.76 ha, Reclaimed/Rehabilitated-131.26 ha, Waste disposal-296.54 ha, Occupied by plant, buildings, residential, welfare buildings and roads-78.28 ha, Afforestation-82.84, Other Purpose-720.09 ha, Work Done Under Progressive mine closure plan during the year-0.800 ha.	Area under mining: 447.76 ha, Reclaimed/Rehabilitated-131.26 ha, Waste disposal-296.54 ha, Occupied by plant, buildings, residential, welfare buildings and roads-78.28 ha, Afforestation-82.84, Other Purpose-720.09 ha, Work Done Under Progressive mine closure plan during the year-0.800 ha.
9d	Scrutiny of Annual return on afforestation	50349 No's saplings are done	50349 No's saplings are done
9e	Scrutiny of Annual return on mineral reject generation (Grade and quantity)	Mn Ore: 119140 (10-20% Mn) Tonnes Fe Ore: 706005 (35-55% Fe) Tonnes	Mn Ore: 119140 (10-20% Mn) Tonnes Fe Ore: 706005 (35-55% Fe) Tonnes
9f	Scrutiny of Annual return on ROM stock and/or graded ore	Iron ore: ROM; Opening stock-12141.34 Tonnes, Production-1590002 Tonnes, Closing stock-12119 Tonnes	Iron ore: ROM; Opening stock-12141.34 Tonnes, Production-1590002 Tonnes, Closing stock-12119 Tonnes

9g	Scrutiny of Annual return on sale value, Ex. Mine price and production cost	Manganese: Cost of Production- Rs 4900 per Tons, sale value- 6572.58 Rs/T and Ex. Mine price- 8080.25 Rs/T. Iron ore: Cost of Production- Rs 346 per Tons, sale value- 2067.94 Rs/T and Ex. Mine price- 1691Rs/T.	Manganese: Cost of Production- Rs 4900 per Tons, sale value-6572.58 Rs/T and Ex. Mine price- 8080.25 Rs/T. Iron ore: Cost of Production- Rs 346 per Tons, sale value-2067.94 Rs/T and Ex. Mine price- 1691Rs/T.
9h	Scrutiny of Annual return on fixed assets	--	--
9k	Scrutiny of Annual return on mining machineries	Excavator-39 No's, Wheel loaders-32 No's, Trucks-196 No's, Jack hammer-2 No's Water Tanker-29 No's	Excavator-39 No's, Wheel loaders-32 No's, Trucks-196 No's, Jack hammer-2 No's Water Tanker-29 No's

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
MCDR17	Rule 11(1)	11/11/2020			
MCDR17	Rule 35(2)	11/11/2020			

Date :

(G C MEENA)

Indian Bureau of Mines